

The Battle of Scheveningen 1653; Jan Abrahamz Beerstraaten (Rijksmuseum, Amsterdam)

Field Notes

Steel blooms from Brokes Wood Middle Iron Age bloomery Alan F. Davies John Colepeper de Lynleghe and medieval iron in Withyham

Geraldine CrawshawGeorge Browne: Gunfounder to the CommonwealthRuth Rhynas BrownSome probate inventories mentioning ironworksJ. S. Hodgkinson

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FIELD NOTES

Bardown Romano-British ironworking site, Ticehurst, East Sussex

Following a request by WIRG the site of Roman ironworking at Bardown Oak Farm, Bardown Road, Stonegate (TQ 6628 2930) has been granted Scheduled Monument status; list no. 1473350.

Bloomery slag in Tunbridge Wells, Kent

A small scatter of bloomery slag, including a possible hearth bottom and one vesicular fragment, has been found in a tree throw at approx. TQ 5784 4014 in Great Culverden Park, an area of private woodland. Further investigation is on-going. The geology is Lower Tunbridge Wells Sand with potentially ore-bearing Grinstead Clay outcropping 300m to the E and 400m to the NW.

A bloomery furnace in Framfield, East Sussex

Remains of a bloomery smelting furnace have been found during archaeological work in advance of residential building development south of Framfield Road, Blackboys (TQ 5179 2054). All that remained of the furnace was a depression in the ground of grey burnt subsoil filled with pieces of slag, burnt stone and furnace lining; some of the last was found *in situ*. The site is adjacent to a small group of formerly inhabited enclosures/structures dated by pottery finds to the Late-Iron Age/early Romano-British period. No slag heap has survived but pieces of slag have been found widespread as fill in several of the other excavated features. The site lies on the Ashdown Beds.

We are grateful to Chris Butler Archaeological Services and to Wessex Archaeology for information about the site.

Two bloomery slag scatters in Wadhurst, East Sussex

Scatters of bloomery slag have been discovered at two sites on Frankham Farm, where several other bloomeries and slag scatters have previously been found. The locations are at TQ 5957 3219 and TQ 6000 3203. Both are in or beside streams and both lie on the Ashdown Beds but adjacent to the base of the Wadhurst Clay. Our thanks to Joe Gingell for their locations.

STEEL BLOOMS FROM BROKES WOOD MIDDLE IRON AGE SITE, SOUTHBOROUGH, KENT

Alan F. Davies

Introduction

In 2014 WKD Archaeology began an archaeological excavation of a bloomery site at Brokes Wood (TQ 5905 4229). Carbon dating of site charcoal confirms smelting activities that date from 340 ± 30 years BC and places smelting well within the Middle Iron Age. Site evidence confirms prior Neolithic activities but with no indications either of medieval or post-medieval activity to detract from the significance of finds. The site is considered as one of the earliest recorded places for bloomery smelting in Britain.

Several WIRG members have already had some involvement in these investigations. This includes analyses of site samples of ores, a slag and sandstones in August 2016 (Davies, 2016). A progress report of overall activities, progress and findings was circulated by WKD Archaeology in 2019 (Stapple, 2019).

To meet the excavator's aims for a further evidential assessment of smelting finds and activities, a metallurgical and slags analyses report was issued in September 2022. This article presents a slightly abridged version of the report making these finding and conclusions available to a wider audience.

Specimens Provided

This study examines specimens of two blooms and an iron fragment provided by WKD Archaeology from a number of similar finds and comprise (Figure 1):

• Two partly compacted and fairly smooth surfaced iron blooms (items 1 & 2) of high heft, roughly of the same dimensions and weight. Bloom 1 has a slightly more botryoidal surface with contouring depressions. Bloom 2 is broadly similar but with a slightly more concave underside;

• The third smaller piece, Iron Fragment 3, is a more compacted bent slagged proto-bar iron with some processing forming a partial wedge-shaped section.

All were received with a prior coating of a 'clear varnish' for surface protection, giving each a slightly darker surface sheen.



Figure 1 – Brokes Wood Iron Specimens Provided

Scope Of the Analyses

Owing to possible slag degradation over a long time, the initial scoping decision is to focus on metal content and properties of specimens. However, during sampling small pieces of bloom slag became available from Bloom 1 and Iron Section 3, respectively, and are included in the study.

Findings

Preliminary

The underlying surface for all three specimens shows a mix of orange, brown and black progressive grades of surface oxidation as limonites (hydrated iron oxides), plus some porosity in the surface body of the bloom irons. Metallurgical examination reveals a common pattern of deeper original furnace slag with variable proportions of networked iron. Towards the surface the slag degrades to form a variable thickness orange/brown limonites 'rind'. Table 1 records information provided for specimen weights and site location with typical surface oxide depths.

Specimen	Given Site Source Location	Specimen Weight gms	Approximate Depth of Surface Oxides mm
Bloom 1	TQ 59052 42321	567	1.5mm – 2.00
Bloom 2	TQ 59052 42321	559	0.50mm – 1.00
Iron Fragment 3	TQ 55878 42312	169	0.10mm – 0.50

Table 1 - Summary of Properties

Thicker oxide layering on Bloom 1 indicates longer exposure to weathering conditions compared with bloom 2 and suggests an extended period between smelts. In contrast, Iron Fragment 3, is highly compacted iron with some attached slag but mostly of a thinner limonite coating. Notably, adjacent to a dense iron end section, there is a distinctive 3cm wide and fairly smooth concave depression ending in a very thin edged wedge of now corroded metal. The two blooms have similar low weights and small sizes, especially in comparison with the hearth size reported and shown in the 2019 report (Stapple 2019) – "the base of the furnace seemed particularly large for such an early date". Table 2 records Munsell Colour codings and Descriptions (Munsell 2008) for crushed slag specimens. Again, this shows Bloom 1 to be more degraded than the other specimens.

Slag Specimen	Bloom 1	Bloom 2	Iron Section 3
Munsell Colour	2.5YR 3/2	10R 3/1	7.5R 4/1
Munsell Description	Dk. Reddish Brown	Dk. Reddish Grey	Dk. Reddish Grey

Table 2 – Slags Munsell	Colours and	Descriptions
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Metallographic Examination

Bloom 1



Figure 2: Left – Black Porosity, Slag and Ferrite Iron with Spheroidised Carbides -Unetched x400. Right – Aggregating Ferrite Iron with Slag and Porosity x100. Light Etching with Nital 2%

- The sample zones 2 show hot forging compaction of iron network in slag with a total iron of between about 44% to 57% of area. Even with this variability the overall iron content is between about 60% and 70% of the bloom weight;
- Spheroidised carbide found within ferrite shows, in the left image, the effects of multiple stages of reworking of the iron bloom into a more rounded shape. Cycles of repeated heating to below red heat with localised compaction causes break-up of structures into fine carbide granules within ferrite iron;
- The right-hand image shows a section with a dark grey slag inclusion and black porosity plus some ferrite iron with fine Neumann lines. The presence of Neumann lines is evidence of more forceful forming effort on ferritic bloom iron at low (cold) temperature for parts of the bloom. This effect is discussed more fully for the Iron Section 3 sample;
- The structure shows about 0.14% carbon content indicating a mild steel composition. To achieve this level of carbon content needs furnace carburising zone conditions of about 900°C with a partial pressure of carbon monoxide (pCO) of 0.8 (80%) in the furnace gases carbon monoxide/carbon dioxide mix.

Bloom 2



Figure 3: Left – Slag Iron Boundaries x100 unetched. Right – Ferrite with Grain Boundary Pearlite x100. Nital 2% etch

- Figure 3, Left image shows a grey slag intrusion, areas of black porosity and about 54% of near surface area as iron (representing on average about 68% of bloom weight). The unetched ferrite matrix shows an aligned structure of deformed pearlite in ferrite from 'cold' forging work;
- The Right image shows a fairly fast cooled zone of acicular and deformed ferrite grains, grain boundary fine pearlite and some porosity. Ferrite iron in this image is about 85% of area;
- Dispersed spheroidised carbide in distorted ferrite indicates re-working of iron and low temperature deformation;
- Carbon content of iron is about 0.18% and within the range for a low carbon steel. Furnace carburising conditions are about 900°C with pCO closer to 0.85.

Iron Section 3



Figure 4: Left – Distorted Pearlite & Ferrite showing Neumann Lines x100. Right – Pearlite and Ferrite with Neumann Lines and Slip Bands. x400. Both etched Nital 2%

- Figure 4, Left image shows a zone of 100% compaction of bloom iron into a small proto-bar section of distorted ferritic iron with fine pearlite zones. From specimen calculated specific gravity the overall specimen iron weight proportion is 85%;
- Especially noted are the many ferrite grains displaying parallel crossing Neumann slip lines within individual ferrite grain crystals. The righthand image, at higher magnification, shows many of these slip lines include thin 'twin' banded zones reaching to the now stepped edge of ferrite grains. This finding supports earlier site evidence of hammering adjacent cold iron to form a very thin iron wedge in this sample;
- This sample is a low carbon mild steel with 0.12%C content. This level of carbon content requires a furnace carburising zone closer to 1000°C with a furnace gases pCO of 0.9.

Shock induced deformation structures are a key indicator for steel being heavily and forcibly cold forged. The original site findings reference

That comparing surface contours of several iron blooms, found near the furnace site, as well as the remains of a smithing hammer, left little doubt that some of the blooms had indeed been 'processed' on the surviving stone fragment and strike marks on the blooms were consistent with the shape and size of the hammer.

Metallurgical Factors

Producing Steel

Evidence of higher proportions of structural pearlite in iron shows smelting achieves higher 'carbon potential' furnace gases to convert nucleated iron into low carbon steel blooms. Iron carbide present within localised pearlite structures makes a harder and stronger steel compared with very low carbon and more malleable bloomery iron. Higher carbon potential gases require the use of higher carbon density burden charcoal (sourced from hardwoods), the right mix of ore to charcoal, managing the rate of blowing the furnace to ensure the required temperature profile and importantly, experienced smelters.

Producing steel consistently over a long period implies an intention to produce a stronger, more useful and valuable product. Currently there is no site information about the likely furnace height compared with its relatively broad base. A low height, more 'squat', furnace can produce bloom iron. However, a taller furnace extends the burden/slag drop time and iron exposure to carburising conditions above the combustion zone to produce a 'steely' bloom.

Bloom Compaction

The previous report comments that 'interpretation of the site hammerscale evidence would suggest an area of hammering next to the bloomery furnace'. On extraction from a furnace the bloom temperature falls quickly during hot hammering compaction producing knocked-off slag+iron hammerscale.

Both blooms are similar in size and weight with high iron content and this may be the (chosen) limit for the compaction done on site. So, another feasible intermediate process would be to hot chisel quickly a larger extracted bloom into smaller and more manageable sections for easier shaping into smaller blooms.

Below red heat the bloom steel structure changes and becomes harder to deform. Re-heating a bloom to red heat in a small stone-lined, bellows-blown charcoal pit furnace, restores hot malleability for further working. Bloom 1 and to some extent Bloom 2, show effects from intermediate reheating cycles and hammering to low temperatures. Whilst the final bloom properties of the specimens can differ over small distances, they do show mostly final cold

re-worked structures of low carbon steel with some slag.

Work Hardening

Cold forging by hammering a steel section produces a work hardening effect of more resistance to ever more hammering deformation. This may even be an acceptable outcome for the intended use of the iron. However, very heavy hammering to make it stronger or stiffer can 'shock' the steel causing incipient fractures in thin sections, especially for any intended cutting edges.

Slags Analyses

Micrographs

In Figure 5 micrographs show an example of the structures for specimens 1 and 3 respectively. Both show very distorted minerals from effects of processing activities and weathering degradation making both less easy to assess visually.



Figure 5: Left - Bloom 1. x100. Right - Iron Section 3. x400. Unetched

Chemical Analyses

Chemical analyses of two slags, Table 3 and Figure 6, show a similarity in oxides mix and proportions.

	% Bloom 1	% Iron Section 3
Volatiles	2.44	3.31
Combined H ₂ O	12.89	10.30
SiO ₂	4.98	6.25
Fe ₂ O ₃	54.19	69.03
FeO	7.63	8.28
Al ₂ O ₃	16.67	0.85
CaO	0.23	0.23
MgO	0.00	0.00
N.D	0.98	1.74
Total % =	100.00	100.00
$Fe^{2+} =$	5.93	6.44
$Fe^{3+} =$	37.92	48.31
Total Iron % =	43.85	54.75
5000mPas Flow	1200°C	1236°C

Table 3: Specimen %Oxide Profiles

The mix of oxides provides a measure of slag viscosity as a factor influencing the ease of original bloom formation. Bloom 1 slag gives a fluid flow at 1200°C and is within a furnace upper operating temperature. Similarly, Iron Section 3 slag achieves a good flow at 1236°C.



Figure 6: Oxides% Profiles for 'Bloom 1' and 'Iron Section 3' Slags

The combined water from chemical weathering effects is marginally lower for the Iron Section 3 sample. However, both slags with high ferric oxide content and 10% - 13% combined water represent as mostly limonitic iron oxides.

The earlier reported site samples chemical analyses of 2016 show that the ores and local clay for furnace construction can contain alumina. These sources add to a variable alumina load in the furnace and likely underpin the higher level found, especially in Bloom 1 slag.

Phase Fields

The ternary Silica-Wüstite-Alumina phase diagrams in Figure 7 show, left, as a star, how the Bloom 1 higher alumina content in residual smelt slag takes the composition slightly away from an optimum fayalite smelting composition and into the spinel hercynite phase region. The effect is a higher viscosity slag but furnace temperature enables a well-formed bloom mass. Conversely, the high equivalent FeO content in slag on the Iron Section 3, right, and with only trace alumina, more likely represents a 'rusting' limonite of hydrated wüstite.



Figure 7: Ternary Phase Fields. Left. Bloom 1. Right. Iron Section 3

Mineral Analyses

A Normative Analysis of Bloom 1 oxides shows, Table 4 & Figure 8, the volume% proportions of minerals in the furnace slag at the end of smelting.

Mineral	Composition	% Bloom 1
Plagioclase	CaAl ₂ Si ₂ O ₈	1.84
Corundum	Al ₂ O ₃	18.39
Olivine	Fe ₂ SiO ₄	75.83
Magnetite	Fe ₃ O ₄	3.93
	Sum % =	99.99

Table 4: Normative Volume %Analysis for 'Bloom 1'



Figure 8: 'Bloom 1' Slag Minerals Volumes%

Olivine, as the dominant mineral and with no magnesia in the slag, represents residual eutectic fayalite slag after the reduction of excess wüstite to bloom iron. This shows an example of smelting management achieving a good bloom yield from Wealden ore.

Conclusions

Within the limits of the specimens available, these analyses provide added evidential site context for likely furnace operations, metallurgical conditions of bloom iron produced, post-smelt bloom forming processes and furnace slag mineralogy. In combination these provide themic indicators for the effectiveness of furnace management and operational capabilities to produce high quality blooms. As a summary these are:

Good Furnace Management

A well-established smelting capability to produce compacted blooms with easily 70% or more iron weight. A bloom slag analysis supports this capability for an efficient and integrated management of smelting activities using high quality Wealden ores, for:

- Effective furnace blowing and furnace temperature profiles for bloom formation;
- Achieving fluid fayalitic furnace slags;
- Producing furnace gases with a carburising potential for producing steel.

In combination these attest to considerable smelting experience, likely from early imported skills, with capabilities for steel bloom output consistency over a long time.

Producing Higher Value Steel

With effective operations, the key technical finding is that the site produced steel blooms of similar size/weights. Moreover, bloom iron carbon contents ranged over 0.12%C – 0.18%C and well within present-day commercial specification of 0.05%C – 0.25%C for a low carbon steel.

Steel metallurgical structures show residual cold deformation effects from initial and repeated hot bloom forging compaction. Hot forging continues through to lower temperature cold forging with final air cooling. Iron Section 3 shows a high compaction of iron and especially good steel malleability, from evidence of forceful cold hammer working to form a thin iron wedge section.

Producing carburised iron as steel over an extended time span could well suggest manufacturing intentions other than just by chance, to produce a stronger, more useful and higher added value steel, instead of very low carbon bloom iron.

Furnace Capacity and Bloom Sizes

A contradiction appears between the large internal base diameter of the furnace, able to smelt a large bloom, compared with specimen bloom samples where each is held easily in the palm of a hand. With no site information about furnace height it is, nevertheless, feasible for a tall furnace on the broader base to be operated to produce larger steel blooms. Then, on extraction, the large hot bloom is hammer chiselled into separate and more manageable sections. These are forged separately into more uniformly smaller blooms. A close-by re-heating, stone-lined charcoal 'pit furnace' would enable concurrent smaller bloom reheating and forging alongside furnace smelting activities.

An Opportunity for Trading

Within the overall context, it may well be speculative to consider whether the Brokes Wood site either was or became an early iron production and trading centre. For this it would supply part-processed high steel content bloom balls to smithies for secondary processing to steel bar and other end-use items. Typically, these can include steel for more wear resistant ploughshares, crop and timber cutting implements, sharper knives and shaping tools, weapons and fasteners of all types. In this way some more economic support would be available for its community.

Bibliography

Munsell, (2008) - ASTM, Standard D 1535-08, *Standard Practice for Specifying Color by the Munsell System*, approved January 1, 2008.

Davies, A., 2016, 'Analyses of Brokes Wood Iron Age Furnace Site Samples', August 2016.

Stapple, N., 2019, 'A Middle Iron Age Bloomery Furnace Cut into A Prehistoric Earthwork in West Kent', WKD Archaeology.

These two reports (Davies 2016 and Stapple 2019) are available on the Wealden Iron Research Group Database: www.wirgdata.org/searchsites2.cgi?siteid=924 (accessed 1 May 2023).

JOHN COLEPEPER DE LYNLEGHE AND MEDIEVAL IRON IN WITHYHAM, EAST SUSSEX

Geraldine Crawshaw

Documents which record medieval iron working in the Weald are rare. An early fourteenth century iron concern in the parish of Withyham, East Sussex, was noted by Cleere and Crossley when considering the form and chronology of the medieval industry:

Another landowner whose estate contained ironworks was John de Lynleghe ... there is a reference to his lands at Withyham, his forge and its stock, although there are no details of how it operated.¹

Cleere and Crossley refer to the document, PRO SC 6/1146/2, now in the National Archives. It is part of a bundle of ministers accounts, and membranes 2 and 3 have recently been translated for WIRG from the Latin by Anne Drewery and Christopher Whittick. Paragraphs 3, 7, 8, 11 and 12 are given below:

SC 6/1146/2 membrane 2 [Paragraph 3]

Sussex

Also the account of Richard de Potesgrave for the issues of the lands and tenements in Withyham and the goods and chattels belonged to John de Lynleghe at Hartfield in the County of Sussex from the sixth day of January in the fifteenth year of the reign of King Edward [II] until the feast of St Michael next following in the sixteenth year [6 Jan - 29 Sep 1322] on which day the tenements which belonged to the said John in Withyham together with the tenements which belonged to

^{1.} H. F. Cleere and D. W. Crossley, *The Iron Industry of the Weald* (Cardiff, Merton Priory Press, 1995), 92.

William de Kocshete there were leased to farm to William Dallingridge by writ of the King

Withyham and Hartfield valued (extenditur) at 6s 2d

[Paragraph 7]

[marginated] *dead stock*

He answers for 21s 8d from the mine of iron (de mina ferri), *from rocks* (petris) *and from certain tools for making iron: belkes* [possibly bellows] *and tenances* [possibly tongs] *found there, sold with a certain site* (placea) *had for digging rocks to make iron from, leased until the feast of All Saints in the seventeenth year* [1 Nov 1323] *of King Edward. And he answers for 53s 4d for wood bought by John de Lelleie from the Prior of Tandridge in Hartfield, sold thus. And for 2s from a certain table belonging to the said John, sold. Sum 77s*

Sum of Receipts 112s 3d

[marginated] rents resolute as contained in the extent Paid to the Manor of Buckhurst, which is in the hands of the Queen of England, for annual rent, 4s. Also to William Waleys for part of the said tenement held of him, 11d

Sum 4s 11d

[Paragraph 8] [marginated] wages He accounts for the wages of a servant living there to guard the wood and repair the forge (fabricam) where iron ought to be made, for ten weeks, taking each week, 10¹/₂d

> Sum 8s 9d Sum of Expenses 13s 8d And he owes £4 18s 7d

[marginated] Lynleghe

Sussex

[Paragraph 11]

[marginated] *dead stock*

He answers for mine for making iron found there worth 6s 8d. Also certain tools namely belkes tenaces of iron for making iron worth 5s. Also dug stone and a site for digging stone worth 10s. Also wood

bought by the same John from the Prior of Tandridge worth 4 marks. Also for a table worth 2s

[membrane 3] [paragraph 12]

Kent Lynleghe

Item the account of Richard de Potesgrave for the issues of the lands and tenements which belonged to John de Lynleghe, namely the son of Thomas Colepeper, in the County of Kent in Tudeley and Capel from the sixth day of January in the fifteenth year of the reign of Edward until the feast of St Michael in the sixteenth year [6 Jan - 29 Sep 1322] on which day the said tenements were leased to farm to John Alfrey by writ of the King

This record has survived because it concerned land and goods that were taken into the hands of the King, Edward II, in 1322. The forfeited land included an area where ore was being mined and a location where iron was produced, along with certain tools.

Other seizures are recorded in membrane 2, but not quoted here, which include the goods and chattels of Nicholas Colepeper, then Rector of Cowden in Kent, and stock, crops and other issues of the lands of John de Lynleghe amounting to 35s 3d.² Membrane 3 has a description of the sale of corn (from 6 acres) and rent from 14 acres with a tenement belonging to Lynleghe in Tudeley and Capel.

This paper looks at who John de Lynleghe was, why lands and goods were seized by Edward II during the brief period of civil war from 1320 to 1322 and why John de Lynleghe forfeited his lands. A suggestion for the location of his iron works is put forward.

John de Lynleghe

His full title, John Colepeper de Lynleghe, is recorded in a fine in 1338-1339:

William Bachiler, clerk (by John de Wygeton) v, John Colpeper de Lynleghe and Joan his wife; 30 acres land in Withyham: to Wm for 20

^{2.} E. Ewing, Cowden, the records of a Wealden parish (Tunbridge Wells, 1926).

marks³

He was born around 1262.⁴ John, Nicholas, Walter and Thomas were all sons of Sir Thomas Colepeper of Brenchley, Kent, mentioned in the first paragraph of membrane 3, who lived from c.1244 to 1309.⁵ The Colepeper family owned land in Pembury, Foulsden, Tonbridge and Tudeley. They acquired land in Sussex between 1314 and 1320 in Buxted, Frant and Maresfield.

Edward II and the Despensers

Dissatisfaction with the rule of Edward II (1307-1327) led to many of the peers and clergy of England attempting to impose fiscal reforms upon the king. These 'ordinances' being forced upon Edward and his household were in large part an attempt to limit the powers of the king's latest 'favourites'. From 1319 to 1322 Edward allowed his new favourite, Hugh Despenser the younger, to practically rule the country with him. Despenser's greed for land and his ruthless ambition caused enormous political instability which would eventually lead to the tragic downfall of the king.

By 1321 many barons and their followers had become involved in a civil war against the king and the Despensers, father and son. The aristocrats were led by Thomas, Earl of Lancaster (a cousin of the king) and several of the lords from lands in the Marches. The king named his opponents the 'contrariants'.

The war escalated after the siege of Leeds Castle in Kent at the end of October 1321, when the king, as an example to others, executed 13 members of the castle guards. This included the leader of the garrison, Walter Colepeper, brother of John, hanged for supporting his contrariant overlord, Bartholomew Badlesmere. This action, even in the early fourteenth century was shocking to many. News reached Tonbridge where Walter's brother,

^{3.} L. F. Salzmann (ed.), *Sussex Feet of Fines 1308-1509* (Lewes, Sussex Record Society, **23**, 1916), no. 1870, 12 Edward III [1339]

^{4.} https://www.geni.com/people/John-Culpeper-of-Lynleigh/6000000014903390402, Date accessed 22 Apr 2023 ; L. F. Salzmann (ed.), *Sussex Feet of Fines 1249-1307* Lewes, Sussex Record Society, 7, 1908), no. 909.

^{5.} F. W. T. Attree and J. H. L. Booker, 'The Sussex Colepepers', *Sussex Archaeological Collections*, **47** (1904), 49-50; E. Hasted, *The History and Topographical Survey of the County of Kent, vol 5* (Canterbury, W. Bristow, 1798), 284.

Thomas, was holding the castle for the contrariants. He escaped but was later captured and publicly hanged in Winchelsea where he had been Governor.

Edward was joined by the Despensers by the 3rd March 1322 (after their brief period of exile) and on the 16th the Royal army met the contrariant army at Boroughbridge, in Yorkshire, where the road to the north crosses the river Ure. The king's army, under Andrew Harclay, sheriff of Cumberland, captured and killed many of Lancaster's army. Earl Thomas himself was imprisoned and later executed. Many contrariants deserted or surrendered.

John Colepeper was probably with the contrariants at the Battle of Boroughbridge in March 1322, although he may have been quite an elderly man by then. He was taken as a prisoner to York Castle in July 1322.⁶ He must have been transferred to Berkhampstead Castle, Hertfordshire, and then in 1325 to Gloucester Castle.⁷ Perhaps he was regarded as one of the rebels who might endanger the king and the Despensers if allowed to purchase his freedom. Prisoners were moved from castle to castle to prevent rescue attempts and escape.

Within six months the rebellion was over. Through amassing the lands and goods of the contrariants or fining them heavily to retrieve their land, Edward II more than doubled his income from his demesne lands each year. From then until the end of his reign he was a rich but very much despised king.⁸

6. *Calendar of Close Rolls* (hereafter *CCR*), *Edward II vol 3*, *1318-1323* (London, 1815), 580, "The following to receive the following prisoners... 'The sheriff of York to receive John Hausard, Tho de Berkele, Maurice de Berkele... [et al] and John Colpeper to be kept in York Castle".

7. *CCR, Edward II: vol 4, 1323-1327,* m.23, p.424; Nov 10 [1325] Cippenham, "To John de Enefeld, William de Weston, and Otelinus Alemaund, the king's serjeants-at-arms. Order to conduct ... John Colepeper and Adam de Way, who are likewise imprisoned in Berkhampsted castle, to Gloucester castle, and ...cause them to be kept safely in the said castle until otherwise ordered".

8. The history of the contrariant rebellion can be found detailed in: N. Fryde, *The tyranny and fall of Edward II 1321-1326* (Cambridge University Press, 1979); R. M. Haines, *King Edward II* (McGill-Queen's University Press, 2003); K. Warner, *Edward II The unconventional King* (Amberley Publishing, 2014); Kathryn Warner, http://edwardthesecond.blogspot.com, Date accessed 22 Apr 2023.

The Forfeited Lands

The document was prepared by Richard de Potesgrave, one of the clerks tasked with recording and evaluating certain lands and goods of contrariants seized by the king. He was in fact Edward II's chaplain and confessor⁹ and described as the keeper of certain rebels' lands in Kent in 1322, in particular those of Thomas Colepeper.¹⁰

Nicholas Colepeper, mentioned earlier, the brother of John, Walter and Thomas, was imprisoned as a contrariant in Rochester Castle.¹¹ Another contrariant recorded here, whose lands were forfeited was William de Kocshete or Cockshut. He was also imprisoned in Rochester Castle and forced to give up lands and tenements in Withyham.¹² The Kocshete/ Cochshot/Cockshut family lands, by the late sixteenth century, formed a large parcel between Withyham village and the river Medway to the north, by then part of the Barony of Buckhurst.¹³

From an entry in the Close Rolls Nicholas would appear to have been given a chance to buy his freedom.¹⁴ No such offer was made to his brother John after he was imprisoned as a contrariant.

The forfeited lands of John Colepeper and William de Kocshete in Withyham were leased to William Dallingridge. He and his brother John were living in Hartfield at the turn of the fourteenth century. They had been appointed as Foresters of Ashdown Chase.¹⁵ John was later to acquire all the lands of Bolebrook manor in the Medway valley when he married Joan, the heiress of Sir Walter de la Lynde.¹⁶ The Buckhurst Terrier, made for Sir Thomas Sackville in 1587, shows several parcels of Dallingridge land in the Medway valley less than 1km west of the Cockshut lands.¹⁷

- 9. CCR, Edward II, vol 2, 1313-1318 (London, 1893), 313.
- 10. CCR, Edward II, vol 3, 1318-1323 (London, 1895), 475, 641.
- 11. CCR, Edward II, vol 4, 1323-1327 (London, 1898) 1324 Mar 30 Westminster, m.14.
- 12. op. cit.

13. E. Straker (ed.), *The Buckhurst Terrier 1597-1598* (Lewes, Sussex Record Society, **39**, 1933), 3, 10, 12, 13, 35, maps XXVII, XIII.

- 14. CCR, Edward II, vol 4, Westminster 30 Mar 1324, m.14.
- 15. The National Archives, SC 8/36/1783.
- 16. M. A. Lower, Bodiam and its lords (London, John Russell Smith, 1871).
- 17. Straker, The Buckhurst Terrier, maps XII, XIII, XVIII.

John Colepeper would be a free man again from 1327, on the accession of Edward III, though we have no record of his ironworks being restored to him.¹⁸

He is listed as paying 1s 6d in the lay subsidy of 1332 in the *villat* (a borough or tithing) of Birchden within the Hundred of Hartfield, so must have lived or owned property there at that time. In the fourteenth century Birchden was a large *villat* containing most of the land in Withyham parish. By the time of the Duchy of Lancaster survey of *villat* bounds in the Hundred of Hartfield in 1579, the south eastern part of Withyham parish had become a new separate *villat*, that of Lyhode (Lyewood).¹⁹ The only villats listed in the 1296, 1327 and 1332 records of subsidies are Blackham, Birchden, Folkenhurst and Parock.²⁰

One of the jurors recording the 1296 subsidies was a Johanne Fabian (a reference to iron?), paying 10s. This was the highest amount paid among the 12 jurors by far, a rich member of the community. He could have been living in any of the four *villats* – perhaps he was John, the owner of the ironworks.

We have seen that in the Fine of 1338-9 John Colepeper and his wife Joan were selling 30 acres of land in Withyham. Where was the 'certain site had for digging rock to make iron from'?

The ironworks of John Colepeper were listed as 'mine for making iron' (ore ready for roasting?), 'dug stone and a site for digging stone' (minepits or a quarry) and 'certain tools for making iron' (possibly bellows and tongs - the words *belkes* and *tenaces* do not appear in other documents for medieval ironworks such as Tudeley or Byrkeknott/Kyrkeknott).

A John de Leleie, presumably John de Lynleghe, is recorded as buying wood in Hartfield from the Prior of Tandridge. This priory was founded 1200-1218 in Surrey. Rent was due to the priory from a property 'in Hertfyld' in 1408, presumably an early grant of land.²¹ The wood bought was a large amount

18. CCR, Edward III vol 1, 1327-1333 (London, 1898), 1327 p.20, m.19.

19. East Sussex Record Office, ASH 1171 A; my thanks to Christopher Whittick for this reference.

20. W. Hudson (ed.), *The three earliest subsidies for the County of Sussex* (Lewes, Sussex Record Society, **10**, 1910), 31.

21. A. Heales, The History of Tandridge Priory, Surrey (London, Roworth, 1885), 37-38.

judging by its value (53s 4d) and no doubt was for converting to charcoal for the bloomery smelting process and perhaps for buildings. A servant was employed to 'guard the wood and repair the forge where iron ought to be made'. This may have been a timber-framed building with a smelting furnace at one end. Fourteenth century examples of such buildings have been found at Minepit Wood in Rotherfield, about 3km from Withyham church, and also at Llwyn Du in Coed y Brenin, in North Wales.²²

Digging ore and smelting would have been carried out in close proximity in medieval times, as at Tudeley and at Minepit Wood, Rotherfield. The document specifies Withyham as the location of John Colepeper's tenements and land, other goods and chattels coming from Hartfield.

The Location of the Ironworks

The Hundred of Hartfield became the parishes of Hartfield and Withyham for the most part. Withyham is a large parish, now around 8125 acres (Fig. 1).²³

Several ironworking sites are listed on the WIRG database (Fig. 2):

22 bloomeries, only 2 of which have evidence of the Romano-British period 1 medieval bloomery at Summersales

- 2 post-medieval forges
- 1 post-medieval blast furnace

The case will be put forward here for John Colepeper's ironworking site being close to the village of Withyham, which in the fourteenth century was a scattering of farms and dwellings focusing on the church, presided over by the important manor of Buckhurst and its two deer parks. No fieldwork has yet taken place and evidence may have been destroyed in subsequent

22. J. H. Money, 'Medieval iron workings in Minepit Wood, Rotherfield, Sussex', *Medieval Archaeology*, **15** (1971), 86-111; Llwyn Du, medieval bloomery site (NPRN: 209191. Discovery of a smelting furnace enclosed within a timber framed building of 14th century date, https://coflein.gov.uk/en/site/309191?advanced[0][name.value]=llwyn%20du&pg=3, Date accessed 22 Apr 2023; P. Crew and T. Mighall, 'The fuel supply and management of a 14th century bloomery in Snowdonia: a multi-disciplinary approach', from J. Humphris and T. Rehren, *The World of Iron, Proc. of a Conference at the Natural History Museum*, (London, Archetype, 2009), 473.

23. Ordnance Survey, 6in. map 1873.



Figure 1: The extent of Withyham parish



Figure 2: Ironworking sites in Withyham parish



Figure 3: Geology of Withyham village

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Figure 4: Lidar map of Withyham village

landscaping.

Firstly the geological map of Withyham village shows a small lens of ironbearing Wadhurst Clay straddling the high road (Fig. 3)

There are pits visible in the landscape which may have been made by iron mining, clay extraction for marling or building material and quite possibly for all of these. On the Wadhurst Clay a large pit, now filled with water, is seen to the north of the road in woodland (TQ 4968 3588). There are traces of trackways leading east and south from the southern end of the pit. On the south side of the road, in the grounds of the old house, Duckings, is another large pit in the Wadhurst Clay, which is now an ornamental lake (TQ 4986 3573).

The lidar in Fig. 4 shows these big pits clearly with former pits/quarries around the area of Duckings lake. The adjoining area to the west, between Duckings and the Ockly Gill shows signs of many small pits (TQ 4978 3570).

It has been noted above that John Colepeper bought wood from the Prior



Figure 5: Part of the Manor of Buckhurst in 1597, adapted from the Buckhurst Terrier.

of Tandridge. From 1521 "the lease of the manor of Sentie in the parish of Hertfilde, Sussex to John Hayward for 16 years at £4 rent" is the first clue as to where the priory's lands lay.²⁴ Sentie is now known as St Ives Farm, on the northern side of the Medway about 3km west of Withyham village (see Fig. 2). If John Colepeper's iron site was close to Withyham village, the transportation of wood from 'Sentie' would be quite convenient. Some of his farm stock, goods and chattels were taken from Hartfield so he may have had a farming interest in land adjoining Withyham village.

As the tenements which had belonged to John in Withyham and those of Kocshete were leased to farm to William Dallingridge, the likelihood is that the forfeited lands would be near to other land belonging to the Dallingridge family such as that in the Medway valley north of the village (Fig. 5).

The land sold by John Colepeper and his wife in 1339 was to a clerk, William Bachiler, who was the Rector of Withyham church in 1328 and would have lived in the adjoining rectory.²⁵ Land just east of the rectory adjoining the Ockly Gill was later known as 'Batchelers Field and Mead.²⁶ Could this have been purchased from Colepeper by Bachiler the rector?

By 1597 the lord of Buckhurst manor recorded that he

*haith and time out of mind haith used to have on ffaire which is yearly kept on the ffeast Daie of St Michael the Arcangell within a piece of land called Batchelors field, parcel of the tenement called Somers.*²⁷

Somers Farm was on the site of the present Dorset Arms Inn. Fairs are no longer held and the Fairfield/Bachelors has become a recreation ground.²⁸

Iron working was re-established in Withyham before 1574, with a forge built just south of the village (TQ 5000 3530) run by ironmaster John Baker of Duckings. He also ran the furnace at Crowborough Warren then.²⁹ The Duckings tenement was leased by Thomas Sackville, Lord Buckhurst, to John Baldwine in 1597, but he did not include

24. Heales, Tandridge Priory, 45.

25. C. N. Sutton, *Historical notes of Withyham*, *Hartfield and Ashdown Forest* (Tunbridge Wells, Baldwin, 1902), 24.

26. Straker, Buckhurst Terrier, 10, map XIV (see also Fig. 5).

- 27. Sutton, *Historical notes*, 18.
- 28. Hartfield Times, Issue 1 (1995), in Barbican House Library, Lewes.
- 29. www.wirgdata.org/searchpro2.cgi?personid=1274, accessed 20 Apr 2023.

all the underwoods and trees, all myne and mynes and quarries of stone with free ingres, egres and regres at all reasonable and convenient times of the year, as well for the cuttinge down cordinge and coalinge and carrienge away of the said woods underwoods and trees as also the digginge, drawinge and carrienge away of the said myne and stone.³⁰

A provision such as this was not added to all Sackville properties, so he must have been aware of the Duckings land's potential for iron production and wished to retain valuable mining rights for himself. There may have been evidence of iron working there as a result of post-medieval production or perhaps remnants in the landscape still visible from three hundred years before.

Another clue that Colepeper's ironworks were near Withyham village is that he paid rent to the manor of Buckhurst, at that date not as extensive as it was to become. That the manor appears in the "hands of the Queen of England" (Queen Isabella was tenant in chief at that time) is because the lord of Buckhurst, Andrew Sackville III, was still a minor in 1322.³¹

The iron-bearing rocks, the pits, the proximity of Dallingridge, Cockshutt and Buckhurst land, with the short journey for wood fuel all suggest John Colepeper's iron works were near to Withyham village rather than in the north or south of the parish. Lands which later became the tenements of Somers or Duckings seem feasible.

The Tudeley Connection

Membrane 3 of the document describes issues of lands and tenements forfeited by John Colepeper in Tudeley and Capel, Kent. Colepepers were involved in ironworking in Tudeley on the Southfrith estate owned by Elizabeth de Burgh, Lady of Clare. The first surviving accounts of iron production there date from 1329-1330. A Walter Colepeper is mentioned in the accounts of 1350-1352. In 1354 Richard Colpeper was named in a contract to supply ore to the keeper of the works, Thomas Springet.³² Later

^{30.} Straker, Buckhurst Terrier, 8.

^{31.} A. Collins, The Peerage of England vol 2 (London, Strahan and Rivington, 1768), 267.

^{32.} J. S. Hodgkinson and C. H. C. Whittick, 'The Tudeley ironworks accounts', *Wealden Iron*, 2nd ser., **18** (1998), 37.

in 1354 Elizabeth de Burgh made a lease for three years to run the Tudeley ironworks to Richard Colepeper and another lease in 1357.³³ The accounts mention Richard again in 1362, the year of the 'Second Pestilence' (Black Death).³⁴ In a fine of 1321 Thomas Colepeper and his wife Margery recorded their sons, Walter, John and Richard.³⁵ Walter and Richard Colepeper may have learnt their ironworking skills from their uncle John Colepeper de Lynleghe.

From the sixteenth century the Colepeper family interests in iron were evident in many parts of Kent, in Goudhurst, Tonbridge and Hawkhurst, as well as Tinsley and Robertsbridge in Sussex.

^{33.} op. cit., 38

^{34.} M. S. Giuseppi, 'Some Fourteenth-Century Accounts of Ironworks at Tudeley, Kent', *Archaeologia*, **64** (1913), 151.

^{35.} J. Greenstreet, 'Kent Fines, 10-15 Edward II', Archaeologia Cantiana, 14 (1882), 276.

GEORGE BROWNE PART I: GUNFOUNDER TO THE COMMONWEALTH

Ruth Rhynas Brown

Introduction

George Browne was the third of the Browne family to eventually bear the title of Royal gunfounder. He was born in 1627 and christened in September at Brenchley church in Kent, the fourth and last of John and Martha Browne's children (Edwards, 138). His grandfather Thomas and his father John had been royal gunfounders since the days of Queen Elizabeth. John Browne was the most enterprising of the family; he had taken advantage of the Stuart policy of restricting the export of guns to possible enemies to establish a near monopoly in supplying cast-iron ordnance. When one of London's two bronze gun foundries closed in the 1630s, John Browne - never one to pass up on a business opportunity - persuaded the government to lend him the money to turn one of his ironworks into a facility capable of casting bronze guns. When George was 11 years old, King Charles I stopped at the works during a visit to Kent to see a bronze piece being cast; the gun is still on display in the Tower of London (Blackmore 1976, 64). By the time of his death in 1651, John Browne and his partners were the most important suppliers of ordnance to both the state and civilian markets in the country (Brown 2004; 2005; 2006; 2008).

George Browne had probably not been expected to be a major part of this business. His eldest brother, John II, had been trained up as his father's deputy, based near the ironworks in the Weald, while his father spent much of his time in London, lodging near the Tower of London, home of the Office of Ordnance, one of their biggest clients, and Tower Hill, where the civilian gun market was based. However, John II died unexpectedly in 1647 at the early age of 26, leaving a widow and two small children. In December 1647 George Browne married Anne Dobell, one of Walter Dobell's daughters from Streat in the south of Sussex. Although the material gains of the marriage were relatively modest, the bride came with a host of kinsmen and connections who worked in the iron industry and would be useful contacts in years to come (Brown 2008, 24). At 20 years old, now a married man, George probably had to now take more responsibility in the ironworks; certainly his son George Browne II was christened at Horsmonden church in 1649.

A few months later there was a second important marriage in the family when Susan, John II's widow, married a Horsmonden neighbour and local ironmaster, Alexander Courthope. This union would have important repercussions for the family; John Browne III, the last of the gunfounding Brownes would be brought up in Courthope's family home as his stepson, while Courthope himself would be an important partner in various Browne enterprises in years to come.¹

Two deaths, in quick succession, changed the course of George's life. First his wife Anne died at Horsmonden in 1650, leaving him with a young child, George Browne II. Then, a few months later in 1651, John Browne senior died. In his will, the two largest bequests were to George and his brother-in-law Thomas Foley, who together now took over the business. Thomas had married Anne, George's sister, in 1638 and they already had a number of children. He was a member of the Foley ironmaster family of the Midlands and in the 1640s had already been entrusted by Parliament to run the gunfounding business when the Brownes had been under suspicion of aiding a Royalist uprising (Brown 2006 45-7). George's surviving elder brother Thomas had converted to Catholicism while studying medicine abroad and had been excluded from his father's will.²

New Beginnings

We can deduce how the new partnership worked in the early years of its existence. The Brownes occupied the ironworks between the villages of Horsmonden and Brenchley, and Spelmonden their home, and at Barden located further away near Tonbridge. The former was the furnace which been bought by the elder John Browne in 1625 after the family had leased it

2. The National Archives (hereafter TNA), PROB 11/217/122.

^{1.} East Sussex Record Office (hereafter ESRO), SAS-CO/1/48/711.

for many years.³ A new facility for casting brass guns had been built there. They had a further facility at Snodland where the guns were finished, reamed and proofed and a wharf at Millhall on the Medway where the iron guns and other merchandize could be loaded onto river transport. In addition they had a warehouse in London close to the gun markets at Tower Hill. Beside this they could lease other works for shorter times as needed.

George Browne and Foley depended on the team of workmen built up by John Browne senior, men experienced in iron and bronze founding with the necessary skills for casting guns and planning a practical campaign using their different sites: moulders, founders, clerks, foundry-men, labourers. In 1619 Browne had claimed to employ two hundred men at his works in the Weald and in his will, John Browne remembered some of these workmen, such as Thomas Hawkins, Thomas Dawson and Henry Quintin and his family (Brown 2005, 39).⁴

George appears to have remained in Kent; he is often described as being of Spelmonden or Horsmonden, implying he was based near the ironworks in the Browne home there. Thomas Foley became the London face of the business and his children, born in the 1650s, were all christened in London churches. It was usually his name that was recorded in the Ordnance Office and East India Company records as attending meetings or signing documents.

The business of gunfounding for the government followed a regular pattern. The Ordnance Office, who controlled the supply of ordnance and its ammunition for both land and sea forces, issued warrants, stating the calibre and number of the guns needed, often with details such as type, weight or length and the date by which they should be received into government stores. From this the gunfounder worked out a campaign of casting. If the order was large, more furnaces could be brought into use, or further partners engaged. After casting, the guns were bored or reamed out; this was often done at Snodland in the Brownes' time where the guns for the State were usually proofed. Proofmasters, clerks and labourers would descend for days at a time to the Wealden countryside while they proofed and checked the guns. Transport was then arranged, either by river from Millhall, or by sea if

- 3. ESRO, SAS-CO/1/16/234.
- 4. TNA, PROB 11/217/122.

works nearer the coast were being employed. Unfortunately, it is not always possible to follow all the details of the Brownes' partnership's dealings with the Ordnance and Navy Boards; the complete run of Bill Books does not begin until the year 1655 while the Letter, Minute and Debenture Books have notable gaps from this period. Of course the government was only one of the partnership's customers; the Brownes kept the market at Tower Hill supplied with cannon for private trade and for civilians, such as sea captains or merchants, as well as foreign governments and regular large customers like the East India Company.

In 1651 the immediate task facing George and Thomas was to complete John Browne's outstanding contracts for 76 cast-iron demi-culverins for three new frigates for Parliament's Navy; these were proofed and received into store by August 1651.⁵ Within a short time, the gunfounders were presented with their first challenge, the outbreak of the third phase of the Civil War, with the arrival of the future Charles II in the country, battles at Worcester and Dunbar, followed by Cromwell's campaign in Ireland. These events needed only moderate orders of field guns, mortars, some guns for sea service but a great deal of ammunition. The orders through the winter of 1651-2 included an unusual piece, a cannon of eight, the largest gun in the system, weighing 97 cwt, almost 5 tons, as well as two large heavy demicannons of over 70 cwt each.⁶

However more important and challenging work was looming. Parliament had embarked on an ambitious programme of ship building for the Navy but it seems they could build ships faster than the gunfounders could cast guns. Browne and Foley received a contract in February 1651/2 for supplying 73 cast-iron guns from demi-cannon to saker drakes and ten brass guns.⁷ However the delivery of these pieces was months away and, to meet the emergency, in March 1652 the Admiralty and Navy Boards conferred on the possibility of buying iron guns, which had been cast for the merchant market, from "Mr Browne's storehouse" (*CSPD CW, vol 4*, 173). After a visit by an Ordnance official, 141 guns were selected to supply their immediate needs ranging in size from culverins and demi-culverins down to sakers

- 5. TNA, WO 49/85, f37.
- 6. TNA, WO 49/86 f165v.
- 7. TNA, WO 49/85, 45-47.

(Brown 2000, 42).

The Ordnance were now pursuing a new strategy of gun supply, widening their pool of contractors beyond the Brownes, to include Robert Cheek, a former employee of the Brownes, and Nathaniel Powell, a Sussex lawyer who had furnaces at Ewhurst, Northiam and Brede, the last of which was probably equipped for gun production. However this seems to have backfired. In May 1652 the Proceedings of Council of State noted "The Ordnance committee to consider what has been represented concerning the Badness of the new iron guns, examine the parties by whom they were made, and report their answers" (*CSPD CW, vol 4*, 264). As Cheek vanishes from the list of contractors it seems he was probably the culprit.

Through the summer and autumn of 1652 Browne and Foley were busy meeting the heavy demands of the Navy as the main suppliers of guns to the state; Powell trailed well behind in the numbers he provided.

Supplying the Navy at War

During the summer of 1652 tensions between the two republics, England and the Dutch state, escalated. There were a number of incidents until finally, in July 1652, the English government declared war on the Dutch, a war which would be waged at sea, meaning new ships and new armaments were needed at very short notice. And, as the fighting continued, they needed replacement guns and fresh ammunition on a regular basis.

Decisions needed to be made on the various orders by the Navy and the Ordnance – were the guns to be drakes? – that is shorter, lighter guns – or double-fortified – longer and heavier; was the iron to be ordinary or of fine metal, the more expensive option? And how many guns of each calibre would be needed? And dates were needed to arrange for the finishing of the contracts. While the partnership carried the smaller and medium range of pieces at their storehouse, the large calibre guns – long demi-culverins and the large demi-cannons had to cast specially (and would be difficult to dispose of if rejected) (Brown 2000, 47).⁸ To meet this demand the partnership needed to make use of other ironworks such as Scarlets Furnace,⁹ as well as the forges

^{8.} TNA, WO 47/2, f68.

^{9.} Herefordshire Archives and Record Centre, E12/VI/B.

at Bayham¹⁰ and Benhall (Parsons 1882, 26).

The first of the deliveries took place in January 1653, when a number of cast-iron pieces were accepted, along with large quantities of assorted ammunition: round solid shot from cannon of seven down to the 4-pounder minion, double-headed cast-shot, cross-barred shot, cast-iron hand grenades and burr shot.¹¹ At the same time the gunfounders were given contracts to cast new bronze pieces for the navy: 6 demi-cannon of 8½ ft, weighing 46 cwt; 6 culverin of 10 ft weighing 44 cwt each and 4 demi-culverin of 10 ft weighing 32 cwt, all to be cast from old and broken guns and chambers, to be delivered in as short a time as possible.¹² The light weight of the demicannons suggest they might have been drakes. Unfortunately we do not have the payments for these pieces, but the recent raising from the wreck of the *London*, lost in 1665, of Commonwealth bronze demi-cannon within this weight range suggests the order was indeed carried out (Fox 2015, 23).

In April, more ammunition was delivered, quickly followed by more deliveries of much-needed shot.¹³ By summer 1653 the foundries of the Weald were running at full tilt to fulfil their contracts and in July the gunfounders agreed with the Ordnance on the details of delivering their shares of the 1500 guns needed, in regular batches of about 200 between October 1653 and the following October in 1654 (Brown 2000, 48).¹⁴

At about this time there were two changes in the partnership. In September 1653, George Browne married for a second time, but this time he had set his sights higher, marrying Elizabeth Browne, daughter of Sir Ambrose Browne of Betchworth, from a higher status in society than any of his family's previous marriages. Shortly before this, to go with his new dignity, Browne acquired an estate close to his wife's family's properties in Surrey at Buckland, as well as a second estate in Hampshire at Wolverton, which would be the future property of George, his son by his first marriage (*VCH Surrey 3*, 1911, 172-3; *VCH Hampshire 4*, 1911, 271-2).

Secondly, from this time on we have increasingly frequent mentions of

- 10. Kent History and Library Centre, U840/T5.
- 11. TNA, WO 49/85, f64v.
- 12. TNA, WO 47/2, 52r.
- 13. TNA, WO 49/85, f66; WO 47/2, f86v.
- 14. TNA, WO 47/2, 114v.

Henry Quintin or Quintyne - various spellings are found - who had been associated with the Browne family under George's father John. Henry, his wife and daughter Anne had all received legacies from John Browne's will. His name alone is often attached to orders for ammunition and it was Quintin, as their agent, who arranged with the Ordnance the details of casting a series of bronze guns as well as iron pieces for new frigates in December 1653. Earlier the Navy had asked the Ordnance about the armament of the new frigate being built at Blackwall - the future Marston Moor - and it was decided that if they could not find enough brass guns in store, new ordnance should be cast from old or cracked pieces.¹⁵ By December the Ordnance had decided which new brass guns for the frigates were needed, as well as iron pieces. Henry "Quintyne, agent for George Browne and Thomas Foley" was given contracts "to cast new brass and iron guns for 6 new frigates building, to be delivered to the Tower of London before February next". Richard Pitt at the old Tower foundry had orders for a further 10 demi-culverins.¹⁶ Again the payments for these guns has not been identified so that we do not know if they were delivered, and in the spring of 1654, in the wake of the end of hostilities, the Ordnance Office issued orders to stop casting cannon (Brown 2000, 52). Of Browne and Foley's 900 iron guns ordered, 390 had passed proof and gone into store, 430 were cast but not yet proofed and 80 were still uncast. They were told to finish casting the last guns. In July and August 1654, Ordnance officials visited Snodland to complete the proofs and paperwork. Despite this it took some time to agree on what had been done and what money was owed. It was not until April 1655 that the accounts were finally agreed.¹⁷ Some of the guns cast in this campaign have been identified by the Commonwealth's arms on them. One such example is the culverin drake found some years ago off the coast of the Netherlands and now on display at the Royal Armouries in Fort Nelson, near Portsmouth (Wilson 1988).

However while these orders were being finished off, another prestigious project was about to begin – the arming of the *Naseby*.

- 15. TNA, WO 47/2, f152v; f153v.
- 16. TNA, WO 47/2, f168v.
- 17. TNA, WO 47/3, 99.

Arming the Naseby

On September 2nd 1654 George Browne and Thomas Foley, through their agent Henry Quintin, undertook to cast 70 brass guns for the "frigate now building at Woolwich" – the *Naseby*, Parliament's great 80-gun three-decker – to be delivered before 1st March next (we will see that turned out to be too optimistic by far). The warrant detailed the calibre, length, weight and number of the guns needed and further they were to be engraved with the Arms of the Commonwealth and to "bee well and exactly formed as any brass ordnance have beene formerly made".¹⁸ Unlike the iron guns, where Browne was paid for the metal as well as the casting, for this project Browne was paid only for workmanship in casting the guns, the metal was supplied by the state. They were allowed all the copper lately bought of Sir Bulstrode Whitelock, the recently returned ambassador to Sweden, one of the most important suppliers of copper in this period. They were not the sole founders employed; Richard Pitt at the bronze foundry at the Tower had a small share of the some of the lighter Naseby pieces.

The first thing needed was the material; the newly bought raw copper earmarked for the project from Sweden would not be nearly enough to cast 70 brass cannon. In August the Admiralty had already been told that the contracts needed to be let soon, because it would soon be difficult "conveying the metal, as the ways will grow bad" (*CSPD CW, vol 7*). During November 1654 Ordnance officials went down to Chatham and other depots to look for old brass ordnance and in January 1655 12 brass 6-pounders from the ship *Success* were judged defective. These were weighed and sent to the founders for the *Naseby*.¹⁹ Fresh supplies of raw copper were also regularly purchased while the Admiralty suggested that England's copper mines could be exploited for making ordnance in the future.²⁰

The first guns were ready by February and March 1655 and were taken to Snodland on the Medway where they were reamed out to make sure the bores were smooth and made ready for proof. Powder and shot were sent from Chatham and Ordnance officials travelled to Snodland where the labourers rolled the cannon to the butts and set them up. Richard Wollaston, the

- 19. TNA, WO 49/87; WO 47/3, f62r; WO 47/3, f78v.
- 20. TNA, WO 49/88, f16v.

^{18.} TNA, WO 47/3, f43r.

Master Gunner of England, took charge of the actual proof which consisted of firing the guns with a double charge of gunpowder, while George Payler, the Master Surveyor, checked the guns for faults. The labourers then weighed the proofed cannon while the clerks noted their weights, lengths and calibres for future bills. From there the guns were shipped to the Ordnance depots along the Thames or direct to one of the naval dockyards in an emergency; altogether 129 brass and iron guns were proofed in these months, an impressive number.²¹

The procedure was repeated between 15 and 21 April 1655 when another ten Naseby guns, along with a large number of iron guns were proofed by Mr Franklyn, the proof master, at Snodland.²² By mid-June the next batch was ready for proof and later that month Foley and Browne put in a bill for the first group of cannon for £1,535 2s 10³/₄d to cover 15 cannon of seven, seven culverins, and seven demi-culverins; 29 of the guns in all.²³ For comparison, within this same period Mr Pitt at the Tower Foundry delivered three demiculverins.²⁴ During the summer months the roads were easier to use, so now six more tons of copper were delivered to the foundry in July 1655, followed by another batch of old brass guns.²⁵ In January 1656 the Ordnance messenger was sent down to Kent to check whether more cannon were ready for proof; clearly the answer was favourable as the Ordnance officers and labourers descended on Snodland later that month to proof eight more Naseby guns.²⁶ In February yet another six tons of copper were needed for the project.²⁷ By July the last recorded batch of 14 Naseby guns were ready – the massive cannon of seven, 12-foot-long demi-cannon and seven smaller pieces.²⁸ In all Browne and Foley had bills for 57 bronze guns for the *Naseby*, together weighing about 125 tons.

- 21. TNA, WO 49/87, ff117r, 131v, 134r.
- 22. TNA, WO 49/87, ff135-135v; WO 49/89.
- 23. TNA, WO 49/87, f158v; WO 49/88, f11r.
- 24. TNA, WO 49/88, f14r.
- 25. TNA, WO 49/88, f16v; WO 49/87, f198v.
- 26. TNA, WO 49/89.
- 27. TNA, WO 51/2, f9v.
- 28. TNA, WO 51/2, f23r.

The late Commonwealth years

Work on the prestigious *Naseby* guns did not halt progress elsewhere on the bread and butter of the ordnance business, supplying the merchant market in London. Frequent deliveries of smaller cast-iron guns were sent up to customers on a regular basis (Farrow, 1984, 109). In the summer of 1656, the Ordnance realized that the Admiralty had an urgent need for some guns; "As they have not sufficient guns in store to supply the new ketches building at Portsmouth and Chatham, desire order for buying them of the founders, who have some at Portsmouth, and this will avoid the hazard and charge of transportation" (*CSPD CW, vol 10, 395*). In August 1656 Quintin delivered 10 iron sakers to Portsmouth and a few weeks later, 10 saker cutts for the *Chestnut* ketch.²⁹ In November the officers were writing to inquire "the number and sizes of iron ordnance, consisting of demi cannon, culverins, and sakers, in the possession of Thos. Foley, at Snodland, co. Kent; having been cast for the State, and having the arms of the Commonwealth engraven upon them, they would be very fit for the fleet" (*CSPD CW, vol 10, 456*).

However this period also marks a disappearance as, from mid-July 1656, George Browne's name is missing from the Ordnance papers – the active members of the partnership are now Foley and Quintin. Why George Browne took such a step back is not known; perhaps he was now spending more time in Buckland and Wolverton with his young and growing family. The Buckland records show at least seven of George and Elizabeth Browne's babies christened there between 1554 and 1564.³⁰ His wife's family, the Brownes of Betchworth, had been more active in political life than his previous inlaws. His father-in-law, Sir Ambrose, had been a moderate Parliamentarian and member of Parliament during the 1640s until he was excluded under Pride's Purge. Like George Browne, he had been accused of secret Royalist sympathies, while his brother-in-law Adam Browne, a colonel in the cavalier army, had been very active during the Civil War on behalf of the king.³¹

Whether George took an active decision to distance himself from the

^{29.} TNA, WO 49/91, 16v.

^{30.} https://theweald.org/N10.asp?ID=4096 (accessed 16 February 2023).

^{31.} https://www.historyofparliamentonline.org/volume/1604-1629/member/browne-sirambrose-1589-1661 (accessed 1 May 2023); https://www.historyofparliamentonline.org/ volume/1660-1690/member/browne-adam-1626-90 (accessed 1 May 2023)

Cromwellian regime, whether he had decided to take a real back seat and leave the business to Foley and Quintin or if he was still directing operations in the shadows at the ironworks can only be guessed at. Perhaps in the late 1650s it was more expedient to let Foley run the ironworks while George became a country gentleman.

Henry Quintin appears to be the driving force in the new arrangements. At some point he relocated himself from Kent to London - in his will he describes himself as gentlemen of the Liberty of the Tower of London, the headquarters of the Ordnance Office.³² He wrote to the authorities about his new offer to cast cannon of seven in iron for the London. The story of the iron cannon of seven has already been published here (Brown 2000, 53). Certainly in September 1664 when George Browne had resumed his part in the gun-founding business, he wrote of his doubts to the Ordnance in response to a query about casting cannon of seven in iron that "Cannon of Seaven cannot well be made but of Brasse in regard they will be soe heavy yt. Iron metal (wch must be run all at one time into ye mold) being kept soe long as foure nights & days if not more in ye hearth wilbe a in very great danger of cooleing in ye hearth when it should run", although he did agree to try if necessary (Smith 1992, 16). Quinton was expanding his interests well beyond the iron industry. With a colleague Martin Noel, he had been awarded a large contract for farming the customs on salt in Scotland (CSPD CW, vol 11, 206; CSPD CW, vol 12, 113).

However this new state of affairs did not last long. In February 1658, Henry Quintin was sick enough to draw up his will, leaving the bulk of his estate to his daughter Anne and his wife, with a legacy to Thomas Hunt, his servant (and a future gun-contractor). Quintin died a month later. The Quintin family involvement ended with the Ordnance payments to Anne for 43 cast-iron guns for the fleet on 17 March 1658.³³Martin Noel may have replaced him briefly in the partnership, since along with Thomas Foley, he attended a Court meeting to try and sort out a problem with the East India Company in May 1658. The Company and the partners were trying to untangle an order in which Quintin had been involved – three bronze 8-inch mortars and a large quantity of shells which had been purchased by

- 32. TNA, PROB 11/274/149.
- 33. TNA, WO 51/2, f90r.

private individuals for sale in India. There was some dispute whether this was against the Company's regulations, but eventually the partnership were able to avoid blame on the subject and still supply a large number of shells for export. However by 1659 Noel has vanished from the Company records and it is Foley's name alone associated with ordnance payments (*CEICo*, 259-61, 316, 326).

These were not the only mortars being cast by Foley. In May 1658 the Ordnance paid Foley for three bronze mortars in different sizes $-18\frac{1}{2}$ in, $14\frac{1}{2}$ in and $12\frac{1}{2}$ in, weighing over three tons; the payment included "For graving of His Highness and the Commonwealth arms". These were probably the mortars the English sailor, Peter Mundy saw being tried on Hackney Marshes (Anstey and Temple 1936, 99-104).³⁴

From this time it is usually only Thomas Foley's name mentioned in the official records in connection with the gun trade. An exception is one of John Browne's old workmen, Thomas Hester, who was paid for boring out brass guns at Snodland in August 1658.³⁵ March 1659 marked the date of a new project – the Ordnance wrote to the Committee of the Admiralty and Navy, noting that in their stores there were 40 tons of broken brass ordnance and 18 culverins "too light to carry a ball of that weight". They foresaw a want of demi-cannon guns for the new 3rd rates and new 2nd rates. They had treated with Mr Foley to have this metal delivered to him, to be cast into 24 new brass demi-cannons to be home-bored, weighing 2½ tons each, to be delivered to Snodland on the Medway before the last of May next.³⁶ Throughout 1659 the Ordnance were again sifting through old bronze pieces to find guns to be recast.³⁷ By the following spring 24 demi-cannon and 8 demi-culverins of brass had been delivered by Foley, along with a number of cast-iron pieces.³⁸

However the world was changing as these pieces were being proofed and received into the government stores. In May 1660, the *Naseby* sailed for the Netherlands to collect the new king and returned as the newly named *Royal Charles*. Samuel Pepys noted in his diary that he had fired a gun in the fleet,

- 34. TNA, WO 49/91. f102v.
- 35. TNA, WO 49/90, 146v.
- 36. TNA, WO 47/3, 245, 246v.
- 37. TNA, WO 49/92, ff40-41, ff73-74v; WO 49/93, f59.
- 38. TNA, WO 49/91, f136v.

rather too enthusiastically as he damaged his eyes, surely one of the Browne's cannon (Latham and Mathews 1970, 153). The Restoration of Charles II also marked George Browne's return to gunfounding for the next decade.

Following the Restoration, the aged Sir Sackville Crowe tried to reclaim his patents on gun-casting from the days of King James, claiming that "Browne obtained a new patent, and has made great profits by selling ordnance, at greater rates than allowed, both to the late king and his enemies, and now he solicits a new grant; suggests whether he should not be called to account for his undue profits, and whether such a trust should be granted to one who has used it for His majesty's enemies" (*CSPD*, *CII*, *Vol 1*, 186). In response the Brownes sent a petition to the king, reminding him of their father's sufferings on his behalf (*CSPD*, *CII*, *Vol 1*, 385).

Bibliography

Anstey, L. M. and Temple, R. C. (eds.), 1936, The Travels of Peter Mundy, in Europe and Asia, 1608-1667 Volume V. Travels in South-West England and Western India, with a Diary of Events in London, 1658-1663, and in Penryn, 1664-1667 (London, The Haklyut Society Second Series, 78).

Blackmore, H. L., 1976, *The Armouries at the Tower of London*, 1 Ordnance (London, HMSO)

Brown, R. R., 2000, 'Notes from the Office of the Ordnance: the 1650s', *Wealden Iron*, 2nd ser. 20, 39-55.

Brown, R. R., 2004, 'The Ordnance Records: Thomas Browne' *Wealden Iron*, 2nd ser. 24, 16-25.

Brown, R. R., 2005, 'John Brown, gunfounder to the King Part 1', *Wealden Iron*, 2nd ser. 25, 38-61.

Brown, R. R., 2006, 'John Brown, gunfounder to the King Part 2.' *Wealden Iron*, 2nd ser. 26, 31-50.

Brown, R. R., 2008, 'John Brown, gunfounder to the King Part 3' *Wealden Iron*, 2nd ser. 28, 23-32.

Calendar of State Papers Domestic, The Commonwealth (CSPD CW) vol. 4 1651-2 ed. M. A. E. Green (London, 1877).

Calendar of State Papers Domestic, The Commonwealth (CSPD CW) vol. 7 1654 ed. M. A. E. Green (London, 1880).

Calendar of State Papers Domestic, The Commonwealth (CSPD CW) vol. 11 1657-8 ed.

M. A. E. Green (London, 1884).

Calendar of State Papers Domestic, The Commonwealth (CSPD CW) vol. 12 1658-9 ed. M. A. E. Green (London, 1885).

Calendar of State Papers Domestic, Charles II (CSPD CII) vol. 1 1660 ed. M. A. E. Green (London, 1860).

A calendar of the court minutes etc. of the East India company (CEICo) 1655-1659 ed. W. Foster (Oxford, 1916).

Edwards, S., 1996, Children of the Weald (Tonbridge, author)

Farrow, G. W. E., 1984, 'Iron gun-founding in the mid-17th century. The winter blowings at Horsmonden 1656 and 1659', *Historical Metallurgy*, 18, 2, 109-111.

Fox, F. L., 2015, 'The London of 1656: her history and armament', *Journal of the Ordnance Society*, 23, 15-44.

Latham, R. and Mathews, W. (eds.), 1970, *The Diary of Samuel Pepys Vol 1: 1660* (London, Bell).

Parsons, J. L., 1882, 'The Sussex ironworks', Sussex Archaeological Collections, 32, 19-32.

Smith, R. D., 1992, 'Iron Cannon of 7', Journal of the Ordnance Society, 4, 9-20.

Victoria County History (VCH)– Hampshire Volume 4, ed. William Page London, 1911. 271-2

Victoria County History (VCH) - Surrey: Volume 3, ed. H E Malden. London, 1911. 172-3

Wilson, G. M., 1988, 'The Commonwealth Gun', *International Journal of Nautical Archaeology*, 17, 87-100.

SOME PROBATE INVENTORIES MENTIONING IRONWORKS

J. S. Hodgkinson

An under-appreciated source, inventories or schedules of the equipment at Wealden forges and furnaces are generally found attached to leases of ironworks, with the earliest, though brief example being that of Newbridge in 1510.¹ Other published ones are those associated with Benhall Forge in 1652,² and the works in Witley and Thursley in 1666.³ Another source of similar information are probate inventories, of which two have been previously published in *Wealden Iron*: Birchden Forge and Hamsell Furnace in 1619 and again in 1708.⁴ In some instances they can reveal information about ironworks not contained in surviving, contemporary leases and conveyances. An interesting group is to be found in the National Archives compiled in a limited period from 1660 to 1700.⁵ Among them are a few relating to people associated with Wealden ironworks of which an even smaller number include stock relating to their works. The amount of detail varies considerably but some provide an important record of the stock and equipment held at furnaces and forges.

Edward Herbert, Tonbridge, 1684

Like Robert Baker's of Hamsell, which was drawn up following his bankruptcy, Edward Herbert's inventory is of a gun foundry and therefore

2. J. L. Parsons, 'The Sussex Ironworks', *Sussex Archaeological Collections* (hereafter *SxAC*), **32** (1882), 29.

- 3. M. S. Giuseppi, 'Rake in Witley', Surrey Archaeological Collections, 18 (1903), 50-2.
- 4. M. J. Burchall, 'Richard Maynard Yeoman and Ironmaster', *Wealden Iron*, 2nd ser., **3** (1983), 18-24; A. Dalton, 'Inventory of the ironworks at Hamsell in 1708', *op.cit.*, 8-11.

5. The National Archives (hereafter TNA), PROB 4.

H. R. Schubert, *History of the British Iron and Steel Industry* (London, Routledge, 1957), 393.

includes a range of items specifically related to that trade.⁶ From as early as 1588 guns had been cast at Barden and from 1646 at least, when it was visited by Sir James Hope, it had been one of the furnaces operated by the Browne family, members of whom had successively held the title of Gunfounder to the King. Edward Herbert is first noted as "Clarke of Iron workes to a furnace in Tunbridge" in 1653,7 most probably at Barden, and had thus been associated with the Brownes since before then. In 1660 he had been one of the trustees who reassigned the lease of Barden to George Browne and Alexander Courthope, it having previously been held by John Browne who had died in 1651.8 George Browne renewed the lease in 1664 but by 1670 Edward Herbert was tenant of the works, implied by the fact that the items listed at the furnace were treated as Herbert's own property. He and the furnace are mentioned briefly in the inventory of the founder Mathew Dimond, who died in 1670. A single item records "Stock at Barden Furnace besides what shall appear uppon accompt to bee made with Mr Herbert for the proffitt thereof - £400."9

After Edward Herbert's death parish rate books indicate that his son George took over the running of the furnace until 1700.¹⁰ The inventory, which runs to four rolls, includes all the contents of his house and farms. Chalklin has described his property which, in addition to the furnace and Barden Farm, also included Holden Farm at Southborough, later to be occupied by another ironmaster at Barden, William Bowen.¹¹ Only the part relating to the ironworks is transcribed here.

At the furnise called Barden used by the deceased	£	:	s	d
One payre of furnise Bellowes	5	00) ()0
One great Cable Two Rouls ¹² one old Cable	1	00) ()0

- 6. TNA, PROB 4/14947, 6 & 7 March 1683/4.
- 7. TNA, PROB 11/230/187; Will of George Scrace of Pyecombe, his father-in-law.
- 8. Herefordshire Archive and Record Centre, E12/VI/Bc/2.
- 9. TNA, PROB 4/25629, 24 Nov 1670.

10. C. Chalklin, 'Iron manufacture in Tonbridge parish', *Archæologia Cantiana*, **124** (2004), 110.

- 11. ibid., 107, 110.
- 12. Rollers.

Shott moulds Cages ¹³ & other old cast iorne about the furnise	5 00 00
In the worke house ¹⁴	
About five tun of potts	100 00 00
Noell Barrs ¹⁵ boreing barrs and other iorne tackling belonging to guning	& potting
	22 10 00
Wyer in the workehouse	0 10 00
<i>Twentie iorne platts</i> ¹⁶ <i>fower pigs</i>	6 00 00
The boreing Carriage ¹⁷ and things belonging to it	0 10 00
Bricks & tiles	0 05 00
In the Smythes forge	
One payer of Bellowes Two Anvills one Bickiorne ¹⁸ a vice sledges & tong.	3 1 15 00
Three hundred and a halfe of iorne	2 13 00
Two beames scales & weights Two gun chaines one payer of pully blocks	and Ropes
	6 00 00
Fower cole waynes gun patterns ¹⁹ shovells spads and old Bellow bords	5 00 00
At the furnise and elsewhere	
Ready drawed out of the ground iorne mine to the vallue of	6 00 00
Wheele barrows and Cole basketts	0 10 00
<i>Timber about the furnise</i>	1 00 00
Paid to severall workemen for cutting wood for the next Blowing	12 19 00

13. The framework enclosing gun moulds prior to casting, and to which the cascabel mould was attached.

14. The same term was used for a building marked on a map of 1743 at Cowden Furnace and recently shown to have survived.

15. The iron bars around which the cores were built that were inserted into cannon moulds to form the barrel.

16. These could be forge hearth plates or firebacks, both of which were cast at a furnace.

17. The carriage on which a cannon that was to be bored was secured so that it could be winched towards the rotating boring bar. The wheels for such a carriage were found during excavations at Pippingford Furnace. In the Hamsell inventory the 'boweing carriage' is probably the same, the 'w' being a misreading of 'r'.

18. A specialised, small type of anvil consisting of two projecting tapering ends, used for forming hoops.

19. These would be the strickle boards used to define the outline of the gun when the clay model was being formed by the moulders.

Guns lyeing on Mr Paule Lymbeys ²⁰ wharffe at Woolwich	
Amounting to the vallue of	170 00 00
One & Twentie granado shells ²¹ lyeing at Mill hall in Kent ²²	10 00 00

Of interest is the large quantity of pots. Pot founding was carried on at several furnaces in the Weald, including some of those mentioned below. Some pot founders were itinerant but Barden appears to have been a furnace where pot production was carried out on a regular basis, as the next individual shows.

William Turner, Tonbridge, 1680

Turner, a pot founder, had been based at Barden for at least 30 years when he died.²³ Nowhere near as detailed as Edward Herbert's, his inventory nevertheless lists among his personal possessions pots and kettles in his house amounting to 16 gallons valued at 1s 6d a gallon, as well as 10 little skillets and pots and two mortars, presumably products of his trade.²⁴ The inventory also includes "potts newly cast lyeing at Cowden furnace" valued at £200, indicating that Turner did not work solely at Barden. However it seems that he had been working at both furnaces in Cowden for in his will he gave a sum of money to Richard Knight who owned Scarlets Furnace, and Robert James who rented it from Knight, from which they were asked to pay an annuity to Turner's wife. A substantial quantity of pots are listed in Robert James's inventory, below.

Richard Knight, Cowden, 1681

Richard Knight's own inventory does not mention his furnace at Scarlets,

20. Paul Linby, Labourer in Ordinary at the Office of Ordnance, and one of the witnesses to the will of John Browne in 1651.

21. Hollow cannon balls which, filled with gunpowder and a fuse, were fired from mortars.

22. On the left bank of the tidal River Medway, opposite Aylesford Priory and downstream from Maidstone; warehouse, yard and wharf used by the Browne family of gunfounders.

23. TNA, PROB 11/362/132; Will of William Turner of Bidborough, Pot-founder.

24. TNA, PROB 4/18775, 29 Jan 1679/80.

because it was tenanted by Robert James, below.²⁵ Instead, it lists "Stock belonging the furnace & the forge at Tenchley" which reveals a hitherto unrecorded partnership in the ownership of Tinsley Forge, then in Worth parish in Sussex, at which a furnace had also been noted in two previous documents, in 1606 and 1630.²⁶

Stock belonging to the furnace & the forge at Tenchley.

Two Third parts of the Mine at the furnace w ^{ch} belonged to Mn	r Knight being in the
whole about 900 loads	100 00 00
ffor Two Third ptes of the sows being about 130 Tun in y ^e who	le for Mr Knight's pte
	473 06 08
Two Third parts of the potts at the furnace being about six Tur	n & a halfe
in all soe Mr Knight's pte is	86 13 04
Two Third pts of about 2 Tunn & a halfe of boxes	21 13 04
Two Third pts of Ten old colewens [coal wains]	05 00 00
Two parts of a pair of Bellowes Anvill and vice	03 06 08

Two Third pts of all the stocke at Tenchley forge which belonged to Mr	Knight Mr
Leonard Gale being satisfied £280 due to him for that stocke	517 14 04
Due from Mr Jeremy Johnson Two Third parts of £600 due on bond	400 00 00
Two Third parts of £260 due upon booke debts	173 13 04
<i>Two Boates belonging to y^e furnace ponds</i>	01 00 00
Due from Mr James for a Quarters Rent due att Christmas last past	12 10 00
Due from his Tenn ^{ts} at Brenchley wch is desparate	12 00 00

Leonard Gale had bought Tinsley Forge from Thomas Bowyer in 1669 having previously leased it. The Gales, the Knights and the Johnsons were related through marriage, Leonard Gale's wife, Philippa being Jeremy Johnson's daughter and sister to Richard Knight's wife, Sarah. The latter's daughter and heir, also Sarah, would later marry Gale's namesake son bringing Scarlets Furnace into his possession, the young Leonard Gale having been counselled by his father to acquire one of the Cowden furnaces.²⁷ How or why Richard

25. TNA, PROB 4/3963, 17 May 1681.

^{26.} West Sussex Record Office, Lytton/125, 3 Nov 1606; London Metropolitan Archives, ACC/1360/127/4.

^{27.} R. W. Blencowe, 'Extracts from the memoirs of the Gale family', *SxAC.*, **12** (1860), 48-52.

Knight came to have a two-thirds holding in Tinsley is not known. Knight's tenants at Brenchley who owed the 'desperate' debt (basically a bad debt) may well have been the Browne family, previous tenants of Scarlets Furnace, who were in financial trouble as a result of their over-production of the 'nealed and turned' guns.²⁸

Robert James, Cowden, 1695

As tenant of Scarlets Furnace, Robert James's inventory provides the detail which his landlord Richard Knight's lacked. However, rather than being listed in a separate section the stock and equipment were grouped together with other pieces of James's domestic and agricultural property as "Things without doors".²⁹ The following list has, therefore, omitted items not relating specifically to iron-making

<i>Three waggons with the tyers belonging to them and one sow carriage</i>	
& a shott carriage	20 05 00
Sixty & three tun of carcases at thirteene pounds & ten shillings pr tun	850 00 00
Sixty tun of Boome shells at ten pounds pr tun	600 00 00
For a load of iron potts and boxes	24 00 00
Twelve tun of iron potts at twelve pounds pr tun	252 00 00
Due and owing upon bookes debts and for money lent as the bookes	
ఈ writings make appeare	2495 00 00
Due and owing for rent	405 00 00
Paid towards a stock of wood & myne and to carriers wood cutters	
and myne drawers to be brought to the furnace and for the stocks of	
this present yeare	481 15 00
Twenty tun of sowes at six pounds and ten shillings pr tun	130 00 00
Eight hundred of Barr iron at seaventeene shillings per hundred	6 16 00
One tun of sow iron converted to Hamers & other things	7 00 00
A sett of shott weights	0 15 00
Four cold chizells	0 04 00
Five wrought hamers	0 07 00

28. S. Barter Bailey, Prince Rupert's patent guns (Leeds, Royal Armouries, 2000).

29. TNA, PROB 4/16759, 16 May 1695.

Two myne hamers and sume coal basketts one bushell	0 10 00
One measuring vate	0 07 00
One measure & other things	0 02 06
One hundred and twenty paire of shott moulds	10 00 00
Two turne sowes	0 04 00
Three iron rakes and a low barr	0 08 06
One picke two spades and four shovells	$0\ 07\ 04$
Five wheele barrowes	1 05 00
Two pair of shell moulds	1 10 00
Three pair of tongs	0 06 08
A pair of bellowes for the furnace	25 00 00
Eighteene coalwaynes	18 00 00
Six large long Ringers	2 00 00
Six little Ringers	1 10 00
An iron constable ³⁰	1 06 08
Four Hargers ³¹ and four sleepers and six ladles	2 05 00
A Twere hooke and an iron placket ³²	0 04 00
A stoping hooke and a sinder hooke	0 06 00
One hamer mould one anvill mould & one hurst mould	0 07 06
One beame and scales at the furnace	0 13 04
Two weights of one hundred weight each	1 00 00
One pair of stillyards and a halfe weight and chaines belonging to it	2 05 00
Two fourteene pound weights one seaven pound weight and one	
four pound weight	0 05 00
For a beame and scales in the Iron house	0 12 00
Three halfe hundred weight two quarter hundred weight and one 14 li	
weight & one four pound weight	1 08 00
Twelve coffer moulds	1 16 08

30. "A bar of very great substance and length, kept always by a furnace in readiness for extraordinary purposes in which uncommon strength and power are required." H. G. Nicholls, *Iron making in the Forest of Dean* (1866, 1981 reprint), 39; I am grateful to Peter Crew for providing me with this reference.

- 31. No definition available.
- 32. Possibly some sort of iron plate; perhaps a variant of placard.

Seaven hundred loads of myne at three shillings and six pence pr load	
at the furnace	122 10 00
Ten load of stones brought home at five shillings pr load and twenty	
load of stones at three shillings pr load	5 10 00
Five and twenty loads of charcoal at the furnace	25 00 00

In addition to the manufacture of iron pots the presence in this inventory of stock and equipment associated with the production of shot and shells (carcases, 'Boome' shells etc.) is a reminder that Scarlets was one of several furnaces where William Benge, who had succeeded to the title of Gunfounder to the King in 1692, was casting munitions on short-term arrangements with their occupants.³³

Edward Swaisland, Cowden, 1662

Edward Swaisland's inventory only briefly mentions Cowden Furnace, which he owned, but more significantly reveals stock at a forge he operated, but with which he has not previously been associated.³⁴ The location of his forge is not identified, the nearest being Cansiron Forge, just to the south in Hartfield, which in 1662 had recently reverted, after confiscation during the Commonwealth, to William, Lord Craven, an absentee landlord. Cowden Furnace would have been in the hands of George Browne and Alexander Courthope at the time, which may explain why little stock at the furnace was included in Swaisland's inventory. Reference to the hammer and the forge separately does not imply two different works; they would have been in the same building but they were respectively the responsibility of different forgemen: the hammerman and the finer.

In the hamer

Imprimis Nynteene tonn of iron	155 00 00
Lost iron working tooles bellows & other things belonging to the hamer	21 00 00
Two & twentie loads of coales	21 00 00
Five coards of wood	0 10 00

33. R. R. Brown, 'Notes on Wealden furnaces in the records of the Board of Ordnance, 1660-1700', *Wealden Iron*, 2nd ser., **13** (1993), 28.

34. TNA, PROB 4/6107, 28 Oct 1662.

In the forge	
Imprimis a paire of bellowes one vice one beekiorne & two paire of tonges	0 11 00
In the fornace	
Imprimis two paire of bellowe weals	$4\ 00\ 00$
Two paire of Milstones	$14\ 00\ 00$
Things forgotten & old Lumber	1 00 00

Thomas Sands, Mayfield, 1668

The tenancy of a furnace in addition to the expected forge is indicated in the inventory of Thomas Sands, described as a hammerman.³⁵ There were several Thomas Sands, their lineage traced by the late Ann Dalton.³⁶ This is the one whose poorly-cast iron graveslab lies in the central aisle of St Dunstan's church. Sands leased Hawksden Forge in 1665 having been recorded at Coushopley Furnace seven year earlier. His inventory lists the stock at Hawksden but also at Mayfield Furnace, works with which, hitherto, he had not been associated.

At the end of the items from Thomas Sands' inventory, below, a number of debts owing to his estate were listed, among which were sums due from individuals, probably blacksmiths, for iron sold to them, and a 'desperate' debt owed by a William Hoad of Maidstone to whom the wrought iron in Kent had, perhaps, been destined.

Wrought Iron in the two Iron houses at the forge & in Mayfeild & at Lewes & in Kent

Sixty three Tunns and Seaventeene hundred in the two iron houses and tw	o Tunns
now in Lewes and two tunns ఈ a halfe lyeing in Kent	
in all Sixty eight Tunns & seaven hundred vallued at	683 10 00
Forty Tunns of Sowes at the forge vallued at	155 00 00
<i>Eleaven cast plates</i> , ³⁷ <i>fower anvills and two hammers there vallued at</i>	12 00 00
Coales laid down at the forge before the testators death vallued at	$51\ 05\ 00$
Of wood cutt at the forge wood & uncoaled vallued at	27 13 04

35. TNA, PROB 4/25627, 25 Jul & 24 Nov 1668.

36. A. Dalton, 'Hawksden Forge, Mayfield, and the Sands family', *Wealden Iron*, 2nd ser., **18** (1998), 39-47.

37. Unlike in note 15, these plates, being stock at the forge, would most probably have been for lining the forge hearths.

One hundred & twenty Tunns of Sow Iron at Mayfield furnace vallued at	
45	50 00 00
One hundred fifty & five loads of coales at Mayfield furnace vallued at	
11	16 05 00
Wood felled in the furnace Coppice & not coaled at his death vallued at	
1	0 16 00
Old Mine at the furnace vallued at	$5\ 00\ 00$
New myne lying at the furnace & at other places where it was drawen	
vallued at 2	20 00 00
Wood felled & uncoaled in Spitly ³⁸ coppice at the death & some spray	
faggotts there vallued at 4	ŧ0 17 00

Thomas Weller, Frant, 1670

Another forgemaster whose inventory includes some details of the stock at their works is Thomas Weller, of Frant, who had taken over the lease of Eridge Forge from his brother John in 1645.³⁹

Att the fforge

Fifty five tunnes of sows	252 00 00
Three tunns sixteene hundred of old wrought Iron one tunne fower	
hundred of new wrought Iron two Smyths anvills two plates fower	
halfe hundred waightes	63 04 00
Tenne hundred of sharemoulds ⁴⁰ and old forge tackle	
two old forge huches and two old plates two	
hundred of old cast iron one old wrought [illeg.]	5 10 00

John Newnham, Maresfield, 1691

Newnham who died in 1691 worked the forge at Maresfield and the furnace at Pounsley, which lay on the boundary between Framfield and Buxted

38. Now Spitlye; NE of Mayfield Furnace, S of Trulls Hatch.

39. TNA, PROB 4/6204, 19 Nov 1670.

40. 'A thick sheet of iron manufactured so that it can be shaped and sharpened into a ploughshare' (*Oxford English Dictionary*), a common product of Wealden forges. The quantity here is 10 hundredweight, not 1,000.

parishes. His inventory lists unspecific amounts of iron and charcoal at the forge, old guns and rollers in London and charcoal and iron at Lewes.⁴¹

Sir Nicholas Strode, Etchingham, 1683

Sir Nicholas lived at Chepsted in Chevening, Kent, but owned Lodge Farm and Church Farm and the forge in Etchingham. Reference to the last of these in his inventory is confined to the following:⁴²

Item the Iron belonging to the Hammer is dispersed into severall hands and other materialls belonging to the Hammerware yett unaccounted for and theire value att present cannot bee discovered.

Two other inventories, not included in the National Archives group, have recently been examined by the writer, those of Richard Streatfeild, of Chiddingstone, who died in 1601, and John Tufton, Earl of Thanet, who died in 1664.

Richard Streatfeild, Chiddingstone, 1601

It is not known when Thomas Browne sold Chiddingstone Furnace to Richard Streatfeild. Browne had been leasing it "for yeares" when he purchased it in 1589,⁴³ but sometime in the next 11 years it changed hands again and it was in Streatfeild's possession when he died. Browne had also assigned to Streatfeild the lease of Cansiron Forge in 1589, with nine years still to run, but evidently he did not renew the lease, perhaps because he had taken Pilbeams Forge near Ashurst in 1592, which was about three miles nearer to Chiddingstone Furnace. So when Streatfeild died the appraisers of his property only had the furnace and Pilbeams Forge to value.⁴⁴

At the hamer at Pilbeames

Imprimis wrought Iron one tonne ½ *at* £10 *the tonne*

15 00 00

- 41. TNA, PROB 4/18887, Feb 1691/2.
- 42. TNA, PROB 4/10105, 3 May 1683.
- 43. Kent History and Library Centre (hereafter KHLC), U1000/3/T5.
- 44. KHLC, U908/T303/3.

21 tonne ½ of blome Iron at £7 13s 4d the tonne	163 16 07
63 sowes cont 45 tonnes 13 hundred of sowe Iron at £3 3s 4d the tonne	
	144 10 07
220 lodes of coles at 13s 4d the lode	146 13 04
2 tonnes 14 hundred of old gonnes and gonne hedds at 46s 7d the tonne	6 06 07
7 Anviles 1 hamer two hursts cont 2 tonne 1 hundred	6 09 10
8 paire of litle tongs, six paire of great tongs, foure furgonnes, two great	
ringers, one litle ringer	2 00 00
Three plates of Cast Iron	0 18 00
The lease of Pilbeames forge	20 00 00

At the furneyes in Chiddingstone

<i>Imprimis 26 sowes & 2 pigges cont 20 tonnes 4 hundred at £3 the tonne</i>	60 12 00
An Anvile and a hamer cont ½ tonne	1 10 00
57 gonne hedds cont 4 tonne at 33s 4d ye tonne	6 13 04
<i>Two broken gonnes cont one tonne</i> ½ <i>at 53s 4d the tonne</i>	$4\ 00\ 00$
In the cole heape 715 lodes, at 13s 4d the lode	476 13 04
Forty lodes of coles at Croswells & Walters the carienge & colinge	
deducted evry lode at 10s	20 00 00
10 lodes of coles at Nisells hothe the coling & carienge deducted at 8s the	e lode
	$4\ 00\ 00$
1200 lodes of myne at 2s 6d the lode	150 00 00

Of particular interest is the presence of a sizeable quantity of gun heads and two broken guns. Gun heads, the extraneous part of the cast cannon that were intended to absorb the impurities and gas bubbles that floated to the top of the casting, were cut off and normally dispatched to a forge for the finer and hammerman to work up into bar iron. Thomas Browne had moved to Ashurst Furnace, which was much nearer to Pilbeams than Chiddingstone Furnace, so it is probable that Streatfeild was purchasing gun heads and broken guns for his forge from there. Another interesting feature is the mention of "blome iron" which might be interpreted as iron that had been worked up in the finery but had not yet been taken to the chafery for forging into bars. However, the quantity involved, 21½ tons, is considerable and must imply a market for iron in that state. The slitting mill that opened at Dartford in 1590 might be a candidate.

John Tufton, Hothfield, 1664

The inventory of John Tufton, second Earl of Thanet, includes items from two ironworks, the furnace at Ewhurst in east Sussex and the forge near where he lived at Hothfield in Kent; the latter was identified in 2013.⁴⁵

At Ewhurst Furnace & thereabouts

1 paire of bellowes and severall other Tooles, as by a particular doth appeare amounts to 20 00 00

One the Green next the Furnace	
12 peeces of Tymber some great some small	0 14 00
6 Colewaynes and 3 bottomes of Colewaynes	2.00.00
245 Tonns of Sowes £4 10s per Tonne is	1102 10 00
9 Tonns of Castware £5 10s per Tonne	49 10 00
At the Hammer Forge	
3 prs of Bellowes	5 00 00
22 cwt of Iron Castware	4 00 00
A forge Anvill	0 10 00
10 prs of working Iron Tongs	1 00 00
6 Iron Ringers, 2 Iron Turne Sowes, 3 Iron Tweres and ot	her working tooles 1.10.00
1 Hamer beame lying in ye pond	3 00 00
7 waynes & 2 Tumbrolls	2 00 00
40 load of Charcoal	40 00 00
6 Load at Warrhorne ⁴⁶	5 00 00
420 Cord wood at severall plases	126 00 00
Beames, Scales & weights	2 00 00
180 Tonnes of Barr Iron at the hamer Clutterye & Westw	vell at £12 per Tonne
	2160 00 00
1 Tonne of Iron at London	10 00 00
[debtors]	
Mr Barratts Bond for Iron	750 00 00
Mr Simpsons Bond for Iron	300 00 00
Georg Winterton for Iron	17 00 00

45. KHLC, U455/E1. Some of the items from the inventory were included by Tony Singleton in *Wealden Iron*, 2nd ser., **33** (2013), 33.

46. Warehorne; east of Tenterden, on the way, though indirectly, between Ewhurst Furnace and Hothfield Forge.

Robert Beehalls bond for Iron	28 05 00
Gregory Sayres bond for Iron	25 10 00
Richard Wood bond for Iron	12 15 00
John Missing for Iron	8 10 00
Mr Marchants bond for Iron beeing desperate	3050 00 00
The Executors of Thomas Taylor deceased, one bond	20 00 00
Mr King one a bill	30 00 00
Sir Nathaniell Powell Interest of £800 due Feb 1663 last	48 00 00

The furnace at Ewhurst had been thought to have been part of the manor of Bodiam when it was purchased by Sir Nicholas Tufton in 1623. Four or five years later he had instructed the clerk of his ironworks to deliver cinder to surface the local roads.⁴⁷ Tufton was later ennobled and his son, John, as second Earl of Thanet, inherited the works from him in 1631. He sold the manor to Sir Nathaniel Powell in 1645 and it is stated by Gardiner and Whittick that Tufton and Powell had been in partnership at Northiam Furnace, half a mile away, in 1636.⁴⁸ No accounts of production at Ewhurst Furnace appear to have survived until this inventory more than 30 years later in which, significantly, 245 tons of sows and nine tons of cast ware are recorded there belonging to Tufton.

The survival of Ewhurst and Northiam furnaces in the lists, now lost, of about 1667 is confused by the two transcriptions made of them: Lower's which only included the ironworks in Sussex; and Parsons', which included the ironworks in Kent and Surrey as well.⁴⁹ Lower listed furnaces at Ewhurst and at Northiam, transcribing the latter as *Norsham*, both operating in 1653 but discontinued before 1664 and both annotated on the original document with an *m* to indicate that they made guns or shot in the late wars (i.e. the Dutch Wars) for supply of the king's stores. Parsons transcribed them as "*m* Ewhurst at *Norjam*", implying that there was only one furnace at that time and that, in effect, the furnace in Northiam was called Ewhurst Furnace. Field evidence confirms that there were two furnaces, in close proximity and

47. East Sussex Record Office, RYE 47/109/23.

^{48.} M. Gardiner and C. Whittick, *Accounts and records of the Manor of Mote in Iden 1442-1551, 1673* (Lewes, Sussex Record Society **92**, 2008), lv.

^{49.} M. A. Lower, 'Sussex iron works and iron masters', *SxAC*, **18** (1866), 15; J. L. Parsons, 'The Sussex ironworks', *SxAC*, **32**, 21.

with the parish boundary between them.

While there is a lack of evidence of the operation of Ewhurst Furnace it is known that Nathaniel Powell at Northiam had been producing sows in the 1640s.⁵⁰ Thus, the 245 tons of sows listed at Ewhurst in John Tufton's inventory, which probably represent in excess of 500 sows, are difficult to explain. Sir Nathaniel Powell's inventory, of 1675, makes no mention of ironworks.

David Carricke, Ticehurst, 1680

Finally an inventory that, it was hoped, might yield some interesting items but failed to do so. David Carricke died in 1680. He was described in both his will and his inventory as a gun noweller, a term that this writer had not seen used before. Nowell bars are noted above in the inventory of Edward Herbert (*see* note 14), but at which gun-founding furnace Carricke's specialised skills had been employed his inventory gives no clues, it consisting of just a few domestic items.⁵¹

50. ESRO, SAS/CO 1/405.

^{51.} TNA, PROB 11/363/588, probate 7 Sep 1680; PROB 4/21022, 30 Sep 1680.

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