

MAYFIELD IRONWORKS WADHURST PARK ESTATE EAST SUSSEX

[TQ 59296 28132]
[SAM LIST NO 1002229]

PART OF WADHURST PARK
HIGHER LEVEL STEWARDSHIP AGREEMENT
[No: AG00472794]

CORE MONUMENT RECORD & TOPOGRAPHIC SURVEY OF THE IRONWORKS SITE



View SE down the valley towards Mayfield Ironworks from the old lane

Final Report

Undertaken on behalf of

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**Mayfield Ironworks,
near Mayfield, East Sussex
[Centred TQ 59296 28132]**

Core Monument Record

ID/REF NO: EH Level 1 and Level 3 Survey CPTS.
Site: Mayfield Iron Furnace.
Name: Nr Mayfield, East Sussex.
Grid Reference: TQ 59296 28132.
Status Heritage: Scheduled SAM List No. 1002229.
HER MES 4611 TQ 52 NE 10 C16 Furnace.
Status other: Ancient & secondary woodland, rough pasture.
County: East Sussex.
District/s: Wealden.
Parish/es: Mayfield.
Owner: Wadhurst Park Estate [contact Fraser Elliot Estate Manager.
Fraser.Elliot@wadhurstpark.com]
EH Site Type Iron Works, iron furnace site, forge site pond bays, hammer pond, pen pond, leat, managers house cannon boring mill, iron slag heaps and associated features.
Description: The site and earthworks of Mayfield Ironworks belonging to Sir Thomas Gresham in operation in C16 and may be site of an earlier medieval iron works belonging to Archbishop of Canterbury. Comprises at least two pond bays, a leat, site of furnace, forge and cannon boring mill, with slag heaps, site of overseers or managers cottage and other unidentified mounds, ditches and depressions.
Date: Medieval & Post-medieval [AD 1086-AD1800].
Surveyor/Recorder: Dr Nicola R. Bannister [Ashenden Farm, Bell Lane, Biddenden, Kent TN27 8LD] & Canterbury Archaeological Trust [92a Broad Street, Canterbury, Kent, CT1 2LU].
Event: Topographical Survey 2014 [EH Level 1 and Level 3] for Natural England Higher Level Stewardship Agreement. Surveys undertaken by Canterbury Archaeological Trust Ltd and Dr Nicola Bannister
Ground Cover: Bluebells, Bracken, Brambles, scrub.
Geology: Tunbridge Wells Sand Formation, Wadhurst Clay and Ashdown Sandstone.
Condition: Good to Excellent.

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Thanks are also extended to Fraser Elliot of Wadhurst Park Estate for facilitating the survey and to Crispin Jarman [Senior Surveyor] of the Canterbury Archaeological Trust for undertaking the Level 3 Survey.

The author is indebted to Brian Herbert of Wealden Iron Research Group for his detail search for the site of the forge and for his advice on the interpretation of the earthworks. A fulsome appreciation is also extended to Tim Cornish [Local Historian on Mayfield] for his contributions to the historical context of the ironworks and the history of Mayfield Park.

Appreciation is also extended to the;-

Archivists at The Keep – East Sussex Record Office and for permission to reproduce the Estate Map of Old Palace Farm [ERSO AMS 5831-3] and the extract from the Tithe Map of Mayfield [TDE 1330007];

Archivists at The Kent History and Library Centre, Maidstone;

Ann Clark, Jo Barnes and Jane Robertson of Natural England;

And finally to Angus Foad for his help and company with the field work for the Level 1 Survey and Assessment.

PERIOD TABLE

Description	Archaeological Period	From	To
Hunting societies	Upper Palaeolithic	30,000	10,000 BC
Hunter-gather societies	Mesolithic	10,000-8,000	4,000-3,500 BC
The first agriculturalists	Neolithic	3,500	2,100 BC
Beginning of metal working in bronze	Bronze Age	2,100	600 BC
Beginning of metal working in iron	Iron Age	600 BC	AD 43
	Romano-British	AD 43	AD 410
	Anglo-Saxons [or Early Medieval]	AD 410	1066
	Medieval	1066	1540
	Post-medieval	1540	1800
	Early post-medieval	1540	1700
	Late post-medieval	1700	1800
	Modern	1800	1900
	Post-modern	1900	Present

1. Introduction

Mayfield Iron Furnace lies to the north east of Mayfield Church at the junction of two streams which flow into a tributary of the River Rother. It is a complex site comprising numerous earthworks relating to the production of iron and cannon in the 16th century. It is also possible that medieval iron works were operating in Mayfield and evidence of Roman bloomeries have been found further up stream in the valleys. Mayfield Furnace is scheduled (Scheduled SAM List No. 1002229.) under the Ancient Monuments and Archaeological Areas Act 1979. The scheduled site comprises the main iron working area [TQ59296 28132] together with a (upper) pond bay further upstream [TQ 58967 28276]. See Figure 1 below for the boundaries of the scheduled area.

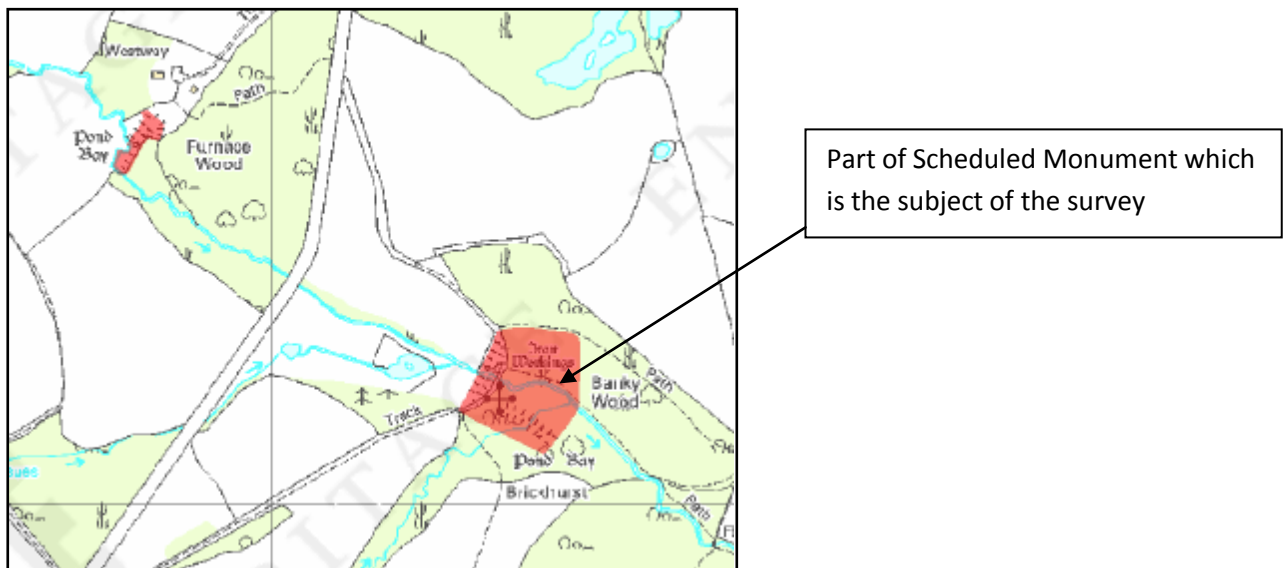


Figure 1. Scheduled Site

This report has been prepared by Nicola Bannister (Independent Landscape Archaeologist) and Crispin Jarman (Canterbury Archaeological Trust Ltd) as part of an English Heritage Level 1 and Level 3 survey¹ of the scheduled monument together with an assessment of its setting, as part of a Natural England Higher Level Stewardship Agreement for the Wadhurst Park Estate. See Survey Brief.² Contributions by Brian Herbert of the Wealden Iron Research Group [WIRG] and Tim Cornish, local historian, have also been included.

1.1. Physical Description

Mayfield Furnace lies in a small valley on a tributary stream of the River Rother. Two smaller streams flow in from the south west and downstream another stream joins the main one from the north by Pennybridge Farm. The valleys sides vary from gently sloping to fairly steep. To the south west is the ridge top settlement of Mayfield, a medieval market village.

¹ English Heritage 2007. Understanding the Archaeology of Landscapes. A guide to good recording practice.

² Clark, A. 2013. Brief for Topographic Survey of the Scheduled Ancient Monument Record [List No. 1002229], relating to Wadhurst Park Agreement.

At the south west end of the old road is Old Place and Old Palace Farm. These formed part of the Archbishop of Canterbury's estate in Mayfield and lie within the former medieval deer park of the Manor of Mayfield. The historic character of the area is of old meadows and pasture 'assart' fields on the more gently sloping ground with woodland in the stream valleys or gills and on the steeper sloping ground such as Banky Wood.

1.1.1. Geology.

The under-lying geology comprises Ashdown Formation of the Hastings Beds which make up the Wealden Series of sedimentary deposits. *Ashdown Sand consists of fine-grained, silty sandstones and siltstones with subordinate amounts of Shale and mudstone.... The sandstones are usually buff-coloured and are massive or thickly bedded, cross bedding being a common feature in the more massive outcrops.*³ On the higher ground away from the streams are beds of Wadhurst Clay, where the source of the clay ironstone is found. The ironstone occurs in nodules and tabular masses and the most important and consistent ironstone horizon occurs at the base of the Wadhurst Clay formation.⁴

1.1.2. Soils

The soils comprise the Curtisden formation which develops over Cretaceous and Jurassic Siltstone and Sandstones. They are described as:-

*Silty soils over siltstone with slowly permeable subsoils and slight seasonal water-logging. Some similar well drained soils. Some well drained coarse loamy soils over sandstone. Slumping locally.*⁵

1.1.3. Vegetation

A well worn path runs over the main pond bay, but downstream the area of the furnace and the leat have recently been cleared of tree and scrub growth. The area was further trimmed and cleared in order to facilitate the Level 3 Survey. Further downstream the open area gives way to alder and hazel coppice. On the north east side is Banky Wood an ancient site which has been planted to conifers. This is currently being cleared as a part of the Woodland Grant PAWS restoration programme. To the south west is Vicarage Wood an ancient site comprising ash, hazel, oak and beech, with bramble and bluebell understory. The adjacent fields comprise semi-improved or improved permanent pasture. On the higher more level ground pasture gives way to arable. On the Wadhurst Park Estate lands, the pasture fields are being managed as unimproved pasture and with arable reversion to wild flower meadows. Figure 2 (page 9) shows the woodland cover extending across the ironworks site together with the clearance of conifers in Banky Wood

³ Gallois, R.W. and Edmunds, F.H. 1965. The Wealden District (4th ed.) London HMSO p24.

⁴ Gallois, R.W. and Edmunds, F.H. 1965. The Wealden District (4th ed.) London HMSO p26.

⁵ Soils Survey of England and Wales 1983. Soils Survey Sheet 6 the South-East of England.

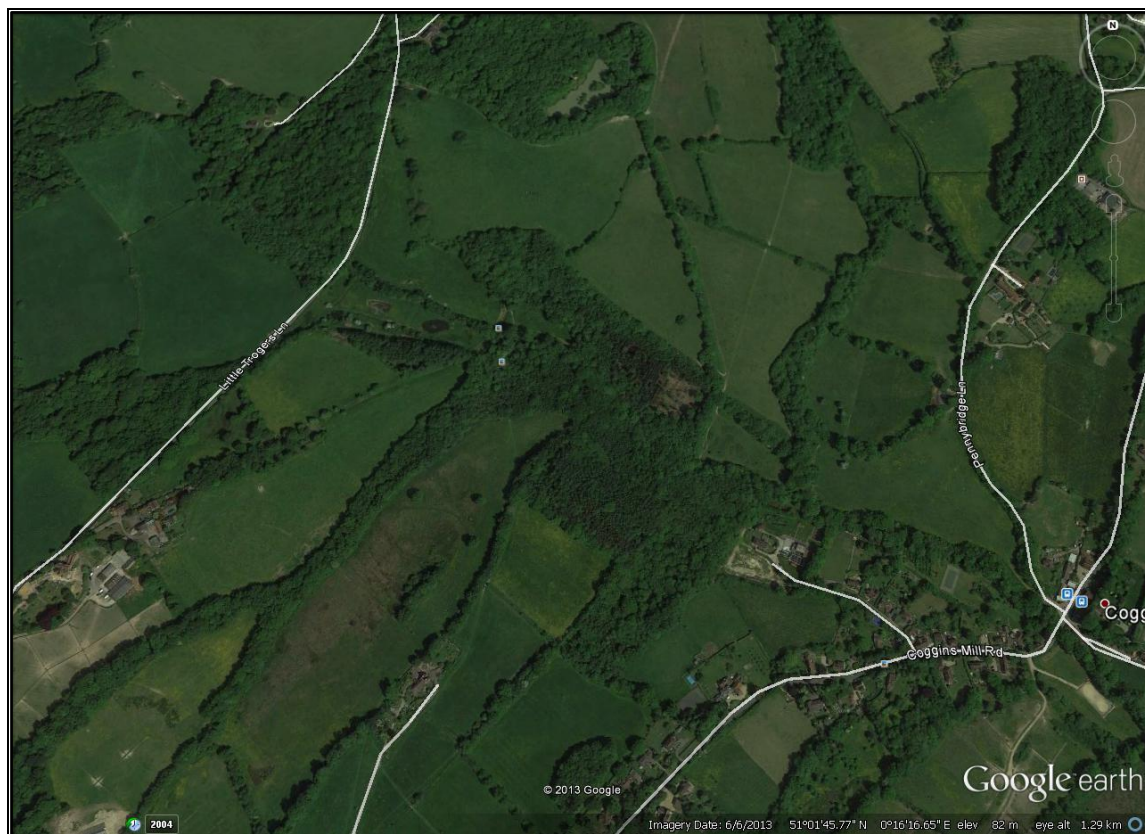


Figure 2. Extract from Google-earth

1.2. Designations

As already stated Mayfield Furnace is scheduled (SAM List No. 1002229). The record is generated from an old county number (OCN) scheduling record. As these are an old record English Heritage does not have the information on the site held electronically. The site is recorded in the English Heritage 2012 Risk Register as: *Risk Assessment* 'Medium' with an *Overall condition* of 'Generally satisfactory but with significant problems' and a *Condition Trend* of 'Improving' with a *Principal vulnerability* being 'Scrub/tree growth'.

A public footpath follows the line of the old road to Mayfield which once crossed the lower pond bay. The 'new' road constructed c. 1831 follows a line across the middle pond bay which is now Trodger's Lane. This footpath runs from Trodgers Lane by Furnace Wood south east to the pond bay and then south west to Old Place. The Wadhurst Park Estate has erected a detailed information board about the furnace site on the edge of the path this point. The path itself does not belong to the Estate. At the pond bay a branch runs east to Coggins Mill following the stream. Before Coggins Mill, at the junction with the edge of Vicarage Wood and footpath running north-south crosses it. This latter footpath links Mayfield to the south with the hamlet of Tidebrook to the north. Further south west along the old road another branch runs south to Glebe Farm. Thus the whole site of Mayfield Furnace is well served with rights of way, making it easy for members of the public to appreciate the site and its wider landscape context.

The Banky Wood which lies on the east side of the site is designated as a PAWS site [plantations on ancient (woodland) sites]. To the west is Vicarage Wood which is designated as ancient semi-natural woodland on the revised ancient woodland inventory.⁶ This wood was once much larger, extending south west towards Glebe Farm.

The whole of the furnace and forge site lies within the East Sussex Historic Environment Record [HER] Archaeological Notification Area.

1.3. Previous Studies

There have been several examinations of the Mayfield Furnace site over the years. Summarised below are the key ones.

1.3.1. Wealden Iron Research Group [WIRG]

The main data entry can be found on <http://www.wirgdata.org/searchsites2.cgi>. and in Cleere and Crossley 1995. [See Appendix I]. The site was surveyed in the winter of 1980/81 by Peter Leach and the site of the boring mill with its pond bay and pen pond was recorded.⁷ The map of Mayfield Place Farm was studied in detail by Anne Dalton and the water network of pond bays and pen ponds was identified.⁸ In February 1981 Mayfield Furnace was also examined by D.M Talbot for the site of a forge. The leat was examined downstream from the main pond together with possible slag and forge remains in the stream.⁹

Evidently in 1979 a clause in a felling licence for felling trees and coppice safe-guarded the boring mill site.

1.3.2. Local Researches

Mr Tim Cornish is a local historian living in Mayfield who has and is currently researching the history of Mayfield. Mr Cornish has extensive knowledge of the archives and has kindly assisted with the early history of the site to which the author is indebted.

1.3.3. Furnace Wood Archaeological Assessment

In 2012, the owner of Furnace Wood Mr Andrew Groombridge asked the author to undertake a survey of the heritage features within the wood as part of a Forestry Commission England Woodland Grant Scheme [EWGS] agreement ahead of planned woodland works..¹⁰ The middle pen pond lies within this woodland and at the northern end it is bounded by the scheduled upper pond bay which divided the middle pond with the upper pond as shown on the C17 map of Mayfield Place Farm.¹¹

⁶ Westaway, S. 2006. Weald Ancient Woodland Survey. A revision of the Ancient Woodland Inventory for Wealden District, East Sussex.

⁷ WIRG 1982. May field Boring Mill (TQ 593281) Bulletin 2nd Series p 10.

⁸ Ibid p10; ESRO AMS 5831-3; Sussex Record Society Map catalogue p 38

⁹ Unpublished field notes from WIRG (pers.comm. Jeremy Hodgkinson)

¹⁰ Bannister, N.R. 2012. Furnace Wood Archaeological Assessment Unpublished report on behalf Mr A. Groombridge as part of FC EWGS Agreement.

¹¹ ESRO AMS 5831-3

The pen pond was bounded along its edges by wood banks and since the pond had been emptied there was significant down-slope slippage of the eastern valley-sides. Subsequent quarrying had taken place along the face of the exposed bed rock. Although the scheduled upper pond bay lay outside of the ownership, the feature was examined. It is covered by over-stood coppice and shows erosion by burrowing animals. The breach to the pond lies at the south west end (possibly where the over spill was located). Upstream from the bay the site of the pond now lies in pasture.

1.3.4. HER/SM Reports

Mayfield Furnace site was also visited by surveyors updating the HER and SAM reports. [See Appendix II]. As part of the archiving of this Level 1 and Level 3 survey a full report will be forwarded to the HER and form part of the HER entry for MES4611 TQ 52 NE 10.

The present boundary of the SAM only includes the main centre of the industry together with one pond bay upstream on the edge of Furnace Wood. It does not include the associated features within the wider landscape. [See Figure 1 on page 7].

1.4. Method of Topographical Survey

The results of the topographical survey have been a collaboration between Nicola Bannister a landscape archaeologist with a special interest in woodland archaeology and Crispin Jarman senior surveyor at CAT. Major contributions have been made by Tim Cornish a local historian with a research interest in the history of Mayfield and Brian Herbert a long-standing member of WIRG and experienced in the history of the Wealden iron working industry. The Level 1 survey took two fields days to complete, the Level 3 also two field days. A meeting was held between the four named above, Fraser Elliot of Wadhurst Park and Ann Clark of NE to discuss the findings. Further site visits were made by Tim Cornish and Brian Herbert to try and establish the site of the forge. A final site visit was held in May by all parties (except NE) to finalise the site of the forge identified by Brian Herbert.

Nicola collated the information and drafted this report with additional contributions by Tim Cornish and Brian Herbert [WIRG]. The results of the Level 3 survey were prepared by Crispin Jarman and comprise the map at the end of this report together with a digital .pdf version [on the disc at the end of the report].

The Level 1 survey was undertaken on 17th and 19th March 2014. The weather was dry and overcast but clear. The site conditions were good, with a significant amount of coppice work already completed. The ground flora comprised bluebells starting to come through and the canopy was open. Points were identified using a Garmin GPS MAP 60CSX Atlantic with a level of accuracy +/- 3.0m – 4.0m.

Five fixed points were placed outside of the SAM area (orange painted posts with numbers in black). These points were used to sketch plot in the features as viewed from them. Unfortunately between the completion of the Level 1 and the start of the Level 3 on 1st April, all but one post had been pulled out and thrown in the stream.

The Level 3 topographic survey was undertaken using a combination of differential GPS and EDM Total Station as appropriate. The survey was tied to Ordnance Survey National Grid and Datum using differential GPS (Leica Viva GS08) connected to Ordnance Survey correctional data in real time via live internet feed from Leica SmartNet. A positional accuracy of within 50mm (3D) was obtained using the ETRS89 to OSGB conversion via the OSTN02 projection.

A network of fixed control points were established by differential GPS in order to tie EDM Total Station surveying to the National Grid. See Level 3 Survey Map 3 in the folder at the end of this report.

A full topographic survey of existing landscape and historic features identified from the Level 1 Walkover within the survey area was undertaken, along with a detailed contour survey at an appropriate contour interval. See Map 3 in folder at end of the report. The contour interval was established during analysis of the data and set at 0.5m.

Where access was limited by undergrowth, or other factors, reasonable effort was made to capture data, but there are areas on the plan which have been left blank (as indicated). The field work was undertaken at the beginning of April 2014. Areas not covered by the survey due to difficulties in the ground cover are marked on the Level 3 map.

Plans were produced using AutoCAD Map 2013 and digital and printed copies have been supplied at appropriate scales (1:1,000 or larger as specified in English Heritage 2007).

2. Summary History

The following table summarises the history of the Mayfield Ironworks site and draws on the findings set out in Cleere and Crossley (1995).

Table 1. Summary History of the Mayfield Ironworks site

DATE	DESCRIPTION	SOURCE
	Manor of Mayfield – See of Canterbury	
1545	Archbishop of Canterbury – Iron works on his lands.	Schubert 1957:381
1570	Thomas Gresham acquired furnace	
1573	Gresham described in Hogge's petition as casting guns	PRO SP 12/95/62
1574	Gresham described in Hogge's petition licensed to export cannon	PRO SP 12/95/62
1574	Gresham listed as the owner of Mayfield Furnace	PRO SP 12/95/62
1578	Gresham casting guns and exporting cannon	HMC Hatfield, V. Pt2:216 Bell-Irving 1903:59, 175-6
1579	Will of Thomas Gresham Manor and Estate of Mayfield and Wadhurst passed to Sir Henry Nevill	Horsfield Vol 1 1835 p417
1598	Thomas May bought furnace, (and also the manor of Mayfield)	PRO E178/4143; SxRS Vol XX. Sussex Manors Fines vol 2 p295
1617-18	John Baker purchases the Manor and Iron works	SxRS Vol XX. Sussex Manors Fines vol 2 p295
1653	Furnace listed as working	
1664	Furnace listed as repaired and "stocked upon account of the warre"	
1712	Described as Mr Baker's 'Old Furnace' where veins were bought from nearby.	Pelham Accts for Waldron Furnace (Straker 1931)
1724	Henry Pelham purchases the manor and tenements	
1738	Nicholas Fowle gentleman purchases manor and tenements	SxRS Vol XX. Sussex Manors Fines vol 2 p295

2.1. Brief History of Mayfield Park¹²

In the medieval period, the manor of Mayfield and its demesnes lands belonged to the Archbishops of Canterbury. It is described as the northern beadlewick of the Archbishop of Canterbury's Manor of South Malling.¹³ They had residences across Kent and East Sussex as places to stay during their travels across the diocese and also places for entertainment. The palace at Mayfield overlooked a large deer park and the demesnes lands extended into Wadhurst.¹⁴ The location of the palace on the top of the hill with its extensive views to the north across the park is no accident and the choice of this location probably deliberate. The park was enclosed by Archbishop Boniface's men employed to dig the bank and ditch, and to erect the pale creating a park of over 400 acres.¹⁵ Reference to the repair of the pale is

¹² The author is indebted to Tim Cornish for providing notes on the park, which will be published in a history of Mayfield (forthcoming)

¹³ Brandon, P. The Kent and Sussex Weald. p125

¹⁴ Horsfield, T.W. 1835 History of Sussex. Vol. 1 p 417.

¹⁵ Tim Cornish pers.comm; ESRO AMS 5831-3 [n.d. c.1663] Map of lands of John Baker

recorded in Rolls at Lambeth Palace. The archbishop also had an iron works. This would have been a bloomery site and not reliant on water-power thus it is unlikely to have lain within the valley or necessarily the park. Tim Cornish has researched and found that clay tile production was undertaken within the park, as was stone quarrying, underwood cutting, as well as the keeping of deer and grazing of stock termed 'agistment'.

Archbishop Islip is recorded as having nine acres of fishponds in his park of Mayfield.¹⁶ Fresh fish were an important necessity in the medieval period eaten during Lent and on Wednesdays, Fridays and Saturdays. So a good supply of a range of fish was bred and farmed within the park. It is surmised that the present furnace site lies within this area which did lie within the park.¹⁷ The ponds probably lay upstream of Coggins Mill which was located on the edge of the park. Sir Thomas Gresham did give fish from the ponds to Lord Burleigh. It is not unknown for fish to also be 'farmed' in hammer ponds as for example at the nearby Hawksden Forge.¹⁸

The C17 map which shows the iron works is also a map of the deer park and shows its boundaries (Figure 3 page 15).¹⁹ The cartouche on the map records the crests of the Farnden family and the Baker family. The map shows the lands which formed part of the settlement on the marriage of Ruth Farnden to John Baker in 1663 and thus dates the map,²⁰ By this time the park had been dis-parked and enclosed to fields and woodlands.

¹⁶ Cooper, W.D. Sx. Arch. Collections 1869 viol 21 p6

¹⁷ Tim Cornish pers.comm.

¹⁸ ESRO GLY 1227

¹⁹ ESRO AMS 5831-3

²⁰ Tim Cornish pers.comm..

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LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD



Figure 3. Map of the Lands of John Baker in Mayfield n.d. c. 1663 [ESRO AMS 5831 – 3.
[Reproduced with the permission of the Archivist of the East Sussex Record Office]

2.2. The Ironworks

As already stated above it is unlikely that the present ironworks site was also the site of the medieval iron works. An iron bloomery would not have been compatible with a landscape for recreation and for producing fish. The attraction for the C16 iron masters, was probably the remains of the medieval fish ponds which could readily be adapted for use as hammer ponds.

Sir Thomas Gresham was the principal owner and he acquired the furnace and forge in 1570, together with much of the former Archbishop's lands, including the Old Palace and the deer park. Sir Thomas was a financier and agent of Queen Elizabeth in the Low Countries, where he probably sold ordnance legally as well as on the black-market.

The iron works on this site are first recorded in 1572 in a letter which refers to Mr Danyell, Thomas Gresham's founder who was leaving his employ.²¹ It is referred to in 1573 in Ralphe Hogge's petition to the Crown and in 1574²² it was described as being employed to "no other use but to the makeinge of Ordnance and Shott".²³

Table 2 (on page 17) records the subsequent owners of Mayfield Furnace. The Estate map produced in the early part of C17 shows the lands of John Baker, See Figure 3 (page 15). The map gives a detailed picture of the furnace and its various ponds and pens.²⁴ (See Figures 4a and 4b on pages 22 and 23). A particular of the Manor of Mayfield records the Iron Furnace and mine all within the park of Mayfield belonging to Sir Thomas May.²⁵

Straker 1931 records a fire back made at Mayfield Furnace which appears to display the Fowle rebus.²⁶ In 1738 Nicholas Fowle purchased the manor and tenements.²⁷

2.3. Post-Ironworks

Mayfield ironworks passed with the Manor of Mayfield and its lands from Sir Thomas Gresham to Sir Henry Neville in 1579, (Neville's mother was cousin to Thomas Gresham). There is correspondence by Henry Neville about the ironworks while he was working with Robert Sackville.²⁸ The property was then sold to Thomas May in 1598. In 1617 John Baker of Bungehurst purchased the manor with the iron works. The Bakers were already operating ironworks else and the Mayfield works were probably well placed for them to further the operations. The Kirby family through marriage into the Baker family then acquired the Manor of Mayfield, Old Mayfield Place together with the dis-parked deer park.

²¹ Entry on WIRG database www.wirgdata.org

²² TNA SP 12/95/62

²³ Straker, E. 1931. Wealden Iron p292

²⁴ ESRO AMS 5831-3

²⁵ ESRO KIR/3/2 nd c1617. Detailed particular of the manor of Mayfield, endorsed 'Sir Thomas May's particular

²⁶ Ibid p169. It is recorded as being in the South Kensington Museum (S.A.C XLVI).

²⁷ SxRS Vol XX. Sussex Manors Fines Vol 2 p295

²⁸ James, B. & Rubinstein, W.D. 2005. *The Truth will Out*. Pearson/Longman [Biography of Henry Neville]

[For details on the Kirby family see the relevant East Sussex Record office catalogue - ESRO KIR].

3. Mayfield Ironworks in the wider context of the Wealden Iron industry

Mayfield was located in the heart of the iron producing country in East Sussex. This furnace was one of three furnaces in the parish of Mayfield. There were also four forges, not including a possible forge at Mayfield Ironworks [See 3.4.3. ii below]. These are discussed by Cattell (1979).²⁹

Table 2 Other ironworks in Mayfield [Source Cleere and Crossley 1995; Cattell 1979]

Place/name	C16-C17Owner	Location	Dates in operation
Mayfield Forge	Sir Thomas Gresham	TQ592814	1570-1664
Mayfield Furnace	Sir Thomas Gresham	TQ593284	1570-1664
Coushopley? Furnace	John Baker	TQ604302	1547-1717
Bibleham Forge	Sir John Pelham	TQ641266	1550-1787
Isted's Forge possibly Hawksden	Richard Isted	TQ623266	1559-1787
? Forge	Richard Crowe [Cattell ?]		
? Forge possible Hawksden	Richard Greene [Cattell ?]	TQ623266	1559-1787
Moat Mill Forge		TQ592251	1574
Woolbridge Forge		TQ571265	1574
Old Mill Furnace	C16 John Baker	TQ588245	1543-EC16

3.1 Mayfield Ironworks in its landscape context

The ironworks occupy the upper reaches of a tributary of the River Rother. Hawksden and Bibleham Forges lie about a mile downstream. Water to power the hammers, bellows and other machinery was a limiting factor in Wealden iron production, so the construction of pen ponds as reservoirs for the main hammer pond was essential. The location of Mayfield Furnace meant that pen ponds could be constructed on the main stream but also on several tributaries upstream of the main hammer pond. Iron stone was mined in the upper slopes of the valleys and brought to the furnace. Large mine pits are located in Heronry Wood to the north of the site. The fact that the old road from Trodgers to Mayfield crossed the pond bay facilitated good access for both the transport of the raw materials to the site and also the finished guns etc. to London possibly via Tonbridge and also for those which were exported via Sussex coastal ports.

3.2. Potential for further survey –research

* A systematic search of the archives is needed to pull all the loose ends of the history of the site together. This work should reveal detailed information on the ownership of the site and a wider search of the archives relating to Mayfield may reveal some information on those who worked at the site.

²⁹ Cattell, C.S. 1979. The 1574 lists of Wealden Ironworks. Sx A C 117 p161-171.

* A systematic search of all the adjacent gill woods lying on the tributaries upstream of the ironworks site is likely to reveal further smaller pens. A full record of the water system will complete the extent of the ironworks.

* The pond sites would be suitable for coring to establish silt depth, content and possible age.

3.3. Archaeological Significance of the Heritage Features

Mayfield Furnace is of national significance due a number of key attributes:-

- i. The owner – Sir Thomas Gresham, financier and agent of the crown in the Low Countries, and major exporter of ordnance under licence (arms dealer).
- ii. Furnace output – cannon for use at home and for export.
- iii. Site layout - This is the only furnace in East Sussex producing cannon which had a boring mill adjacent to the furnace and powered by a separate water source.³⁰
- iv. The physical completeness of the whole site - as a place of iron production and cannon manufacture it is almost complete within its historic landscape of the High Weald. All the hammer ponds and pen ponds with their respective bays are still present although breached and drained. The sites of the furnace/s, forge/s and the boring mill can still be identified and probably retain below ground structures. The surrounding woodlands provided the fuel and also the source of iron stone – as the numerous iron pits testify. There are also areas of possible slag heaps on the slopes above the furnace site which have been used in the later times as metalling for roads and possibly for the re-alignment of the lane from Trodgers to Mayfield in circa 1831. Some small heaps also do still survive downstream, for example along the edge of the ‘Furnace Stream’. Also now removed is the old over-seers cottage which survived into the early part of the twentieth century.
- v. The medieval context of the site – the potential for below ground structures relating to the construction of the medieval fish ponds lying within a medieval deer park, together with the remains of the park pale boundary at the eastern end of the site.
- vi. Access for the public – The site is easily accessible via public rights of way and is well-used by local walkers. The estate has erected an informative display board on the edge of the foot path by the pond bay.

³⁰ Brian Herbert WIRG (pers.comm)

3.4. Types of Archaeological Features

The following section looks at each main group of features in turn. It describes their physical attributes, gives an assessment of their significance to the site and the wider landscape together setting out recommended management guidelines. See Maps 1a and 1b (pages 24 & 25) for location of sites as plotted on GIS. These maps also show where some of the features from the C17 map are located. Map 2 (on page 26) is a Level 1 sketch plot of the same features. Map 3 is the Level 3 measured survey of the core area of the site. This is in the folder at the rear of the report.

May field Ironworks is a complex site and land use management of the paths and woodland in the following centuries have damaged many features, although it is likely that a considerable amount of below ground archaeology lies undisturbed both within the present scheduled area and well beyond it.

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LEVEL 1 & LEVEL 3 SURVEY
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Table 3. Summary Table of Heritage Features for Mayfield Iron Furnace [See Maps 1a & 1b p24 & p25 for location of features]

Number	GIS Grid Reference centred	Scheduled	Description	GPS Grid Reference	Description of Position
01	TQ 5924928150	Yes	Pond Bay to (Lower) Hammer Pond for furnace		
02	TQ 5927828089	Yes	Pond Bay to Boring Mill Pond	TQ 559275128117 +/- 3m TQ 559309128089 +/- 3m TQ 559300128104 +/- 3m	W end E end At breach in bay
03	TQ 5899928149	Yes	Pond Bay to pen pond by road		
04	TQ 5883028401	Yes	Pond Bay to Upper pen pond to furnace		
05	TQ 5902328257	No	Pond Bay to middle pen pond to furnace		
06	TQ 5915828008	No	Pond bay to pen pond for Boring Mill pond	TQ 559224128078 +/- 3m	On top of bay by breach
07	TQ 5880428415	No	Pen pond (Upper) to furnace		
08	TQ 5893328306	No	Pen pond (middle) to furnace		
09	TQ 5914728164	No	Hammer Pond for Furnace		
10	TQ 5926128079	Yes	Hammer Pond for Boring Mill		
11	TQ 5914927993	Yes	Pen pond for Boring Mill		
12	TQ 5895828134	No	Pen pond for middle pond		
13	TQ 5920828262	No	Wood bank to Banky Wood	TQ 559208128262 +/- 3m	By junction with PRoW
14	TQ 5927228220	No	Quarry in west end of Banky Wood	TQ 559263128212 +/- 3m	
15	TQ 5939528022	No	Park pale to the medieval deer park of Mayfield	TQ 559408128042 +/- 3m TQ 559367128027 +/- 3m	At junction with Furnace Stream At S end
16	TQ 5931328031	No	Bank and ditch with dog-leg corner	TQ 559377128047 +/- 3m	At dog-leg corner
17	TQ 5935028031	No	Bank and ditch	TQ 559340128061 +/- 3m TQ 559367128027 +/- 3m	W end E end
18	TQ 5932428045	No	Network of 4 ditches meeting by path	TQ 559327128060 +/- 3m	Where ditches cross track
19	TQ 5937428062	No	Quarry or levelled area on side of gill	TQ 559360128081 +/- 3m	On feature
20	TQ 5934828071	No	Ditch from (18) into (19)	TQ 559337128067 +/- 3m	On S end of feature
21	TQ 5933128071	No	Ditch from (18) into Furnace Stream		
22	TQ 5933128083	Yes	Overflow channel from Boring Mill Pond	TQ 5459322128113 +/- 3m	Where this joins main Boring mill stream
23	TQ 5930527987	No	Slight ditch from edge of Vicarage Wood N to (18)	TQ 559323128035 +/- 3m	At S end by edge of feature

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Table 3 continued

Number	GIS Grid Reference centred	Scheduled	Description	GPS Grid Reference	Description of Position
24	TQ 5929928005	No	Slight ditch joins (23) from west		
25	TQ 5928128048	No	Slight bank & ditch with right angle bend from (18) into Boring Mill	TQ 559291128053 +/- 3m TQ 559285128068 +/- 3m	By path By edge of Boring Mill pond
26	TQ 5920128079	No	Site of Overseers House	TQ 559209128114 +/- 3m	
27	TQ 5930928175	Yes	Bank to main leat from Hammer pond		
28	TQ 5937028141	Yes	Leat or overflow from main hammer pond	TQ 559439128040 +/- 4m	At SE end
29	TQ 5939028083	No	Small ditch from leat to forge ?		
30	TQ 5941928083	No	Possible site of the forge	TQ 559390128094 +/- 4m	
31	TQ 5944328026	No	Culvert or bridge at end of (28)	TQ 559361128048 +/- 3m	
32	TQ 5951728048	No	Charcoal Hearth at SE end of Banky Wood	TQ 559519128052 +/- 3m	On feature
33	TQ 5949728009	No	Wood bank to SE end of Banky Wood	TQ 559527128036 +/- 3m	Where this and 34 join
34	TQ 5952528006	No	Field Bank to Little Forge Field	TQ 559527128036 +/- 3m	Where this and 33 join
35	TQ 5943628141	No	Lynchet along NE side of Banky Wood		
36	TQ 5933528186	Yes	Charcoal Hearth at W end of Banky Wood	TQ 559353128205 +/- 3m	On feature
37	TQ 5931028187	Yes	Quarry at W end of Banky Wood		
38	TQ 5926528115	No	Ditch from Boring Mill to Furnace Stream		
39	TQ 5923228093	Yes	Depression by site of House	TQ 559257128092 +/- 3m	On feature
40	TQ 5928728054	Yes	Rectangular levelled area S of Boring Mill Bay	TQ 559311128068 +/- 3m	On feature
41	TQ 5909228310	No	Site of slag heaps from Furnace		
42	TQ 5927828181	Yes	Possible site of furnace		
43	TQ 5926028137	Yes	Site of furnace damaged by bridge		
44	TQ 5930328099	Yes	Site of boring mill		
45	TQ 5924828093	Yes	Mound of charcoal and slag		
46	TQ 5925628053	No	Slight bank and ditch		
47	TQ 5954328066	No	Bank and ditch – Park pale		
48	TQ 5943328016	No	Site of forge as identified during this survey	TQ 559466128032 +/- 3m	On feature (canopy overgrown)
49	TQ 5921028050	No	Site of a ‘pig’ in boring mill stream – left there	TQ 559221128078 +/- 3m	On feature (canopy overgrown)
50	TQ 5930428171	Yes	Possible spillway to a second furnace site		On feature

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Figure 4a .Extract from the Lands of John Baker n.d. c. 1663 [ESRO AMS 5831-3] showing all the main ponds
(Reproduced with the permission of the Archivist of the East Sussex Record Office).

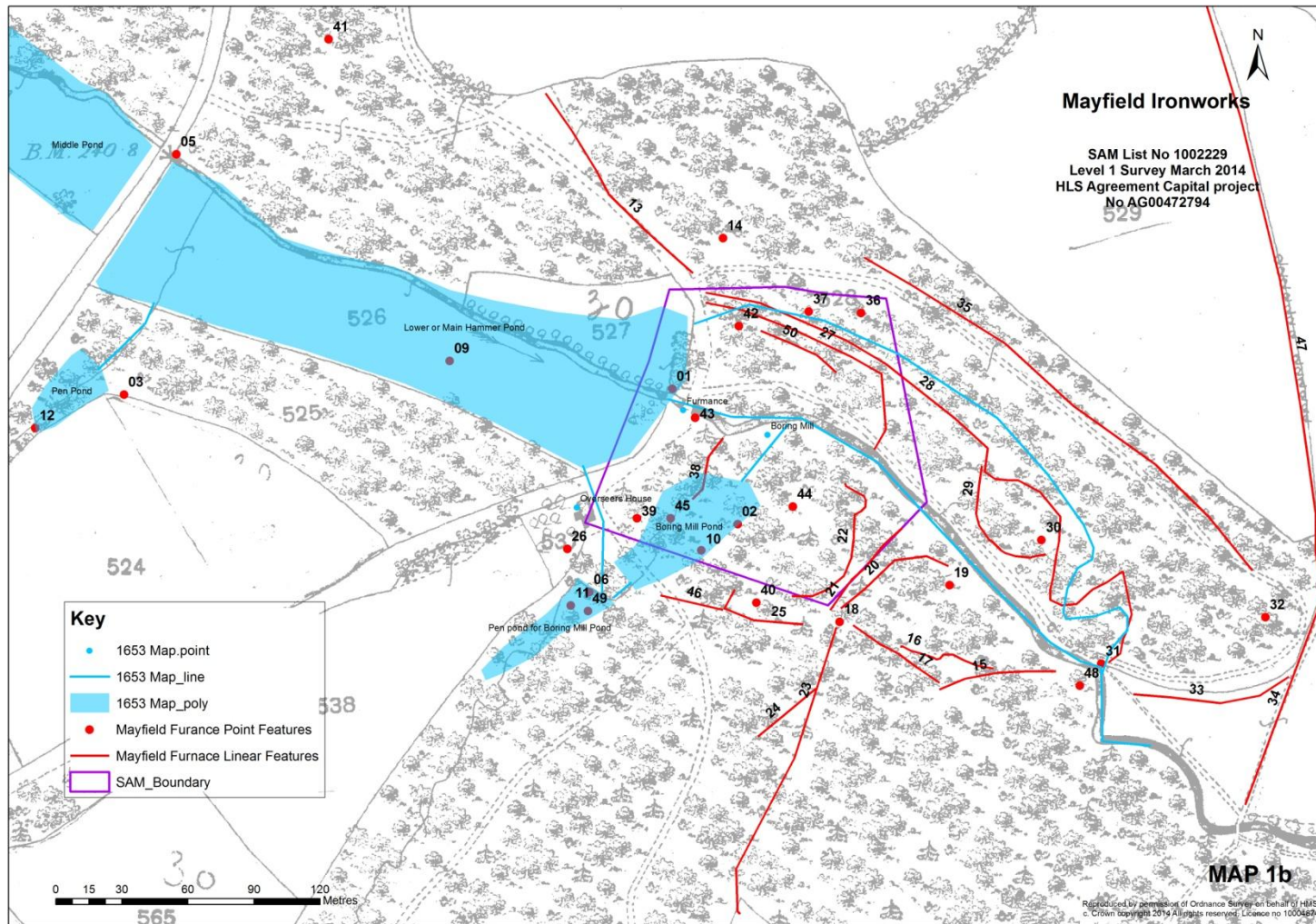
MAYFIELD IRONWORKS
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Figure 4b. Extract from the *Lands of John Baker* n.d. c. 1663 [ESRO AMS 5831-3] showing the main ironworks site (Reproduced with the permission of the Archivist of the East Sussex Record Office).

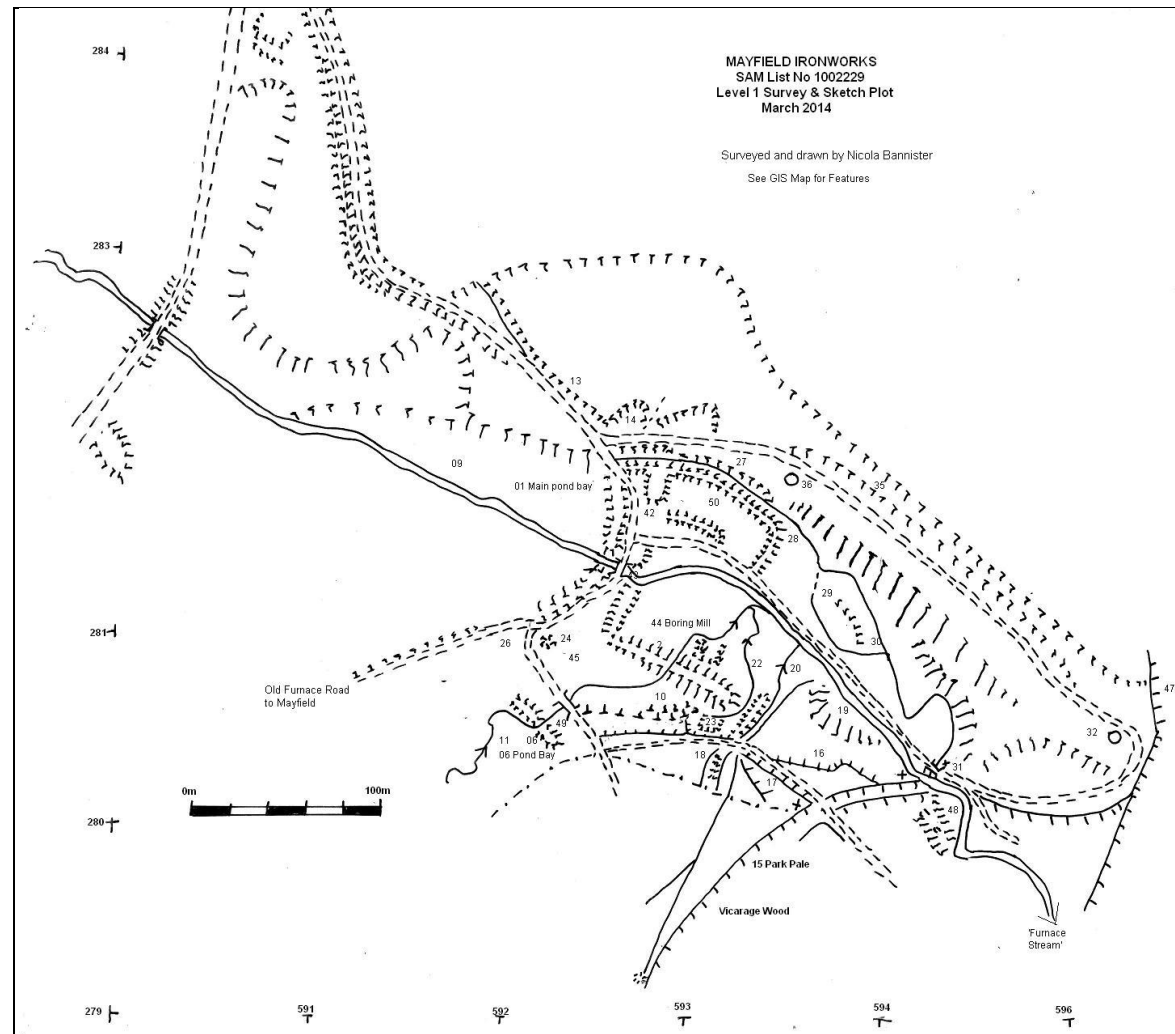
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Map 1b. The survey area of the Mayfield Ironworks site showing heritage features recorded during the Level 1 Assessment

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Map 2. Level 1. Sketch Plot of features [Compare with map in Appendix III]

3.4.1. Boundary Earthworks

A number of boundary earthworks were recorded across the site – some were substantial and easy to identify. Others were more ephemeral but still obvious man-made features.

i. Park pale and Wood banks

Assessment

Two main wood banks were identified and recorded during the Level 1 survey; - the wood bank dividing Vicarage Wood from the former Brickhurst Wood [15] and a smaller wood bank dividing the main part of Brickhurst Wood from the woodland along the gill of the main stream [17].

The wood bank to Vicarage Wood [15] comprises a silted ditch (2.0m by <0.20m) on the north side with an asymmetrical bank (2.5m by 0.4m) on the south side. It terminates at the east end on the edge of the gill above the stream. The west end continues as the boundary to Vicarage Wood. The ditch being on the north and west side indicates that this bank was dug to enclose Mayfield deer park as shown on the c. 1663 map of Old Place Farm Mayfield.³¹ To the south about 10m away and running parallel is another bank and ditch. It appears that the ground between was a ‘trench’ or access route through the woods.

Running northwest from wood bank [15] is the remains of another wood bank [17]. The silted ditch (2.0m by <0.20m) lies on the southwest side, with an asymmetrical bank (3.0m by 0.3m) on the northeast side. This feature is truncated on the southeast end by the ditch of the previously described wood bank [15]. At the northwest end the feature is joined by a ditch [18] and terminates or is cut by the sequence of ditches that meet at this point [18]. A continuation of this bank and ditch at the northwest end was not observed during this assessment. It is probably that this was a wood bank enclosing the woodland along the edge of the gill and stream and that its northern end was destroyed by the construction of the boring mill.

Banky Wood on the north side of the gill valley is also bounded by wood banks or boundary earthworks. At its northern end is a wood bank [13] which comprises a retaining bank with silted ditch on the side by the old road which leads up from the site of the forge [48]. The boundary takes this form due to the sloping nature of the ground surface and the fact that the track here has been hollowed and levelled. At the northern end a short length also forms part of the medieval park pale to Mayfield deer park.³² At the south end of Banky Wood is a curving wood bank [33], which is followed by a track from the gill up to the top of the wood, where it joins another bank orientate NNE-SSW. This bank (2.0m by <0.2m) is more rounded than asymmetrical and appears to have a ditch on both sides. The ditch on the north side is 1.5m by <0.25m whilst that on the downslope south side is almost completely silted.

³¹ ESRO AMS 5831-3

³² Ibid

Wood banks, including their associated ditches are a feature of ancient woodland and generally date from the medieval period. They were dug in order to mark ownership boundaries but also to provide a suitable earthwork on which to plant and maintain a stock-proof hedge when the coppice had been cut. The enclosing of woodland probably began when trees were being managed in a regular cycle for underwood. This process of enclosure reached its height in the early medieval period, when woods were either used primarily for grazing or for timber and underwood production. Stock control became important. Wood banks tend to have an asymmetrical profile with the ditch on the non-woodland side. Spoil dug from the ditch was heaped on the side of the woodland and then trees and shrubs encouraged to grow along the top. After coppicing these trees were probably then laid to form a stock-proof hedge, which would grow well as the coppiced wood was not then high enough to shade the hedge. With the cessation in coppice management in the early part of the 20th century and the development of over-stood coppice these woodland hedges became shaded out, leaving only the stubs and marker trees.

After about 7 years growth, sometimes stock was allowed back in to graze through the woodland ground flora. The ditches original linked in with the wider water management of the fields; drains within the wood were also directed into these ditches and then into the natural water courses. Wood banks are therefore of considerable antiquity, dating from when the woodland was enclosed from the open wood pasture commons. In some cases they can pre-date the medieval parish church. Depending on the soil types and geology, the old ground surface of the wood may survive as a layer in the soil beneath the bank.

The park pale was probably dug by men working for Archbishop Boniface before 1354, when the park was described as being ancient.³³ Remains of the pale can be traced as intermittent stretches of substantial earthworks, re-worked into field, wood and roadside boundaries along its course around the northern part of Mayfield.

Significance

These wood banks are of high local significance. They are probably the oldest features on the site dating from the medieval period, when the woodland was being enclosed and subdivided for management. Their condition suggests that they have not been managed for a long time. The remains of the park boundary earthwork [15] probably preserves below ground evidence of the wooden pale in the form of post holes.

Management

The wood banks are in good condition and lie well-preserved within the woodland. Wood bank 17 shows evidence of vehicles having been driven over it in the past, possibly when Brickhurst Wood was clear-felled. The management guidance for these sites are:-

- a. Minimise disturbance to any known or potential archaeological feature or site [Darvill 1987; Forestry Authority 1995).

³³ Tim Cornish pers.comm. from his researches for his forthcoming book on Mayfield

- b. Avoid taking any wheeled or tracked vehicles over the earthworks.
- c. If it is unavoidable, select one area, cover with plenty of brash and confine access to this one point. Afterwards carefully remove the brash. Consider any necessary work to be done in the summer when the ground conditions are dry but avoid the bird-nesting season.
- d. If extraction of timber is considered using a horse/s and sledge/and or skid etc. undertake extraction works during conditions when the ground is dry, as hooves can easily poach the soft clayey soils.
- e. Avoid erecting any new fencing on the earthwork, to avoid damaging any below ground old ground surfaces and also avoid any new tree planting on the earthwork.
- f. Manage burrowing animals using humane methods but which avoids digging into the earthwork.



Figure 5. Boundary earthworks

ii. Other Boundary Earthworks

Assessment

Wood banks were not the only boundary earthworks identified during this topographical survey. A small dog-legged bank (1.0m by <0.3m) and ditch (1.0m by <0.25m) [16] runs from the wood bank [15] northwest to be cut by the foot path from the boring mill. It may have joined with the wood bank [17] to form a small enclosure.

A further similar bank and ditch can be found on the south side of the site of the pond for the boring mill. Here two boundaries survive. One is 'L' shaped [25] which runs from the rectangular feature [18] due west before turning north to end at the edge of the pond. At the corner a branch runs due west towards the footpath [46]. The banks are about 1.0m wide by <0.3m high and with silted ditch of about 1.25m wide and <0.2m deep.

Significance

Given the proximity of these boundaries with the site of the boring mill and its features, it is tempting to postulate that these formed enclosures associated with the activities on the site at this time. Given that such industrial output would have needed a considerable work force, requiring maintenance such as food, shelter etc. and also that other trades were needed such as carters, wheel wrights, black smiths and farriers. They would have needed to be accommodated near to the furnace, with possibly their areas of work demarcated with small boundaries and fences. Haulage animals (horses and oxen) would have required enclosures while resting etc. These banks then become of high significance as they potentially form part of the ancillary support infrastructure to the iron working site – features which have been poorly recorded in the past as part of the industrial process.



Figure 6. Bank & Ditches

Management

These banks are in good condition and lie well-preserved within the woodland. However their dimensions are very slight and would be easily overlooked during active woodland management. Further such features may have been sited in former Brickhurst Wood to the south but any such slight features appear to have been destroyed when the wood was clear-

felled and laid down to pasture. This is not to say that there may survive below ground stratified deposits, left from these activities such as finings from black-smiths and farriers, or post-holes from temporary fencing. For the existing features the following should be observed.

- a. Minimise disturbance to any known or potential archaeological feature or site [Darvill 1987; Forestry Authority 1995).
- b. Highlight the feature in the wood during periods of active management using coloured tape.
- c. Avoid taking any wheeled or tracked vehicles over the earthworks.
- d. If it is unavoidable, select one area, cover with plenty of brash and confine access to this one point. Afterwards carefully remove the brash. Consider any necessary work to be done in the summer when the ground conditions are dry but avoid the bird-nesting season.
- e. If extraction of timber is considered using a horse/s and sledge/and or skid etc. undertake extraction works during conditions when the ground is dry, as hooves can easily poach the soft clayey soils.
- f. Avoid erecting any new fencing on the earthwork, to avoid damaging any below ground old ground surfaces and also avoid any new tree planting on the earthwork.
- g. Manage burrowing animals using humane methods but which avoids digging into the earthwork.

3.4.2. Water Management

The most important element in a working forge and or furnace was the need for power – in the case of the Wealden iron industry water power was one of the major limiting factors to its growth. It was important to capture as much head water as possible and control the flow. This fact was observed by Anne Dalton in her study of the C16 map of Mayfield Place Farm.³⁴ This map is extremely useful as it shows in considerable detail the various elements of the Furnace site, including the water system. [See Figure 4a p22 & 4b p23]. It is unlikely that this map records all the pen ponds, which may lie in the upper reaches of the tributary streams.

i. Pond Bays

Assessment

There are three pond bays on the main gill stream which embanked three ponds a Lower [01], Middle [05] and Upper [04] with one pond bay [03] on a tributary to this stream by the ‘new’ road. This tributary stream also had a pond bay and pond in Lodge Wood in the C17.³⁵ [The site was not examined during this survey]. It is also thought likely that additional pen ponds lie further upstream beyond the Upper pond. On the Boring mill stream are two pond bays [02, 06], with potentially further ones upstream in the gill. Thus at least two main ponds and five pen ponds were needed to power the furnace, boring mill and the forge. The water

³⁴ ESRO AMS 5831 -3

³⁵ ESRO AMS 5831 -3

management amounted to probably at least five over-shot wheels, one on each of the furnace and boring mill with possibly three at the forge site. Water was probably brought to each wheel using over-head or raised wooden launders and flumes, the remains of one launder lies in the bottom of the stream by the bridge [See 3.4.3.i below].

The main route to Mayfield formerly went along the bay [01] to the main (hammer) pond [09]. The over-spill may have been at the northern end into a large leat [28] which flowed parallel with the gill stream before discharging into the original stream course. [See 3.4.2. iv below] It may be that this bay was built up using slag from the furnace (and on the site of a medieval dam to a fishpond) and may have been undertaken in order to increase the water storage capacity or to mitigate silting.³⁶ The bay [05] between this pond [09] and the middle pond [08] has now been converted to a causeway bridge for the ‘new’ road from Trodgers to Mayfield. This took place in c. 1831.³⁷ It is not clear where the over flow was located for this as the bay has been so altered to form a bridge. The pond bay [04] between the middle [08] and upper pond [07] lies in over-stood coppice at the SW corner of what remains of Furnace Wood. There the breach is at the south side and possibly where the overspill was also located. The rest of the bay is intact.

The two bays to the boring mill ponds lie in coppice and secondary woodland. The lower bay [02] by the boring mill [44] has an overspill channel [22] on the southeast end which flowed round the working site before discharging into the boring mill stream. The upper bay [06] is breached at the east end probably where the over spill point was located. However the map of Old Palace Farm c.1663³⁸ shows a ditch or spillway running from the northern end of the pond bay northwards past the site of the house and into the corner of the main ‘hammer’ pond to the furnace. This must have been a deep channel to go ‘uphill’. No evidence was found for this channel on the ground at its southern end, and the north end lies outside of Wadhurst Park Estate property.

Table 4. Summary of the Pond bays

Survey Number	Description	Height (m approx)	Length (m approx)	Scheduled
01	Main pond bay which took the road to Mayfield and lay just above the furnace site	3.0	75.0	yes
02	Main bay for the Boring Mill on a tributary stream	3.0	65.0	yes
03	Small pond bay – remains of – on tributary stream	?	?	no
04	Pond bay between Upper and middle ponds on main stream	2.5	70.0	yes
05	Pond bay between Lower and middle ponds now takes present road	3.0	60.0	no
06	Small bay on boring mill stream	1.5	20.0	no
?	Bay in Lodge Wood ?	?	?	?

³⁶ Cleere and Crossley 1995 p227

³⁷ ESRO CK 64/260

³⁸ ESRO AMS 5831-3

Significance

All these bays with their ponds are clearly shown on the C17 estate map of Old Mayfield Place Farm (Figure 3 p15).³⁹ They form an integral part of the whole Mayfield Ironworks site, and although breached (and some have been modified) they are a highly significant element of the site and its wider landscape context. Although only three are scheduled, all are of national significance as part of the water management system needed to run the ironworks site.

In addition it is thought that the three main ponds may have originated as medieval fishponds – part of the deer park of Mayfield⁴⁰ and thus the main pond bays may have medieval structures incorporated within them.

In addition some of the linking ditches and water courses, may still survive buried beneath the ground surface.

Management

Three of the six sites lie well preserved in coppice woodland. They have been breached to allow the pond to drain and the streams to flow. Where the water flows through the bays the earthworks of the bays are gradually being eroded by the streams, exposing roots and the earth/clay core of the dams. The over-stood coppice on the boring mill pond bay [02] has been cut back in the winter (2013-2014) revealing the earthwork and reducing the threat of wind throw. However the coppice on the other two [06, 04] remains and the threat to wind-throw is high. It is recommended that the over-stood coppice on the bay [06] for the boring mill pen pond is reduced in height. The bay between the upper and middle ponds is not within the ownership of Wadhurst Park Estate.

The other three bays lie in open ground - these have been modified by subsequent land use. They also do not form part of the Wadhurst Park Estate.

³⁹ ESRO AMS 5831-3

⁴⁰ Tim Cornish pers.comm

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Pond bay to main pond looking N [01]



Pond bay to main pond looking S [01]



Boring mill pond bay [02]



Boring Mill pen pond bay[06]



Pond bay to Upper pond in Furnace Wood [04]



Pond bay on tributary stream [03]

Figure 7. The Pond Bays [01, 02, 03, 04, 05, 06]

ii. Hammer Pond and its main ‘reservoirs’ [07, 08, 09]

The name ‘hammer ponds’ is a generic one given to the main pond or embanked water-body which powered either a furnace or a forge. The water for a furnace as in the case of Mayfield was used to power bellows for the blast furnace. The water was ‘re-captured’ using tail races, ditches and launders, and directed to a forge further downstream where it would have powered one or several hammers.

Assessment

As discussed above the C16 map shows all the main ponds (Figure 3 p15). The upper [07], middle [08] and lower [09] ponds occupy a significant part of the main valley and it is possible to trace their outlines in the valley topography (Map 1a p24). The middle and upper ponds form the main reservoirs for the lower pond. By erecting bays it enabled the flow of water to be controlled through the iron working area. The ponds had been drained by the late C18 as none are shown on the Ordnance Surveyors Draft Drawings for the 1” 1st edition (Figure 16 p 56) [OSDs]. The middle pond shows evidence of slumping of the sides of the valley which probably occurred when the pond was drained. The exposed bed rock was subsequently quarried out.

Silting of the ponds was an issue during the active period of iron working by reducing the area for water storage. Large ponds were drained and the silt dug out. There is no recorded evidence for this at Mayfield but the hammer pond at Hawksden forge (further downstream) is recorded as having been drained, de-silted and then re-stocked with fish.⁴¹ The middle pond in Furnace Wood now acts as a silt trap for surface water run-off from the fields around Trodgers Farm, as graphically seen this winter during the long periods of heavy rain.

It is thought that these three ponds may have originated as medieval fishponds – part of the deer park of Mayfield. The park is recorded as having nine acres of fish ponds.⁴²

Significance

The sites of these ponds are of high national significance for several reasons:-

- a. the relationship with the iron working site and forming part of the water management system for the iron works.
- b. the silts preserve stratified deposits within them, especially close to the pond bays where material would be washed down.
- c. the possibility that the ponds originated as medieval fishponds and thus preserve not only C16 deposits but silts from the 11th and 12th centuries.

None of the ponds are scheduled.

⁴¹ESRO GLY 1227, 1234

⁴² Lambeth Palace Rolls from Tim Cornish’s (pers.comm) researches on Mayfield

Management

None of the areas of the ponds lie within the ownership of the Wadhurst Park Estate. However in the area of the main ‘hammer’ pond [09], two new ponds have been dug for wildlife, fed by water from the tributary stream.

These were undertaken as part of a stewardship scheme and whilst of wildlife value they will have disturbed stratified deposits. It is not known how deep the ponds were dug nor how deep the silts are, not where the spoil was placed.

iii. The Boring Mill Pond and the Pen Ponds [10, 11, 12]

Assessment

Working in operation with the furnace was a boring mill which cut out the centre of the cannon in order for it to shoot the ball in a straight trajectory. The boring machine was powered by water. What makes Mayfield unique is that the mill had a separate water supply enabling it to operate independently from the furnace and forge. It had a main pond [10] and smaller pen pond [11] just upstream. These two ponds are shown on the C17 map but were drained by the late C18. Today the boring mill pond can be identified by the dense growth of bluebells in its base. Also parts of the sides have slumped down creating a step-like feature. This is similar to what has occurred in the middle pond [08] in the main valley, [See ii. above]. The smaller pen pond [11] can be traced in the coppice.

A small pen pond [12] on the tributary has been modified by the construction of the ‘new’ road. The pen pond in Lodge Wood was not seen during this survey.

Significance

As with the main ponds the remains of the boring mill pond and the pen ponds are of high national significance due to their relationship with the water management system of the whole ironworks site. Only the boring mill pond lies within the present scheduled area. The remainder are unscheduled. As with the main ponds the pen ponds are likely to preserve undisturbed stratified deposits in the pond silts.

Management

Only the boring mill pond and its pen pond lie within the Wadhurst Park Estate ownership. The sites are undisturbed within mature coppice. The coppice should be managed to prevent it becoming over-stood. But cutting should be undertaken by hand and especially when the ground conditions are favourable i.e. not wet. Vehicles should not be used for extracting the timber.

Ideally for the other pond sites within woodland, the coppice should be managed by hand as above. Where the pond sites are now pasture, further diggings for new ponds should be avoided.

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Figure 8. The Ponds [07, 08, 09]

iv. Water courses

Linking all the ponds are streams and artificial channels. Some of which are shown on the C17 map. Others have been modified since iron working ceased. This survey has attempted to try and work out what was natural and what has been modified. In addition water was directed to the various operating equipment by the use of above ground and over head wooden launders.

Assessment

There has been significant alteration of the natural gill stream in this part of the valley probably since the medieval period. The main gill stream does not flow in its natural course until it reaches the southern end of Banky Wood, when sharp meanders re-appear in its alignment. Further downstream the course has again been modified by the mill pond for Coggins Mill. The main gill stream as it flows from the upper pond bay [04] follows a course influenced by the silting up and then draining of the main ponds. Below the bay [01] to the main pond the water course appears to have been straightened to flow along the south-eastern side of the iron working areas and to ‘capture’ the outflow stream from the boring mill. The straight flow probably encouraged a greater erosion of the stream bed and hence its deeper character. Once the stream reaches the end of Banky Wood and the start of Vicarage Wood it then follows more natural meanders.

The only observable outflow from the main pond was on the north side where the outflow was channelled beneath the old road and into a ‘leat’ [28] which flowed around the north-west side of the iron working area. This leat and the possible culvert [31] are shown on the C16 map. The channel is now a deep (2.0m approx), wide (3.0-5.0m approx) and mostly dry ditch [28]. On the north side the leat is banked by the natural slope. The leat is banked on the south side by a large earthwork bank [27]. The bank (6.0m wide at base and 2.0m at top by 2.0m high approx) then curves round to meet with the main stream. (It has been eroded at this point by the footpath). On the ground there appears to be the remains of a tail-race channel [50] in the area of the iron working site [see 3.4.3.i below]. This also appears to discharge into the main stream at this point.

A continuation of the ditch of the leat continues south-eastwards through an area of ash, hazel and alder coppice. It forms several large meanders, one of which nearly meets with the main stream – this suggests that this was once the natural course of the gill stream. This ditch (3.0m wide by 1.0m deep approx) then follows the natural slope of Banky Wood before apparently discharging into the main stream by the end of Banky Wood, probably through a culvert [31]. There is evidence of large stone blocks across the path at this point. The discharge point into the main stream is close to where the forge may have been located [See 3.4.3.ii below]. This watercourse is shown on the C17 map but no evidence of a culvert, probably because the path is not shown perhaps being a later routeway [See 3.4.5. below]. A smaller ditch [29] – a branch from the main one curves around to form a loop which also almost meets with the main stream. [See Map 2 p26 & Map 3 at end of report].

The boring mill pond had an over-spill channel [22] on its southeast side which curved round the working area to discharge into the boring mill stream before the latter then discharged into the main gill stream. Interestingly the historic OS maps show this stream discharging further up nearer to bridge on a small bend in the main stream. Topographically, this does not appear to fit although there are remains of a possible ditch [38]. The pen pond to the boring mill also had a spillway which went north to discharge into the main pond as shown on the C17 map.⁴³ It flowed just to the east of the over seers cottage, but there is no sign of this feature on the ground today.

The management of water not only included control of water to the site but also managing unwanted water to stop the working areas from becoming water-logged. The large bank [27] to the leat acted as a means of flood control to the working area of the furnace. Run-off from surface water and also upwelling groundwater may have been an issue at the boring mill, where the natural topography meant that sloping ground lay adjacent to the site. There are several ditches [18] which meet at a point before discharging into another ditch which flows past the boring site on the east side and into the main stream. These ditches are about 1.5m wide and 0.5-0.75m deep. The area is very wet. Another ditch is directed into the levelled flat area [19] to the east of the boring mill site. This ditch network is truncated on the up-slope side on the edge of the woodland. This suggests the ditches were filled in after the adjacent wood was clear-felled, in order to facilitate cultivation. The line and orientation of the ditches fits with the track way shown on the C17 map.⁴⁴ As features they may have been tracks which then were re-used for water management.

Significance

The water courses are of national significance because of their relationship with other features on the site relating to the iron working. Today, only a part of the water system is present. High-level wooden launders would also have been used to create a head of water and directed it to the overshot wheels located at the working sites.

To what extent the C16 iron works altered the natural water course or how much was re-used or ‘inherited’ from the medieval use of the water, is difficult to ascertain particularly as there appears from the documentary evidence that this valley had medieval fishponds and all the associated structures [See 2.1. above], which in turn would have also altered the water course.

Management

No active management is recommended for the water courses. It appears that only in wet weather does the leat with its associated channels flow with water. The area is partly under mature coppice. Management of the woodland should take place when the ground conditions are suitable and extraction of the timber undertaken from the site by hand not vehicles.

⁴³ ESRO AMS 5831-3

⁴⁴ *ibid*

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The main gill stream is in part eroding its banks in places and undermining the public footpath. This will need to be addressed in the future and possibly an archaeological watching brief set up prior to and during the repair works.

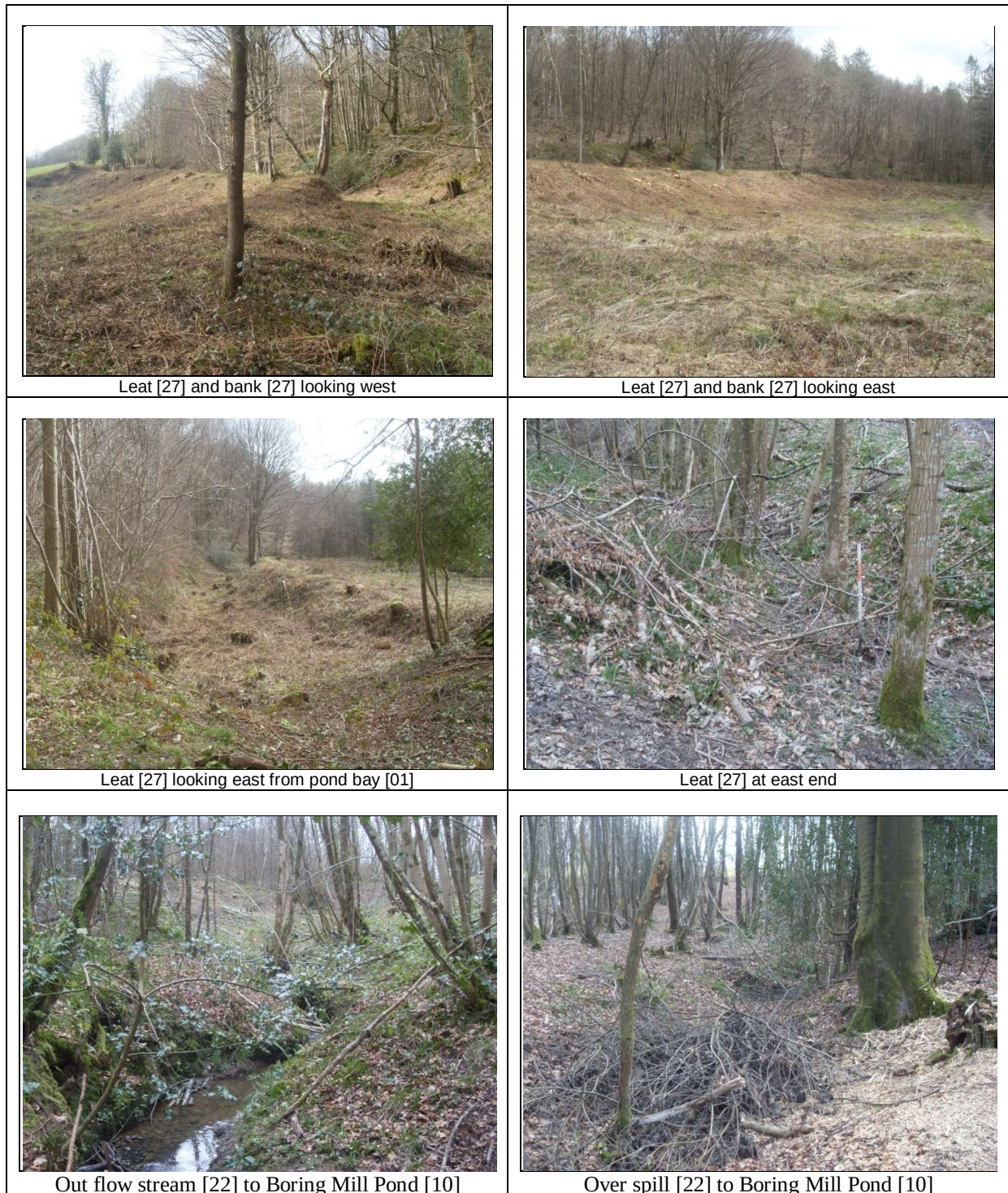


Figure 9. Water courses across and through the site

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Figure 10. Water courses across and through the site

3.4.3. The Ironworking Areas

Mayfield Iron Furnace site is a complex area of integrated iron working elements. From the start of the process with the locally dug iron stone to the export of the finished cannons and other iron products, all took place within the vicinity of each other. This would have made the process of producing cannon cost-effective. Unfortunately there is little recorded evidence in the archives of what was produced and how.

i. Site of Furnace/s [42, 43]

Assessment

The site of a furnace as shown on the C17 map locates it where the present bridge crosses the gill stream just downstream of the bay [01]. Effectively when the bridge was constructed much of the archaeological evidence for the furnace was removed. In the water lies the remains of ‘bear’ or waste by-product from the furnace – a large block of mixed stone, slag, ore and charcoal. Also lying in the water is the remains of a wooden launder. This is not in situ but possibly placed as part of the works for the bridge. On the north side of the stream is a raised platform and a sunken depression, partly damaged by a fallen tree’s root plate. This area could also be part of the furnace working area.

During a site visit discussion and examination of the site led to the identification of a potential alternative or additional furnace site in the corner between the bay and the leat (Brian Herbert pers.comm.). Here are remains of slag, together with what appears to be a tail race [50], which runs parallel with the leat. There may well have been more than one furnace built during the life-time of the ironworks, though not both working at the same time (the archives and contemporary surveys do not record two furnaces in operation at the same time). [See Appendix IV for Brian Herbert’s interpretation of the furnace site].

Significance

The site of the furnace is of national significance despite the damage already caused by the construction of the bridge. There is likely to still remain extensive below ground archaeology surviving at this site and also across the whole area enclosed by the bank of the leat. The possibility of a second furnace site is especially interesting.

Management

The part of the site of the furnace is traversed by the public footpath which is well used and gets very muddy in wet conditions. The whole area was cleared in February 2014 of scrub and flailed to a height of about 0.2m in order to facilitate this survey. It is managed as an open area within woodland to encourage song birds, flora and invertebrates. Ideally this should continue. The erosion on the footpath needs to be managed in order that it does not spread into adjacent areas during very wet conditions.

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'Bear' and launder in stream



Site of possible second furnace [42]



Furnace site from bank to leat looking NW [43]



Possible site of forge as recorded by WIRG [30]



Site of wheel pit for boring mill [44]



Boring mill [44] area after clearance work

Figure 10. The area of the Furnace/s [42, 43]

ii. Site of Forge/s [30, 48]

Assessment

The site of the forge has yet to be confirmed. It may have been positioned in the area of coppice to the south of the furnace site, where the leat appears to meander across the bottom of the valley [30]. Previous WIRG site visits have placed it in this area⁴⁵. To the south are two fields called Great and Little Forge Field.⁴⁶ Where two ditches meet the ground is raised and there is evidence of brick and tile in the locality. However, as Brian Herbert pointed out it is difficult to see how a head of water could be obtained at this point to power the forge hammers. A working forge, Finch Foundry located on the edge of Dartmoor in Devon and run by the National Trust graphically shows how water is directed to over shot water-wheels which power the forge.⁴⁷

There are two possible points along the edge of the main stream where ditches or leats may have taken water to a forge area. However field work undertaken by Brian Herbert in April-May 2014 has now identified a further potential site for the forge. This site [48] lies just downstream from where the 'culvert [31] is located on the opposite bank and in the curve of the first large meander in the main stream. There is high back-ground 'noise' on the iron detector used by Brian Herbert, the soil is very black, and the remains of a forge 'bottom' was found in the stream. Also in the stream is the remains of a possible post buried in the bed, which may have formed part of a launder structure. On the opposite side of the stream south of Banky Wood is Little Forge Field recorded on the Tithe Map for Mayfield.

Significance

Until the site of the forge is confirmed, only a provisional significance level of 'high' can be given. The whole area below the furnace site extending beyond the end of Banky Wood should be treated as being of high archaeological significance. In addition on the south side of the stream the area to the east of the boring mill and bounded by the park pale [15] should also be considered of high archaeological significance together with the whole length of the gill stream through the site and beyond the first meander.

Management

The site is currently under mature coppice, which will need to be managed at some point. This should be undertaken when the ground conditions are dry. Use of vehicles should be avoided especially over the site, with extraction by hand. Even the use of horses would cause poaching on the soft silty soils. Otherwise management should be kept to a minimum. The area of the forge [48] is used by local children for camps, fires, and building dams, so there is a certain amount of disturbance here. The site does not lie within the Wadhurst Park Estate. Given the disturbance it is recommended that perhaps WIRG conduct a trial excavation to establish the extent of below ground archaeology.

⁴⁵ WIRG Field Notes 1980-1981 pers.comm. Jeremy Hodgkinson

⁴⁶ Mayfield Tithe Map and award 1844 ESRO TDE 1330007

⁴⁷ <http://www.nationaltrust.org.uk/finchfoundry/>

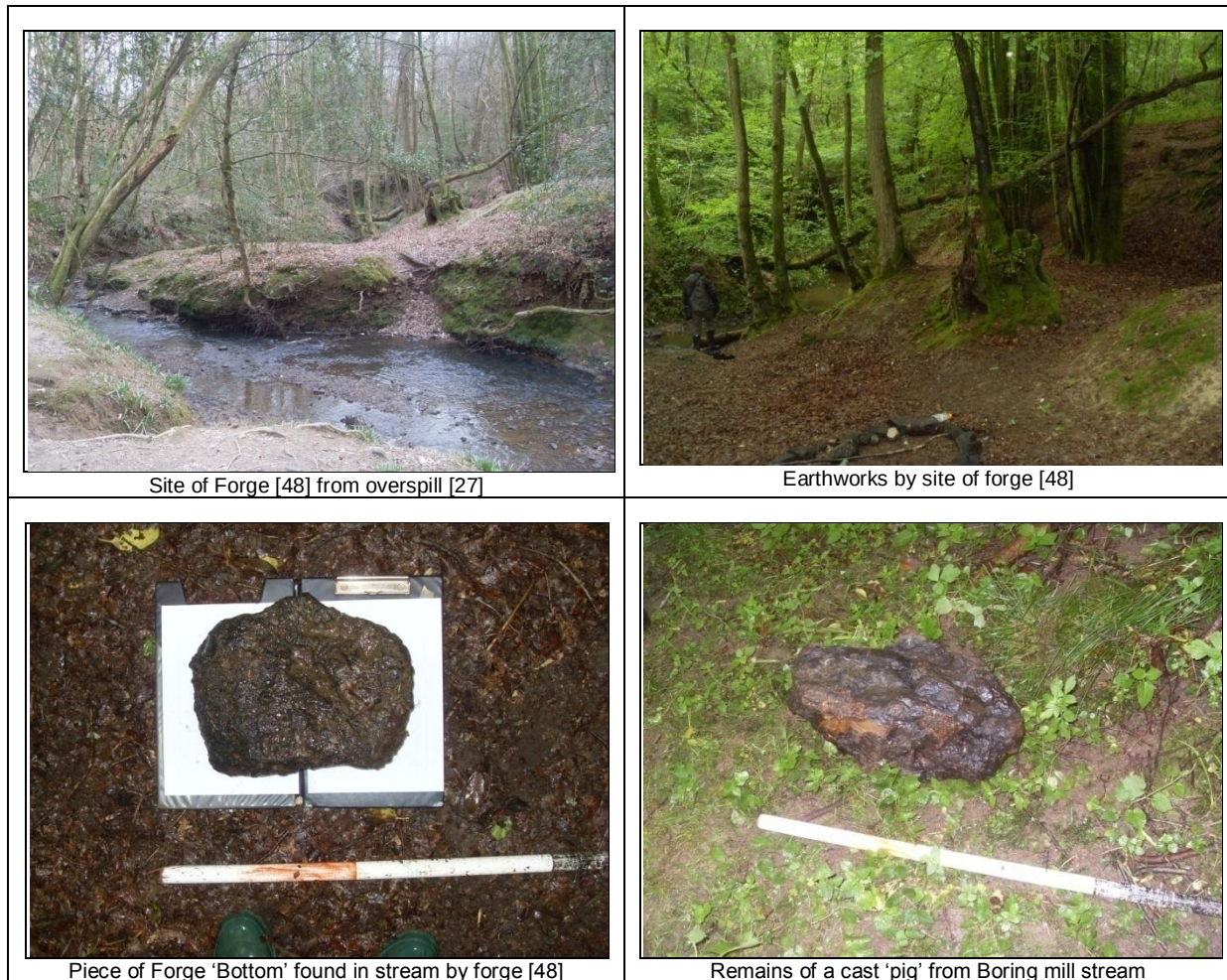


Figure 12. The area of the Forge [48]

iii. Site of Boring Mill [44]

Assessment

The boring mill together with its ponds is shown on the C17 map.⁴⁸ The mill lay just downstream of the bay. Here the ground has been levelled to a rectangular platform area. Close to the stream where it drops to form a small waterfall is a rounded area in the stream bed which may be the site of the over shot wheel. To the south is a rounded sunken area where the boring mill was sited. It is thought that an over-shot wheel powered the boring drill. The cannon would have been placed horizontally to the mill. Cannon were also placed vertically in a pit with the drill boring in a vertical position. It is not clear what method was used here or it is possibly both were employed. [See Appendix IV for Brian Herbert's interpretation of the mill].

A number of Wealden ironworks had boring mills, such as Ashburnham, Pippingford, Heathfield, Conster, Lamberhurst, Hamsell and Chiddingley where a boring bar and head

⁴⁸ ESRO AMS 5831-3

were recovered from the stream. All these mills used water from the main furnace; Mayfield is the only one with a separate water source.⁴⁹

Significance

The site is of high national significance and importance. Its relationship with the furnace site and its role in the history of ordnance working are the key factors. The undisturbed nature of the site means that below ground features are likely to survive in a good condition.

Management

This site from the pond bay to the main gill stream has been coppiced and cleared of vegetation in February 2014, in order to facilitate the survey and to reduce the threat of wind blow from over-stood coppice. This has revealed some of the more subtle features and also shows how close the mill was to the main furnace.

3.4.4. Site of Overseers Cottage [26]

Assessment

The C17 map (Figure 4b p23)⁵⁰ shows a small cottage with a chimney located on the south side of the old Coach Road in the corner of a field overlooking the Boring Mill and Furnace site. This dwelling was demolished in early 20th century. The following is an account from Tim Cornish's researches:-

Bishop Burgon, the biographer of Thomas Gresham, wrote in 1839: *It may be worth mentioning that there is a house yet standing on the ground belonging to the Palace, near the place where the furnace was, which is supposed to have been the residence of the master of the works, from the peculiar construction of an arch in the cellar.*

Bell-Irving wrote in 1903 *The old Furnace Cottage, where the foreman of the works is said to have lived has only recently been pulled down.* The house was still inhabited in the late 19th century according to the Census Returns for Mayfield.

A C16 timber-framed house still survives at Hawksden Forge giving an indication of what the cottage at Mayfield Furnace may have looked like.

The exact location of the cottage is difficult to judge today but possibly it lies in the corner of the field close to the old road/public footpath. Here there are several earthworks, whilst just beyond the fence to the east in the woodland are several areas of stone and brick.

Significance

The site of the cottage is of high significance due to its recorded history and its relationship with the Furnace. It is likely that the cellar still survives below ground, together with other stratified deposits, such as a midden, an outside closet, etc. The site probably lies just on the boundary of the present scheduled area.

⁴⁹ See Cleere and Crossley 1995. p260-261 for details on how boring mills operated.

⁵⁰ ESRO AMS 5831-3

Management

As with all heritage features minimal disturbance is important. Avoid siting extraction routes over or near this site, avoid disposing of brash on it and avoid stock piling timber or wood on it. In the future also avoid any replanting over it. Management of the coppice should be undertaken when the ground conditions are suitable.

3.4.5. Access to the ironworking site

This detailed topographical survey has enabled the site to be examined in its wider landscape context. Access to and from the site is important to consider, both for workers, raw materials and finished product.

Assessment

According to Tim Cornish the main route north from Mayfield was along the lane past Coggins Mill to Lake Street. It was then replaced by The Old Coach Road at the time of the construction of the ironworks with the route going across the top of the pond bay. It is shown on the C17 estate map for Mayfield Place Farm.⁵¹ When the furnace fell out of use in the C18 and the bay was breached the road went through a ford adjacent to the dam.⁵² This turnpike road was in use in the middle of the C18.⁵³ The bridge and culvert across the stream carrying the Old Coach Road was probably constructed in the early C19 destroying what remained of the furnace. Little Trodgers Lane was then constructed to replace the old road and a culvert and bridge was constructed across the pond bay [05] between the lower [09] and middle [08] ponds. This route was constructed around 1830 as it is shown on the Tithe Map for Mayfield dated 1843 but not on the map in Horsfield's *Antiquities of Sussex*. It was constructed using unemployed labour. The old coach road fell into decay (although still referred to as The Old Tunbridge Wells Road)⁵⁴ and used as a farm access track and footpath. Today the route is a public footpath and survives as a sunken hollow way.

Interestingly the foot path from the site of the furnace which follows the edge of the gill stream and thence to Coggins Mill does not appear on the C17 map, nor on the Tithe Map of 1843. It first appears on the Ordnance Survey 25" 1st edition c. 1860. This is strange as one might have expected this to be a route linking the ironworks site with the hamlet of Coggins Mill.

A track which is shown on the C17 map is one which runs from the site of the boring mill south through Brickhurst Wood alias Vicarage Coppice to then join with the lane by the Old Palace. The present public foot path follows part of its course at the southern end. At the northern end the public footpath follows a line to the northwest to cross the boring mill stream just below the pen pond bay [06]. It is possible that the group of ditches [18] are the remains of this track or path but which have also been subsequently used as a means of

⁵¹ ESRO AMS 5831-1

⁵² Tim Cornish pers. comm.

⁵³ Bell-Irving

⁵⁴ Bell-Irving 1927 Recollections

controlling ground water flow away from the active area of the boring mill. The clear felling of the woodland to the south and subsequent ground works has removed much of the evidence of this track way. This route may be older than the furnace site. In the medieval period, it could have been a means of reaching the fish ponds from the Archbishop's Palace.

It is not clear what the domestic arrangements were for the workers at the furnace. Probably most were accommodated in the village of Mayfield and adjacent hamlets. The route to the boring mill is one which workers living in Mayfield possibly would have taken and also the haulage of cannons from the site, if they were perhaps being exported from the Sussex coast, instead of going to London.

Significance

The routeways are of high significance not only for the 'story' they tell of how the site was accessed and used, but also for the provision of access today for the public.

Management

The site of the old track / ditches [18] should remain undisturbed. The wet ground conditions mean that the site is very susceptible to erosion. Management of the trees and extraction of timber should be undertaken with care.

3.4.6. Other features

There are across the site area a number of other features and earthworks, which may relate to the iron works or post-date its operation.

i. Charcoal Hearths [32, 36]

Assessment

Charcoal hearths or platforms are levelled, circular features usually cut into sloping ground, close to water in areas of old coppice. These were sites, frequently reused by burners, to build the charcoal clamp on. The clamp comprising faggots of underwood were built into round mounds, over which a turf or soil cover was made, to seal the clamp. Through a hole built into the top a burning faggot was dropped and the clamp allowed to 'burn' for several days. It was carefully controlled to limit oxygen, driving off the sap and tannins and leaving the carbonised wood. Once cooled the charcoal was carted to forges and furnaces. This charcoal would when re-lit burn at a much higher temperature and thus was invaluable source of fuel for the iron industry. Charcoal was made both in the woodland and also at the furnace and forge sites. Adjacent to the charcoal hearth would be another levelled area where the burners hut would be. Charcoal burners would manage more than one hearth probably keeping a regular production going for the ironworks. Charcoal continued to be produced in the C17 to late C19 as a fuel for other industries. It was also used as a water purifier and in the First and Second World Wars charcoal was used in gas masks. Good quality charcoal was also used for drawing by artists.

Within Banky Wood are two hearths or platforms [32, 36]. These are levelled into the slope one at the east end and one at the west end overlooking the leat / overspill [27] channel from the main pond bay [01].

Significance

These earthworks are of importance as part of the wider landscape used by the ironmasters working the Mayfield Forge and Furnace. They also have a direct relationship with the woodland and how it was used in the past. Hornbeam, Oak and Ash were all coppiced for charcoal, and there is still some hornbeam coppice within the wood. Whether these hearths are contemporary with the iron works or were in use in the C18 and C19 is not clear.

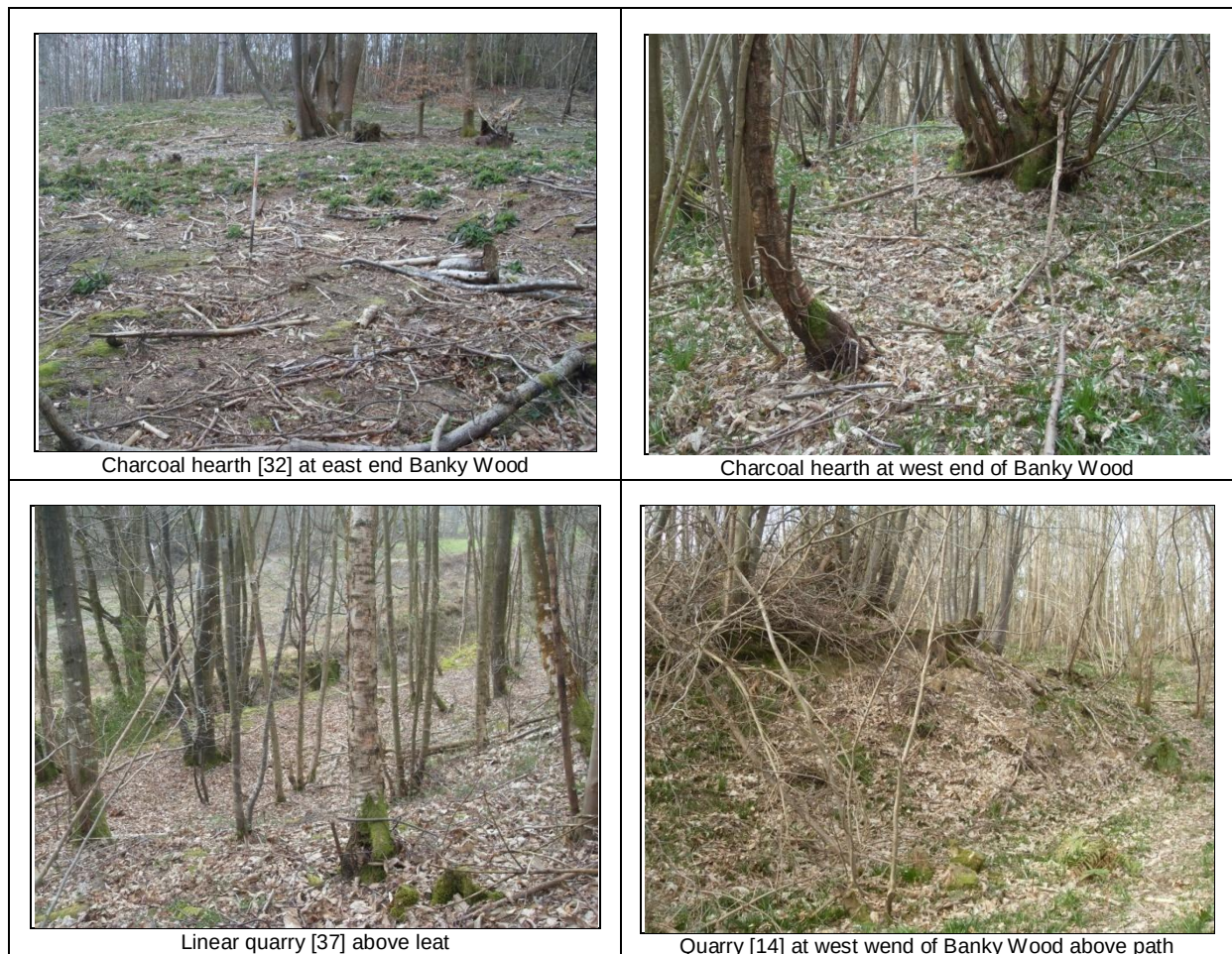


Figure 13. Charcoal hearths and quarries

Management

Charcoal hearths are very fragile and those that survive probably date from the more recent periods of iron production, or more probably even later. When sweet chestnut coppice was planted – these sites were often planted over, but where hearths survive in hornbeam and other coppice, they are often free of mature trees. As with all heritage features minimal disturbance is important. Avoid siting extraction routes over or near them, avoid disposing of

brash on them and avoid stock piling timber or wood on them. In the future also avoid replanting over them.

Care should also be taken when carrying out work throughout the wood at its western end as more hearths may still lie unrecorded in the denser undergrowth.

ii. Quarries

Iron stone for the furnace was probably quarried and taken from the large pits in the surrounding woods in Mayfield. For example, Heronry Wood lying to the north has some significant large quarries at its western end. The ore would have been carted in from a distance probably along the old coach road. However, other materials were needed in the iron smelting and casting process, such as stone for building the furnace and associated structures, sand and clay for the bays, for the moulds and other uses. These would have been quarried locally and possibly exploiting the exposed bedrocks along the valley.

Assessment

Within Banky Wood are two areas of possibly quarrying. One above the track from the old coach road along the north edge of the wood [14] and another [37] just above the over spill from the main pond. The latter follows the line of slope creating a linear platform above the leat.

Another possible quarry lies to the north west in the field above the gill stream. This again is a linear quarry but dug into the slope and running parallel with Little Trodgers Lane. This may have been dug for material for the new road.

Significance

These quarries form an integral part of the management of the ironworks, as a source of raw materials either for construction or for the up keep of the furnace or for making the moulds. Thus they are of high significance.

Quarries are a common feature of the Weald occurring in most woods and gills but it is the association of these quarries with the nationally important ironworks site which raises their significance.

Management

As with all heritage features minimal disturbance is important. Avoid siting extraction routes over or near them, avoid disposing of brash on them and avoid stock piling timber or wood on them. In the future also avoid replanting over them.

4. Interpretation of Level 1 and Level 3 Survey

The survey has revealed the complexity of the Mayfield Ironworks and the good survival of the main and associated features. The works were in use over a period of at least 100 years. The main period of maximum operation was probably in the C16 when the site was used to produce cannon. The pond bays, ponds and leat are well preserved and give an indication of the extent of the works. What has become apparent is the complexity of the management of the water needed to power the various bellows and hammers. Getting water around the site appears to have been achieved using a network of wooden launders working in conjunction with tail-races and ditches. The presence of wooden launder in the stream shows that they were used but of course the wooden structures have long since disappeared. The present course of the stream follows an artificial and straight line thus eroding a deeper bed than expected for the size of the valley. Today the stream is trying to develop natural meanders as seen by the erosion of the bank into the footpath. This is now exposing further archaeological remains in the stream bed, in particular the probable site of a forge.

The site of the furnace as recorded in 1663 was destroyed when the present bridge was erected across the stream to take the footpath. But the earthworks below the main bay suggest that there may have been another furnace at the northern end of the bay [Brian Herbert pers.comm.]. There is a slight depression, together with a slag heap and a possible tail race.

The two surveys have also revealed that the site of the boring mill is far more complex than first recorded and also of a much greater extent. The remains of low banks suggest small enclosures either for stock or for areas of other related industries such as wheel-wrights, farriers etc. The areas enclosed may preserve below ground archaeology. The complex of ditches to the southeast of the main boring mill bay are evidence of further water-management together with the remains of a possible hollow way to the site.

It has not been possible to work out any phasing in the development of the site from the relationship of the earthworks. This would probably only be achieved through excavation.

4.1. Reassessment of monument

The two surveys together with the contributions made by Tim Cornish and Brian Herbert have enabled a reassessment of the importance of the monument.

4.1.1. Context

Mayfield Ironworks remains a site of nationally importance. It was an ironworks developed for the production of armaments. From this site Sir Thomas Gresham produced significant tonnage of cannon both for the Crown and also for export to allied countries. With subsequent owners it was then used for more domestic use. This ironworks is only one of several in Mayfield [See Table 2]. Hawksden Forge was also producing armaments, the owner Colonel Herbert Morley was a staunch parliamentarian and may have supplied the 'Model Army' with ordnance.

Mayfield Ironworks earthworks and features are almost complete – lying at the headwaters of the Little Rother. Thomas Gresham as owner of the Manor of Mayfield with its lands, was able to set out numerous pen ponds as water reservoirs to power the forge and furnace. Many of these pen ponds still lie well preserved within the gill woodland in the upper valleys, for example, Lodge Wood and Ashurst Wood.

4.1.2. Boundaries of scheduled area

Although it was not an objective of this survey to redraw the boundaries of the SAM, it is suggested here that if and when an opportunity arises the boundary should be enlarged to capture the whole of the ironworking area. Also all the pond bays surviving in the head water valleys should ideally be included like the bay between the upper and middle pond. The headwater valleys and their gill woodlands should all be considered an integral part of the ironworks site.

5. Conclusions

To conclude from this archaeological assessment Mayfield Ironworks remain of high national importance. The survey has revealed that the site is far more complex than it first appears. The detailed examination of the site by Brian Herbert of WIRG, to which the author is indebted, has located a new site of a forge together with potential of two furnace sites. In addition the Level 1 survey has shown that there are subtle earthworks surrounding the immediate working area, which may be the remains of other related activities.

The significance of the site has also increased due to its location within a medieval deer park belonging to the Archbishops of Canterbury. It is very likely that this part of the valley was the site of the nine acres of medieval fishponds and perhaps it was these water features that encouraged Thomas Gresham to establish his ironworks here. The pond bays may have been rebuilt or enlarged from the earthworks for the fishponds.

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Witney, K.P. (1976) *The Jutish Forest. A study of the Weald of Kent from 450 to 1380 AD*.
Athlone Press.

7. Maps relating to the area of Mayfield Ironworks

DATE	LOCATION	REFERENCE	DESCRIPTION
n.d. c.1663	The Keep	ESRO AMS 5831-3	Map of Mayfield Place Esatate owned by John Baker of Bungehurst and Mayfield Place
1724		Margery 1970	Richard Budgen Sussex 1"-1 mile
1795		Margery 1970	Wm Gardner & Tm Gream (partly after Yeakell and Gardner) Sussex 1" to 1 mile
c.1797	BM		Ordnance Surveyor's Draft Drawings for 1" 1 st Edition
1813		Margery 1970	OS Old Series 1" to 1 mile
1825		Margery 1970	Christopher and John Greenwood Sussex 1" to 1 mile
1840	The Keep	TDE 133	Tithe Map for Mayfield
1875	The Keep	OS Sheet 29/1	Surveyed 1874 OS 25" 1 st Edition
1898	The Keep	OS Sheet 29/1	Revised 1897 OS 25" 2 nd Edition
1908	The Keep	OS Sheet 29/1	Revised OS 25" 3 rd Edition
1929	The Keep	OS Sheet 29/1	Revised Edition

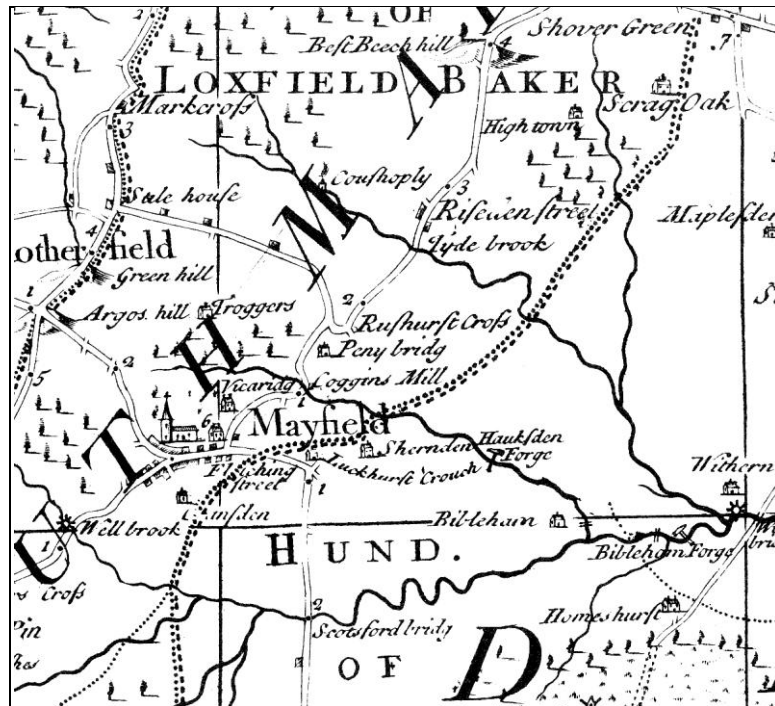


Figure 14. Richard Budgen 1724 Sussex 12 to 1 mile

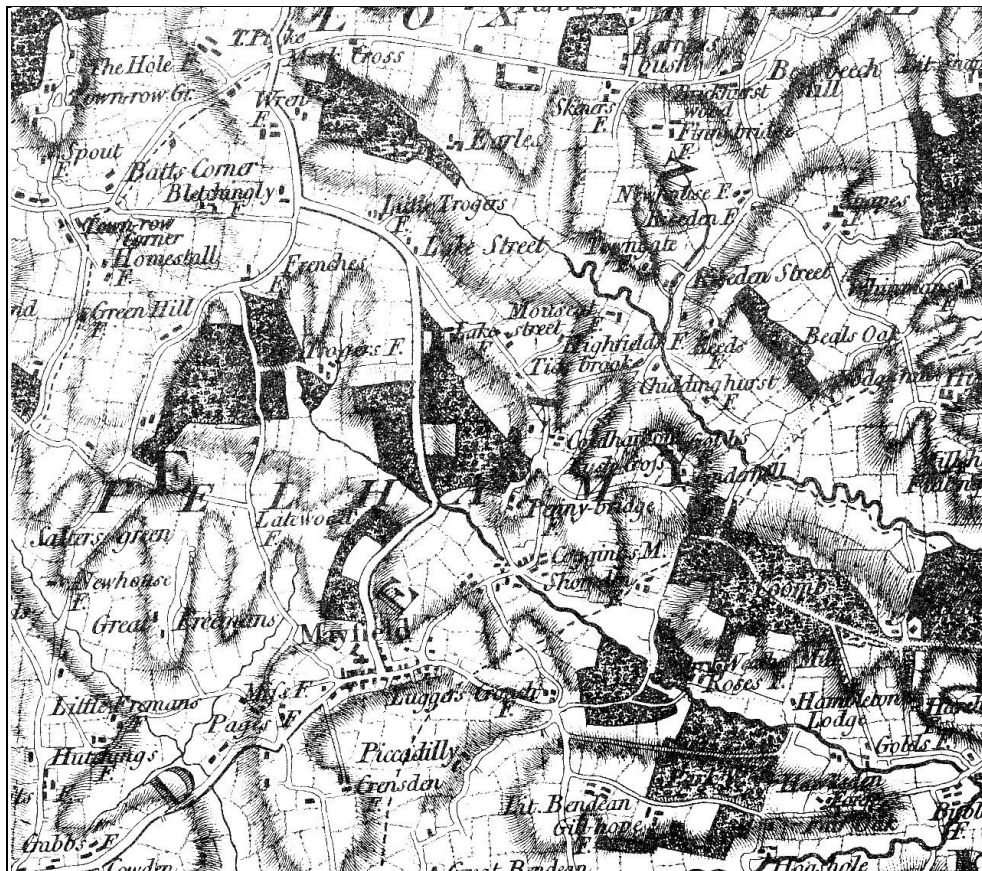


Figure 15. William Gardner and Thomas Gream 1795 Sussex 1" to 1 mile
after Yeakell and Gardner



Figure 16. Ordnance Surveyor's Draft Drawings for 1'' 1st Edition

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<http://www.bl.uk/onlinegallery/onlineex/ordsurvdraw/b>

MAYFIELD IRONWORKS
LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD



Figure 17. OS Old Series 1813



Figure 18. Christopher and John Greenwood 1825 Sussex 1" to 1 mile



**MAYFIELD IRONWORKS
LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD**

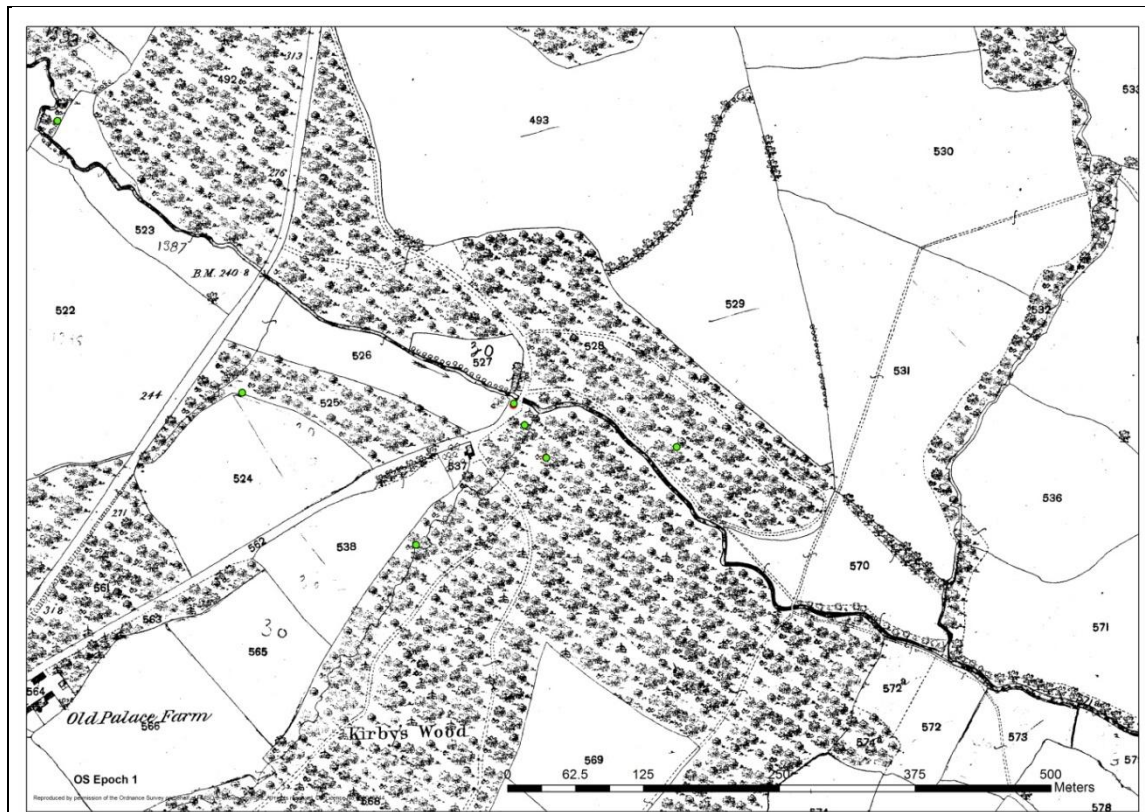


Figure 20. OS 25" 1st Edition 1874

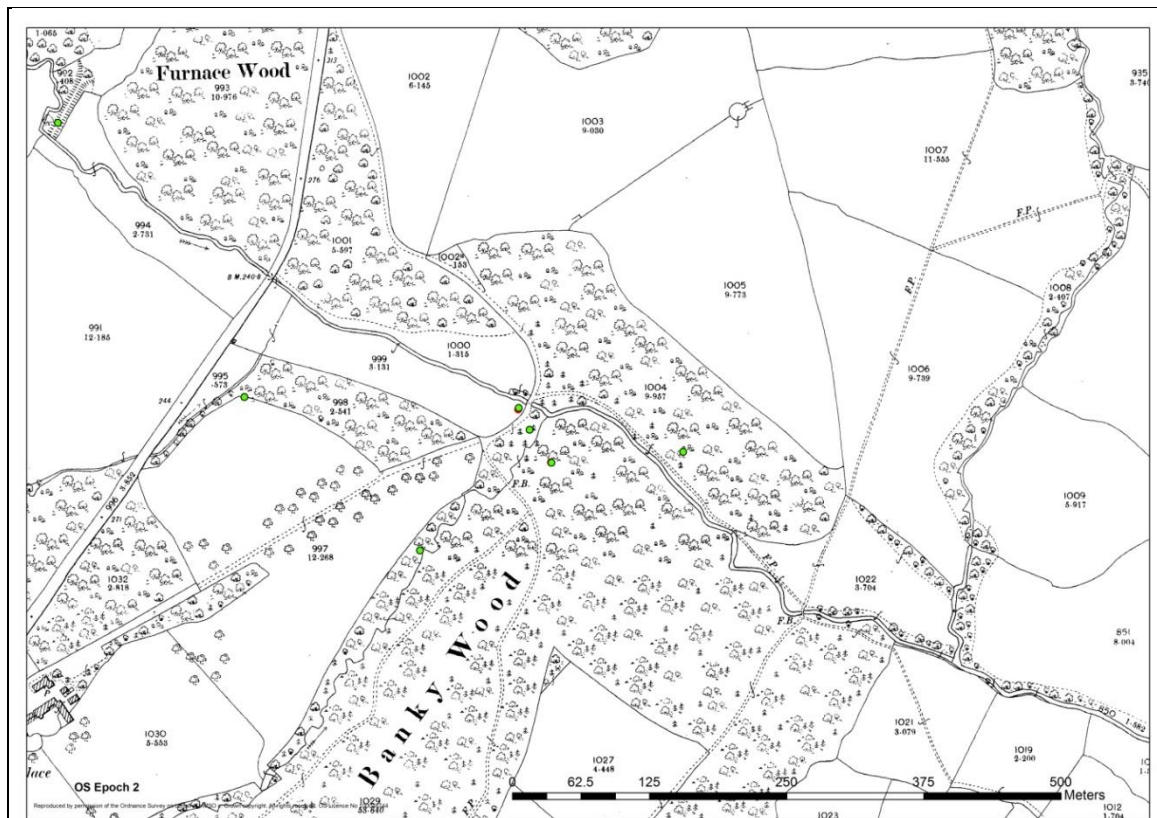


Figure 21. OS 25" 2nd Edition 1897

APPENDIX I

WEALDEN IRON
RESEARCH GROUP
DATABASE



www.wirgdata.org

<http://www.wirgdata.org/searchsites2.cgi>

Site Name:	Mayfield Forge	Parish:	Mayfield
District:	Wealden	River Basin:	Rother
County:	East Sussex	OS Reference:	TQ 5940 2810
Site Type:	Forge	Period:	
Century:		Earliest Date:	
Latest Date:			
Dating evidence:			
Site Description:	Bay: Dual use with Mayfield furnace. Water system: Leat, now dry, originating from the extreme N end of the furnace pond bay runs in partly banked channel for c.170m before joining stream. Just before stream is reached, and N of public footpath, another dry channel loops round to join stream 45m further downstream. Wheelpit may be in this area. Working area: Probably within loop. Forge-type cinder and forge bottoms occur in stream at this point, but not immediately upstream. Section exposed in N bank shows filled-in hollow with charcoal, slag and roof tiles at base, 150m downstream on N bank are Great and Little Forge Fields (Mayfield Tithe Award).		
Scheduled Monument Number:		CLBR:	No
HER Reference:		Samian pottery:	No
Bloomery admin.:	No	Gun Foundry:	No
Sickle mill:	No	Wire mill:	No
Bay Height (m.):		Bay Length (m.):	
Excavation?:	No		
Excavation Details:			
Lab Analysis of Residues:			
Geology:			
Description of site vegetation:			

**MAYFIELD IRONWORKS
LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD**

**Slag Heap
Area (m. sq) :**

**Slag heap
grade
(Hodgkinson
Scale):**

**Persons
Involved in
Discovery:**

**Cylindrical
slag plugs:** No

References: **Cleere, H. F. and Crossley, D. W..** (1995) The iron industry of the Weald. Merton Priory Press. Cardiff
(for this site see page(s) 343-4)

**Persons with
known
connections to
this site:**

Site Name:	Mayfield Furnace	Parish:	Mayfield
District:	Wealden	River Basin:	Rother
County:	East Sussex	OS Reference:	TQ 5930 2820
Site Type:	Furnace, Boring Mill	Period:	Modern
Century:	16, 17	Earliest Date:	1572
Latest Date:	1664		
Dating evidence:	Schubert 1957:381 refers without citation to ironworks on the Archbishop of Canterbury's lands at Mayfield in 1545, but these were not necessarily this furnace. Thomas Gresham was working the furnace by 1572, a letter of March in that year referring to 'Mr Danyell' his founder, who was leaving his employ. It is referred to in Hogge's petition of 1573 as casting guns, and was licensed to export cannon in 1574 (TNA SP 12/95/62) and 1578 (HMC Hatfield, V, pt 2:216; Bell-Irving 1903:59, 175-6). He was listed as owner in 1574. In 1597 Thomas May bought Mayfield Manor with the furnace from Sir Henry Neville, who had inherited it from Gresham (but who probably did not become actively involved with the site until about 1585). Earlier suggestions that Barnabe Hodgson (q.v.) was working there between about 1599 and 1609 (TNA E178/4143) have now been shown to relate to Maresfield. John Baker was the next purchaser in 1617. The furnace is listed as working in 1653, and repaired in 1664. See a map of the lands of John Baker c.1653, on which the furnace is shown (ESRO AMS 5831).		
Site Description:	Bay: L 110m H 2m/2.5m Breached by stream near SW end. Disused Mayfield-Tunbridge Wells road (old coach road) runs along SE side of bay and cuts through it's NE end, displaced soil being banked on SE side of road. Water system: Pond dry. Prominent banked dry channel, originally from extreme NE end of bay, probably leat to forge site downstream. Remains of lesser channel to S may be furnace spillway. Wheelpit probably on site of present stream. Pen pond with bay at TQ 5880 2840 and another with bay on line of present road at TQ 5900 2820 and TQ 5880 2810. Working area: Partly destroyed by old road. Levelled platform just downstream of bay, above left bank of stream, from which bricks and stones are		

**MAYFIELD IRONWORKS
LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD**

	being eroded. Scatter of glassy slag all over area, especially at SW end. Partly submerged bear just downstream of present bridge, and part of wooden trough near right bank.		
	Boring Mill: Tributary on SW side joins main stream 110m downstream of bay. On this tributary is secondary bay (L 60m) with spillway at SE end, breached by present stream. Immediately downstream of breach, on right bank, is small level platform and in stream are large stone blocks apparently part of a structure. Downstream, the banks have scatter of broken cannon mould and boring swarf. Pen pond at TQ 5910 2800.		
Scheduled Monument Number:	SX 401	CLBR:	No
HER Reference:		Samian pottery:	No
Bloomery admin.:	No	Gun Foundry:	Yes
Sickle mill:	No	Wire mill:	No
Bay Height (m.):	2.5	Bay Length (m.):	110
Excavation?:	No		
Excavation Details:			
Lab Analysis of Residues:			
Geology:			
Description of site vegetation:			
Slag Heap Area (m. sq) :		Slag heap grade (Hodgkinson Scale):	
Persons Involved in Discovery:			
Cylindrical slag plugs:	No		
References:	Burgon, J. W.. (1839) The life and times of Sir Thomas Gresham vol. 2. Robert Jennings. London (for this site see page(s) 425-6) Straker, E. (1931) Wealden Iron. Bell. London (for this site see page(s) 292-3) Schubert, H. R.. (1957) History of the British Iron and Steel Industry. Routledge. London (for this site see page(s) 381) Cleere, H. F. and Crossley, D. W.. (1995) The iron industry of the Weald. Merton Priory Press. Cardiff (for this site see page(s) 344) Bell-Irving, E. M.. (1903) Mayfield: the story of an old Wealden		

MAYFIELD IRONWORKS
LEVEL 1 & LEVEL 3 SURVEY
CORE MONUMENT RECORD

village. William Clowes. London
(for this site see page(s) 58, 141-2, 159-60)

Crossley, D. W.. (1975) The Lists of Furnaces and Forges of 1664.
Wealden Iron, Bulletin of the Wealden Iron Research Group. First
series, 8. pp. 2-7
(for this site see page(s) 3)

Persons with known connections to this site:	Baker, John - Owner/ironmaster 1668-? Baker, John - Owner/ironmaster 1617-68 Gresham, Thomas - Owner bef 1570-1579 James, Abraham - Ironworks manager in 1595 May, Thomas - Owner 1597-1617 Neville, Henry - Owner c.1585-1597 Neville, Henry - Owner 1579-c.1585
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<http://www.wirgdata.org/searchsites2.cgi>

APPENDIX II

HER Entry for Mayfield Furnace

SMR Number TQ 52 NE10 -	Site Name C16 furnace	
SMR Number TQ 52 NE10 - MES4611	Site Name C16 furnace	Record Type Monument

Remains of a series of pond bays. Probably part of the site of Mayfield iron works. Noted as working and exporting cannon c.1574. Last recorded as working in 1653.

IRON WORKS (Post Medieval - 1540 AD to 1900 AD)

POND BAY (Post Medieval - 1540 AD to 1900 AD)

Description

(TQ 593282) 51 deg 1' 50" N; 0 deg 16' 20" E. Mayfield Furnace, 3/4 mile NNE of the church, was owned in 1574 by Sir Thomas Gresham. It was working in 1653 but was discontinued before 1664. It was a very important iron works, and made exported cannons. On the left of the new bridge over the furnace stream are remains of huge slag heaps, below which was the hammer pond. The ponds are now drained and the bays gone, but there is still slag. (1) There are two pond bays, one across the furnace stream at TQ 59252814, and the other, at right angles to it, across a tributary stream at TQ 59282809. Both are breached midway by the streams, and both contain glossy furnace slag. The latter bay has a spillway round the southern end. Between and below the bays at TQ 59262812 is the site of the furnace itself, an area of black earth containing a lot of charcoal and some slag. Along the south side of the new-dug western pond, are a number of artificial mounds, but they are entirely under grass and their composition could not be determined. Within the woods to the E of the bays are numerous mine pits. Upstream from both furnace ponds were pen ponds, new dug, but the bays remain, a large and high one at TQ 58832840, with a spillway at the N. end, and breached towards the S. end by the stream, and a small bay at TQ 59162801, breached at the E. end by the stream. Pondbays surveyed at 1:2500. (2)

Sources

- (1) Article in serial: Wealden Iron, 1931, 292 (E Straker)
- (2) : Ordnance Survey Archaeology Division Field Investigators Comment (in DESCRIPTION above) . F1 ASP
29-OCT-69
- (4) Survey: Field report on TQ 52 NE 10 - 17-DEC-1969 . 1:2500.

National Grid Reference

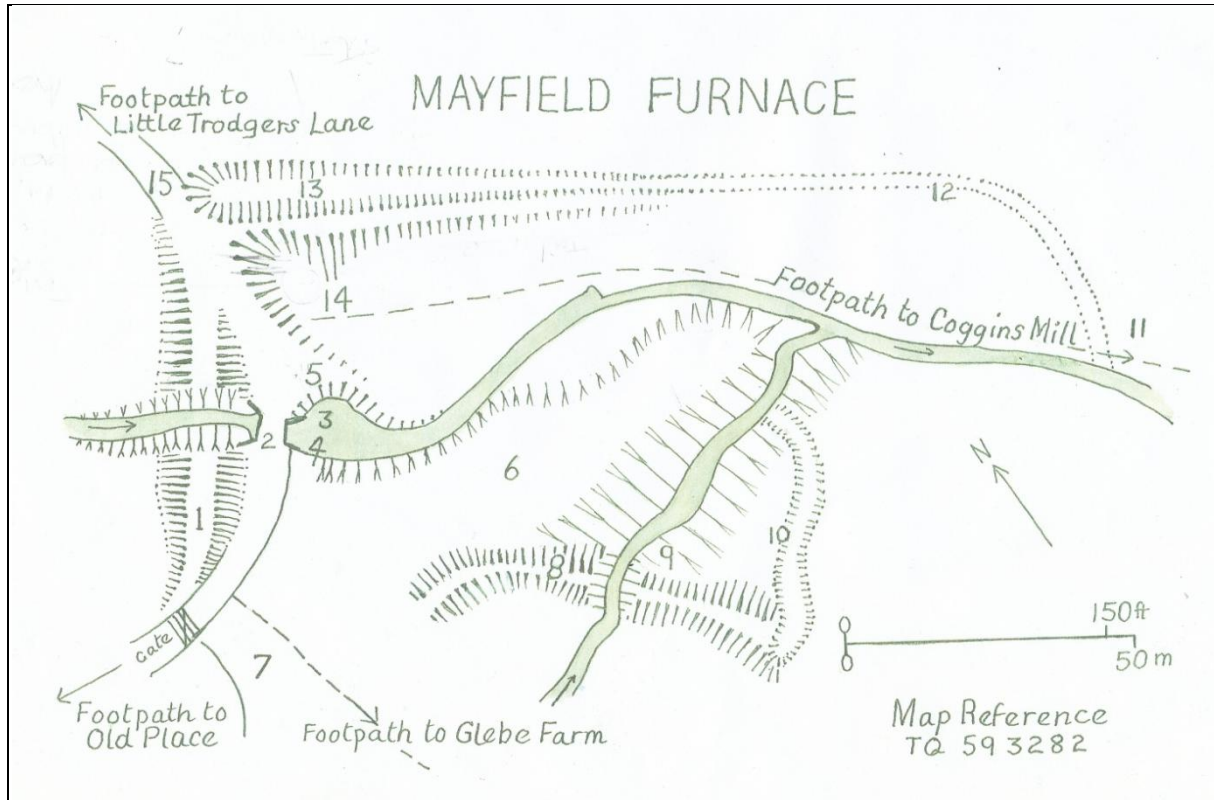
Centroid TQ 5916 2815	TQ52NE	Dispersed
-----------------------	--------	-----------

Administrative Areas

Civil Parish	Mayfield, Wealden, East Sussex
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APPENDIX III

Sketch-plot of features produced by Tim Cornish as part of the research for the information board
[Compare with the Level 1 and Level 3 Maps]



APPENDIX IV

Mayfield furnace and forge.DOC Brian Herbert WIRG 12-4-2014

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MAYFIELD FURNACE AND FINERY-FORGE & BORING MILL

SUGGESTED FURNACE LAYOUT FOR MAYFIELD BLAST FURNACE

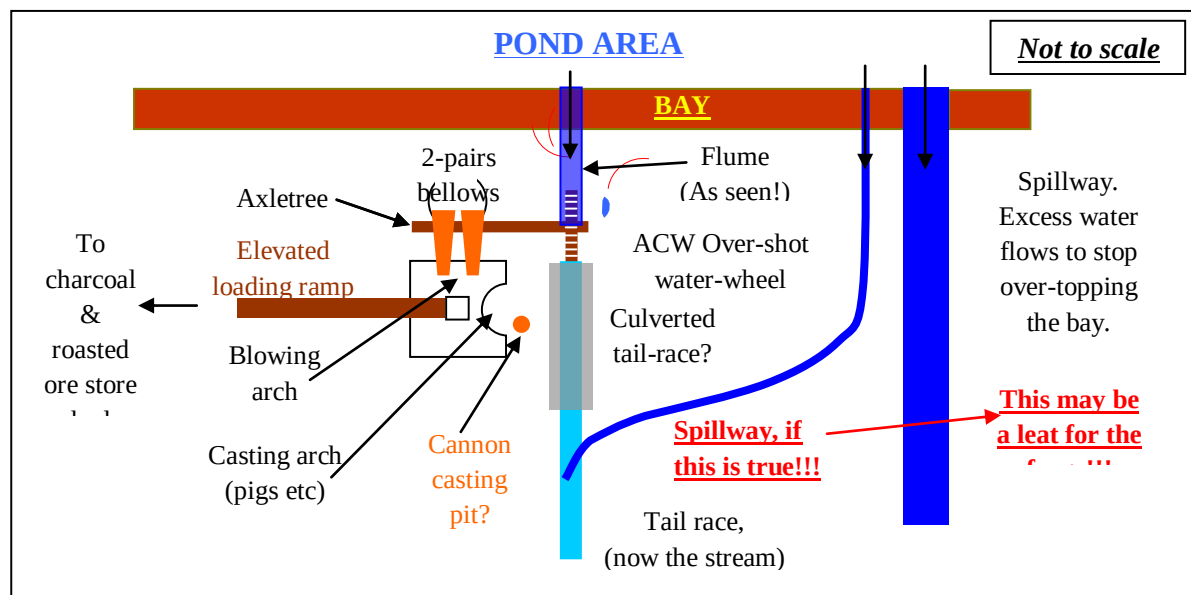


Fig.1, ENVISAGED BLAST FURNACE AREA FOR MAYFIELD

THEORY OF PROCESSES ASSOCIATED WITH THE BLAST FURNACE

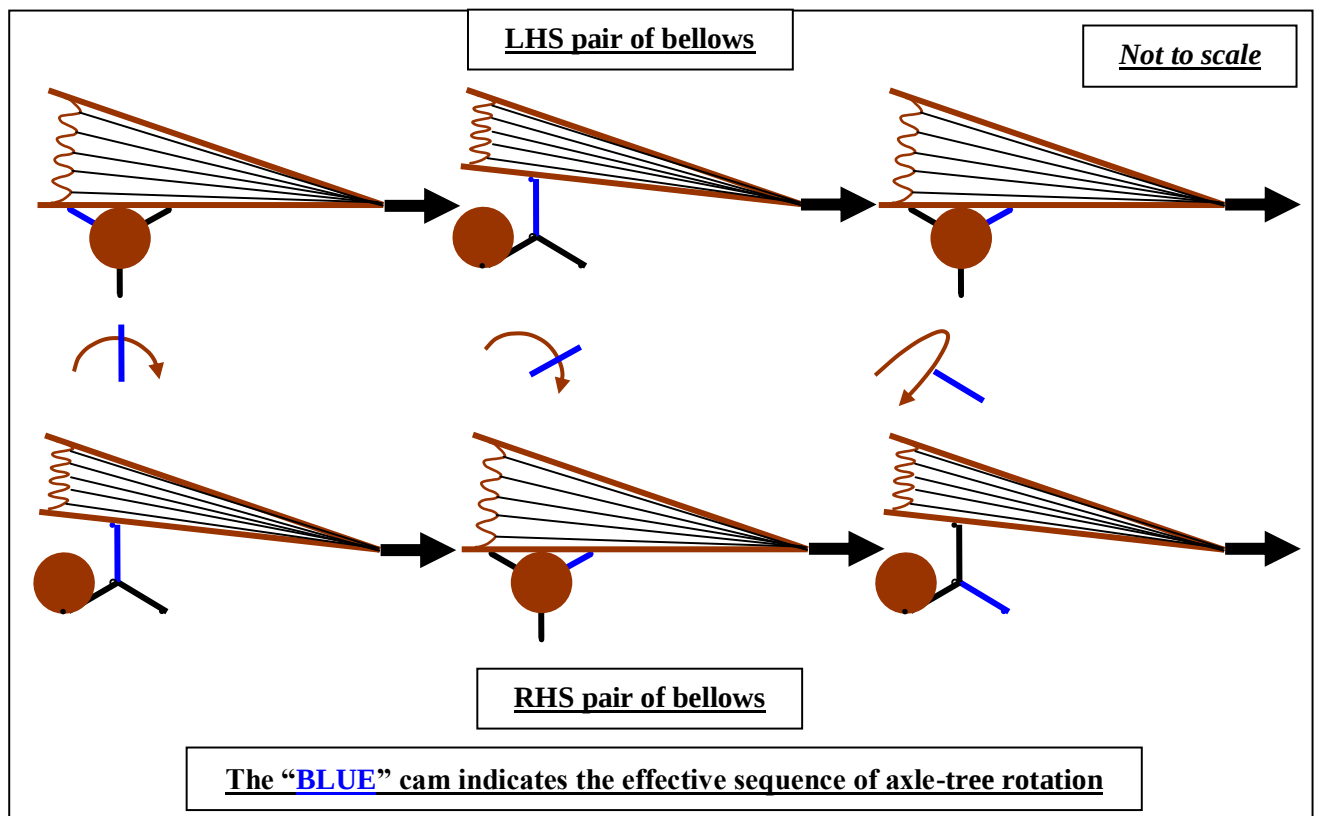
BELLOWS OPERATION FOR PAIRS OF BELLOWS

The cams on the axle-tree must rotate in the direction shown in Fig.2; rotation in the opposite direction put's excessive strain on the cam because it is “lifting” the centre of the bellows board, rather than the end.

The cams, for one bellow, are space at 120-deg intervals whilst for the second bellow the three cams are spaced 60-degs apart from the first bellow.

The bottom board of the bellows is lifted by the axle-tree cams whilst the top board is fixed (not shown).

The diameter of the axle-tree defines the optimum length of the cams, hence the height that the bottom board lifts; the larger the axle-tree diameter the longer the cams may be, noting that when the bottom board rests on the axle-tree, adjacent cams just touch the bottom board.



**Fig.2, LEFT TO RIGHT SEQUENCE OF AXLE-TREE AND BELLOWS
OPERATION**

**NOTE THAT THE TWO BELLOWS ARE OUT OF SEQUENCE BY 60deg
THIS GIVES AN “ALMOST” CONSTANT BLOWING RATE**

In reality, the cams will not be this thin and a more substantial one would have been mortised into the axle-tree, Fig.3.

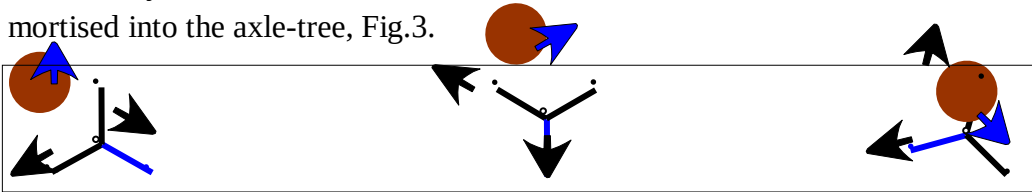
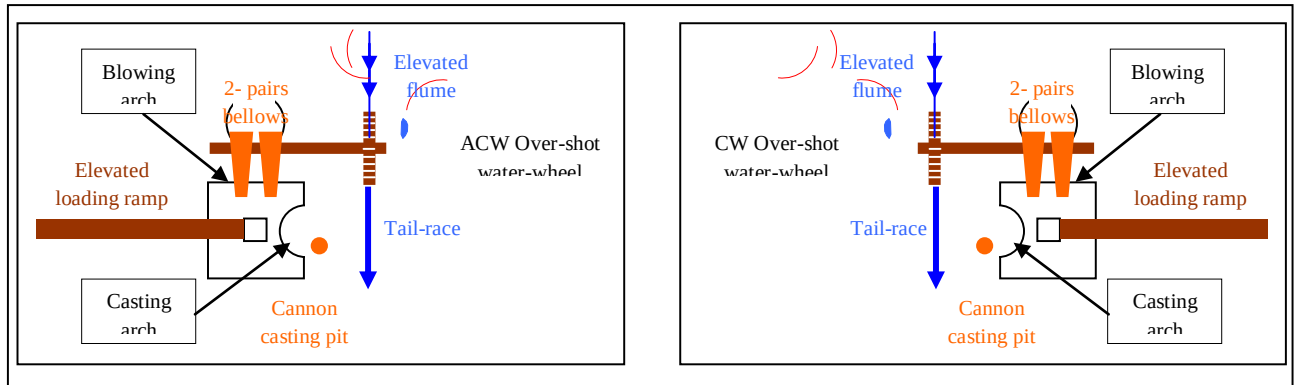


Fig.3, A MORE PRACTICAL METHOD OF MAKING THE BELLOWS CAMS

GENERAL BLAST FURNACE LAYOUT

The blast furnace layout is limited to two situations, Fig.4, because of fundamental limitations that have been discovered by excavation [should a long flume be used these arguments do not necessarily apply]: -

- 1) The water-power for 2-pairs of bellows comes from an over-shot water-wheel coupled to a long axle-tree, Fig.1. A typical water-wheel is 12-ft diameter and 1-ft wide.
- 2) To raise a stream's height to enable its water to flow onto the top of the water-wheel requires a bay across a valley.
- 3) The bay will not be 12-feet high because about 4 to 5-feet of the water-wheel is within a wheel pit.
- 4) A man-made or natural earthen bank, at right-angles to the bay and adjacent to the furnace, Fig.3, produces an elevated “loading ramp” to allow charges of roasted ore and charcoal [stored nearby in sheds?] to be tipped into the centre of the furnace (via an approximately 1-foot square hole).
- 5) Because there is limited access between the earthen bank at right-angles to the bay, see above, it is not practical to have the “tapping arch” on this side of the furnace.
- 6) The “blowing arch” and “casting arch” seem always to be adjacent to one another.
- 7) Thus there only two possible furnace layouts Fig.4a & Fig.4b.
- 8) The rotational directional of the water-wheel should be such as to lift the “end” of the bellows, i.e. not start lifting from the centre of the bottom bellows board. This is shown by the ACW or CW direction of the water-wheel, Fig.4.



**Fig.4a & 4b, THE TWO POSSIBLE FURNACE LAYOUTS
PROVIDING THE FLUME WAS SHORT**

THE BORING MILL

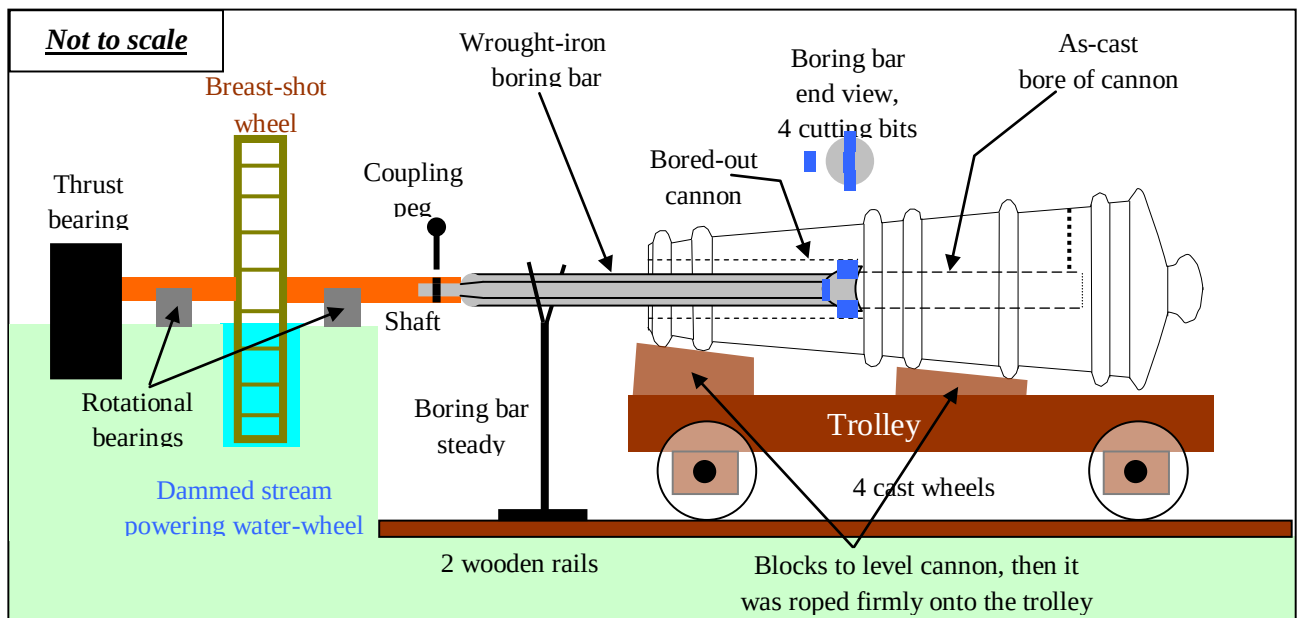


Fig.5, DIAGRAM OF THE BORING MILL IN OPERATION

**DEVELOPED FROM A WEALDEN BORING BAR AT ANNE OF CLEVES
MUSEUM, LEWES**

Wealden cannon were always cast complete with a bore but, for various reasons, did not always align with the outside of the cannon making it impossible to aim. Also, the inner surface was rough causing an imprecise diameter, occasionally leading to cannon balls jamming and the cannon exploding with fatal results [to the wrong side].

To make cannon more accurate and less likely to jam a boring process was developed, Fig.5. Only one cannon boring bar has been found in the Weald, from which this Fig.4 has been developed, although several boring sites are known, usually associated with a cannon casting blast furnace.

Many difficulties arise during boring, not least is the wear on the boring bits, this was partially overcome by using thin layers of steel (shims) which were welded together and hardened. Nevertheless, the sand and slag encountered in the as-cast cannon meant much sharpening and changing of the bits was necessary.

Another problem was setting-up the cannon on the trolley to be horizontally aligned with the boring bar and keeping it so as the cannon was pushed, on a trolley, against the boring bar. Undoubtedly, the boring tool seized-up in the cannon when in a hurry; fortunately, there was limited torque developed by the water-wheel and the seizure was released by pulling the trolley backwards.

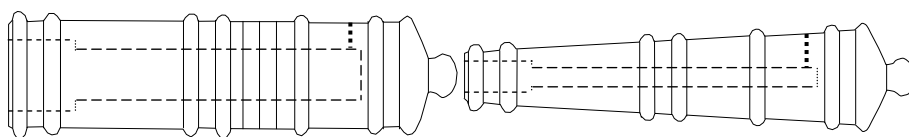
Because the boring bar is loosely coupled to the water-wheel it would not follow a straight course as it slowly tried to follow the slightly smaller bore of the as-cast cannon. This is the purpose of the “boring-bar steady”, Fig.5, but would require watching in case it moved.

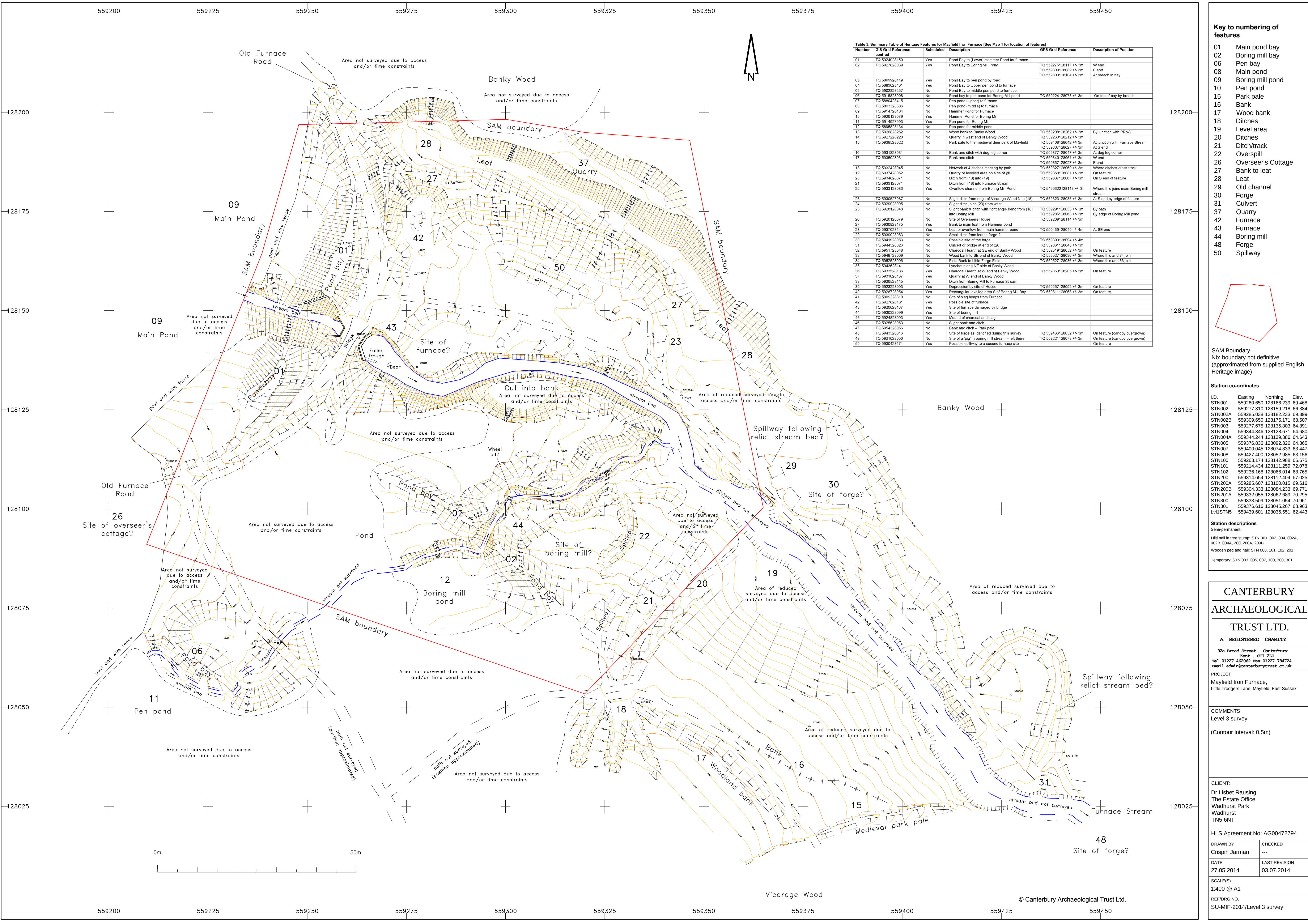
There is no evidence as to how the trolley was moved forward, nor how difficult this task was. It might have been possible to shove the trolley by leaning on it; maybe a “block and tackle” was necessary to give the required mechanical advantage but would have been complicated to arrange.

The water-wheel shaft relied on two bearing for horizontal alignment but it was also necessary to have a thrust bearing, Fig.5.

Now-a-days it is usual for a coolant to be used when cutting metals, perhaps water was used for cooling the cutting bits, which, if they got too hot the steel would lose their hardness.

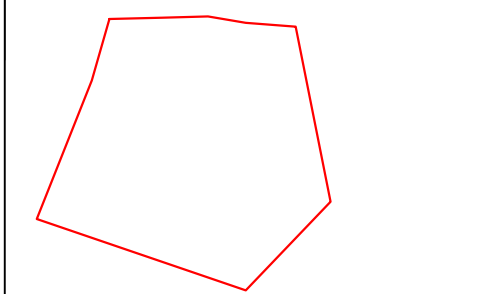
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Key to numbering of features

- 01 Main pond bay
- 02 Boring mill bay
- 06 Pen bay
- 08 Main pond
- 09 Boring mill pond
- 10 Pen pond
- 15 Park pale
- 16 Bank
- 17 Wood bank
- 18 Ditches
- 19 Level area
- 20 Ditches
- 21 Ditch/track
- 22 Overspill
- 26 Overseer's Cottage
- 27 Bank to leat
- 28 Leat
- 29 Old channel
- 30 Forge
- 31 Culvert
- 37 Quarry
- 42 Furnace
- 43 Furnace
- 44 Boring mill
- 48 Forge
- 50 Spillway



SAM Boundary
Nb: boundary not definitive
(approximated from supplied English Heritage image)

Station co-ordinates

I.D.	Easting	Northing	Elev.
STN001	559260.650	128166.239	69.468
STN002	559277.310	128159.218	66.384
STN002A	559285.038	128182.233	69.399
STN002B	559309.650	128175.171	68.507
STN003	559277.675	128135.803	64.891
STN004	559344.346	128128.671	64.680
STN004A	559344.244	128129.386	64.643
STN005	559376.836	128092.326	64.365
STN007	559400.045	128074.833	63.447
STN008	559427.400	128052.905	63.156
STN100	559263.174	128142.988	66.675
STN101	559214.434	128111.259	72.078
STN102	559236.168	128066.014	68.765
STN200	559314.654	128112.404	67.025
STN200A	559295.607	128100.015	69.616
STN200B	559304.333	128084.233	69.771
STN201A	559332.055	128062.689	70.295
STN300	559333.509	128051.054	70.961
STN301	559376.616	128045.267	68.963
LV15TN5	559439.601	128036.551	62.443

Station descriptions

Semi-permanent:
Hilti nail in tree stump: STN 001, 002, 004, 002A, 002B, 004A, 200, 200A, 200B
Wooden peg and nail: STN 008, 101, 102, 201
Temporary: STN 003, 005, 007, 100, 300, 301

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PROJECT
Mayfield Iron Furnace,
Little Troggers Lane, Mayfield, East Sussex

COMMENTS

Level 3 survey
(Contour interval: 0.5m)

CLIENT:
Dr Lisbet Rausing
The Estate Office
Wadhurst Park
Wadhurst
TN5 6NT

HLS Agreement No: AG00472794

DRAWN BY
Crispin Jarman

CHECKED

DATE
27.05.2014

LAST REVISION
03.07.2014

SCALE(S)
1:400 @ A1

REF/DRG NO.
SU-MIF-2014/Level 3 survey