



Newsletter 75 Spring 2022

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In this issue:

P.2 Tools of the Trade in Saxon and Viking Times

P.4 Historic England Archaeological Map

P.4 WIRG at the Historical Metallurgy Conference

P.5 Open Access to *Historical Metallurgy* Journal

P.5 A forge Hammer and Anvil

P.6 Recent Publication: A. Margetts, *'Medieval and later Wealden iron workings at Ifield Forge and Mill, Crawley, West Sussex'*

P.7 Pippingford Smelt Days

P.8 Some interesting etchings

P. 9 Mediaeval Bloomeries

P. 10 Wealden firebacks at the Victoria and Albert Museum

P.12 Great Park Wood excavation

P.12 Dorothy Hatswell

Iron and imagery from Nordic England

Gerry Crawshaw's contribution (pages 2 and the following pages) concerns some epigraphic and literary evidence for the tools and iron working in early mediaeval Britain. It also contributes to our ongoing discussion of the intellectual and ideological context within which bloomery iron production occurred.

There are questions which arise in this discussion:

- What did ironworkers believe they were doing when they smelted ore with charcoal to produce iron?
- Was this belief (or beliefs) lodged within a more general system (no good English word for this, but was it part of their *weltanschauung*) or was it, as it were, a free-standing belief?
- Was ironmaking an hermetic theory and practice, or were ironmakers' thoughts and actions well understood by their customers?
- How widespread was any particular understanding of ironmaking?

We have a reasonable understanding of belief systems within African ironmaking traditions: these systems are much more recent than their Northern counterparts. What can we expect to learn about the latter?

Gerry summarises the tale of Sigurd. There are echoes of the story of Sigurd and the knowledge licked from his burned fingers in the (Irish) story of Fionn MacCumhaill (aka Finn McCool) licking his fingers whilst cooking the Salmon of Knowledge. Can any reader find links between the corpus of early Irish stories and their ironworkers? I think it may be significant that the Irish, English and Norse words for iron are essentially the same, but different to the words for iron in Latinate languages.

The Halton Cross locates ironmaking within the beliefs and religious practices of Norse people in England on the cusp of their transition to Christianity.

J Prus

Tools of the Trade in Saxon and Viking Times

There are few descriptions of iron-working or smithing in Saxon or Viking times, yet here in England at Halton, Lancashire, are some stone carvings made in that era depicting an iron forge, a smith and his tools.



picting an iron forge, a smith and his tools.

In the churchyard of St Wilfred, the Halton Cross Shaft may be seen - a cross reconstructed from four different stones in 1890-91.

The four base sides are part of the original cross dating from around 900 AD. Two sides of this lower part describe elements from the legendary Saga of the Volsungs, a re-telling of old Norse stories dating back to the fifth century and known to us from thirteenth century poetry.

A summary of part of the saga is helpful, to understand the story on the stone.

The famous sword 'Gram' , placed into the trunk of a tree growing through King Volsung's hall by Odin, can only be removed by Sigmund (Volsung's son). During his last battle, the dying Sigmund's sword is broken into two pieces by Odin.

Hjordis, Sigmund's wife, saves the two halves of the blade to keep for their unborn son, Sigurd.

From his early years, Sigurd is fostered and tutored by Regin, a skilled worker of iron in the royal court of Denmark. When Sigurd reaches manhood, Regin tells him about his own two brothers : Otr, killed by some of the Norse deities and Fafnir who acquired the gold of Andvari the dwarf, took the hoard and turned into an evil dragon.

Regin's plan is for Sigurd to kill his brother Fafnir allowing Sigurd to keep all the treasure. The smith makes two swords for Sigurd, which break when the young man tests them, so Sigurd then returns with the two pieces of 'Gram', his father's broken sword. Regin reforges these into a mighty weapon once more.

When Sigurd reaches Fafnir's lair, he digs and hides in a pit, then stabs the dragon through the heart as it crawls over the hole.

Regin, hiding nearby, asks Sigurd to roast Fafnir's heart for him to eat. Testing the heart to see if it is cooked, Sigurd

licks blood from his finger and finds he can miraculously understand the speech of birds. He hears some nuthatches say that Regin plans to kill him and keep the gold for himself.

Thereupon, Sigurd turns and kills Regin, carrying off as much treasure as he can carry on Grani, the special horse given to him by Odin.

These two sides of the cross then, illustrate excerpts from this story of Sigurd and the Dragon and for this reason it is known as the Sigurd Cross.

On side one, the large base panel depicts Regin the blacksmith seated with hammer in hand at his forge, repairing the sword. Many of his tools are shown and two sizes of bellows at the bottom of the furnace.

Above is the image of a headless Regin after Sigurd has killed him.

Another panel shows Fafnir's heart being cooked by Sigurd (sucking his fingers), with intertwined trees above where birds sit warning of Regin's intention to kill him.

The second side has carved motifs of Fafnir as a dragon and the horse, Grani.

The third and fourth sides have Viking and Christian symbols carved by the same sculptor as the Sigurd story panels. As the Vikings turned to Christianity, it was not uncommon to mix pagan and Christian motifs.

To those interested in early ironworking, the depictions of Regin in his forge with his tools are fascinating, being drawn from genuine examples of smithing in Saxon and Viking times.

Other examples of the Sigurd Story are found in Britain; at York Minster, Kirby Hall Harrogate, Ripon Cathedral and the Maughold Stone on the Isle of Man (which shows smithing tools used to reforge Gram the sword).



Continued on Page 4

The Halton Cross however, has the most complete representation of the story of Sigurd the Dragon Slayer outside Scandinavia.

Gerry Crawshaw

Further Reading: The Corpus of Anglo Saxon Stone Sculpture, vol 9, Cheshire and Lancashire. chaklepie.com

Historic England Archaeological Map

Historic England have recently published an 'Aerial' Archaeological Mapping Explorer site of England at

<https://historicengland.maps.arcgis.com/apps/webappviewer/index.html?id=d45dabecef5541f18255e12e5cd5f85a>

It shows recorded sites and their boundaries. Clicking on a site provides a summary of the record with links to further information. 'Aerial' is rather misleading as there does not seem to be any direct links to aerial photographs of the sites included. Normally, the 'Britain from Above' web site <https://www.historicenvironment.scot/archives-and-research/archives-and-collections/britain-from-above/> would hold these but presently it is down for maintenance. Alternatives are the National Library of Scotland www.nls.uk which includes LIDAR and historic maps or of course, Google Earth which is also included in the mapping feature on the WIRG database of sites.

WIRG at the Historical Metallurgy Conference

WIRG is participating at the twice postponed (due to Covid) Historical Metallurgy Conference '*Accidental and Experimental Archaeometallurgy*', with the building of a bloomery furnace followed by a smelt.

This will take place at the Ancient Technology Centre, Cranborne, Dorset, on 10 to 12 June.

Due to the short period available to build the furnace, we are prefabricating the bottom half of the furnace at Pippingford. To achieve this, we are preparing clay blocks with a plan profile of a truncated triangle which will be 'cemented' together with clay at Cranborne. Each block weighs in at 9kg and is formed in a mould, the clay being compressed with a screw jack to ensure good strength. Grog (burnt clay from the previous demolished furnace) and chopped hay are mixed with crushed raw clay to prepare the mix.

Should anyone be in the Cranborne area on Sunday 12 June you are welcome to come along from 1 to 3pm to watch our smelt and the activities of the seven other 'Experimenters' which are conducting a variety of other demonstrations – including bronze lost wax casting and blacksmithing.

The location of the Ancient Technology Centre is, Damerham Toad, Cranborne, Dorset, BH21 5RP.

Better still, come and attend the whole conference which includes 9 papers on the Saturday for which registration is required and a fee payable. <https://historicalmetallurgy.org/current-events/agm2022/>

Tim Smith



Open Access to *Historical Metallurgy* Journal

The Council of the Historical Metallurgy Society is pleased to announce that *Historical Metallurgy* has become 'Platinum Open Access'. The content is freely accessible to all at <https://hmsjournal.org> and the journal remains free for authors to publish in - there are no Article Processing Charges! All new content will appear online as it is published, and all back-copies will eventually be available. Currently the digitisation process extends back to 1988 and the remainder will follow soon. A quick search of the back index which dates back to 1966 reveals a number of papers related to the Weald – unfortunately most pre-dating the current digital upload, but these will be scanned and added providing a searchable document over the next year or so. These earlier papers are available as image-pdfs and can now be downloaded, free of charge, from the HMS shop.

For those with wider interest in Industrial archaeology each issue contains five or six main articles relating to world-wide sites, plus a number of book reviews. The journal publishes twice a year.

HMS' bold decision to go Platinum Open Access means that, unlike most Open Access academic journals, there are no authors' fees as an income stream. But, HMS believe it is essential, particularly in the field of industrial archaeology, to continue to encourage the free publication of good quality research undertaken without large-scale external funding. Instead of authors' fees, HMS is reliant on membership fees for the financial security of the society and of the journal. Effectively, HMS are asking the historical metallurgy community to crowd-fund this exciting service through becoming and remaining members (for membership options see <https://historicalmetallurgy.org/join-or-renew/>).

The Society's newsletter *The Crucible* is also freely available via the Society's website at <https://historicalmetallurgy.org/publications/hms-newsletter/>.

Tim Smith

A forge Hammer and Anvil

A propos of my article in last year's WIRG Bulletin about the hammers and anvils supplied to Rievaulx Forge in Yorkshire from Robertsbridge Furnace, this photograph came into my hands recently. This hammer and anvil, no different to those cast at Robertsbridge more than a century earlier, were photographed at Nethy Bridge in the Scottish Highlands where, as Peter King in his *Gazetteer of the British Iron Industry* (2020) has noted, a forge and furnace were in operation for a few years in the 1730s, the forge apparently having two



fineries, possibly two chaferies and two hammers. My thanks to Roderick Butler for the photograph.

Jeremy Hodgkinson

Recent Publication

A. Margetts, 'Medieval and later Wealden iron workings at Ifield Forge and Mill, Crawley, West Sussex', *Sussex Archaeological Collections*, **158** (2020), 121-145.

In 2014 work being carried for West Sussex County Council to improve the outflow from Ifield Mill Pond necessitated the temporary draining of the pond and a watching brief by Archaeology South-East. Several features relating to iron-working came to light.

The first of these were the remains of possibly two bloomery furnaces in the exposed bed of the pond, one built into the top of the other. The lower of the two was a pit filled with slag and iron oxide pellets, charcoal samples producing radiocarbon dates of the late-12th to 13th century. Overlying the first pit were remains that comprised a heat-affected depression containing a mass of slag, probably from the last firing, and a tapping area. Archaeomagnetic dating of this



Ifield Pond Mediaeval Bloomery

second furnace produced two possible results because of an overlap in the geomagnetic curve: late-13th century or 15th to mid-16th century. The former date seems more likely given the improbability of a second furnace being deliberately constructed in the remains of one built more than a century and a half before.

The principal discovery of the watching brief were the remains of Ifield Forge. It might reasonably have been assumed that these had lain beneath the later corn mill, but in fact they were found some 70m further to the west. Due to the extent of the new spillway the area that



The wheel pit

could be excavated was limited and therefore the entire footprint of the forge building could not be exposed. However, enough was revealed to locate one of the wheel pits in which was found remains of two water wheels, together with slag and fragments of wrought iron bars, all in a silty matrix and consistent with being deliberately dumped. It was possible to estimate the inner diameter of one of the water wheels at about 1.8m (6ft) but the remains of the other wheel were too insubstantial for

a comparable estimate to be made. Ifield Forge, together with Bewbush Furnace and the forges in St Leonards Forest were said to have been put out of use by a detachment of troops sent by Colonel Sir William Waller after the siege of Arundel in 1643.

At most a width of about 4m of the footprint of the forge



Ifield Forge anvil base

building could be investigated east of the wheel pit, other excavated examples, at Ardingly, Chingley and Blackwater Green, indicating a typical width of about 10m, so inevitably it was only possible to identify some of the principal structures. A substantial block of timber sunk into the ground, measuring 0.7m by 0.6m and nearly 1m deep, was identified as the block on which the anvil would have been placed and this suggested the area where the hammer had been located. Adjacent to that an area of heat-affected clay together with hammerscale and slag, and post holes suggesting a timber screen, was interpreted as the site of the chafery hearth.

Of particular interest was the discovery of the remains of a timber sluice south of the site of the forge that would have controlled flow into a wooden pipe used to lower the water level in the pond. Among the surviving timbers of the sluice was a wooden tampion or plug that would fit into the end of the wooden pipe. A second example of a tampion and pipe was found in the pond bay adjacent to the later corn mill.

The condition in which the four forges that have been excavated in the Weald have been found has been generally poor, with Ardingly converted to a fulling mill, Blackwater Green having only two wheel pits and an anvil base,

Pippingford Smelt Days

Smelts at the WIRG Experimental furnace are generally planned for the first Saturday of the month May to October except May, when it will be 14th, June - when we have the HMS event 10th-12th, and July when the smelt will be on 9th as WIRG Summer meeting is first Saturday, 2nd July. The second Saturday each month is kept clear as standby if weather is bad on first Saturday. Always check with Tim on 01403 710148 on the Friday evening if the forecast is bad.

In summary, Pippingford smelts are planned for 14 May, 9 July, 6 Aug, 4 Sept & 8 Oct.

All WIRG Members welcome. Contact secretary@wealdeniron.org.uk if directions required.

Preparation work for the HMS Cranborne event will take place on Sat 9th, Fri 15th & Fri 29 April and 6th, & 14 May if required. Check with Tim first. Loading of kit for HMS will be on Thu 9 June. If anyone is available on Monday 13 June to help unload equipment please come to the Pippingford furnace for 10am.

Tim Smith

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Hon Sec

Some interesting etchings

One of our Members, Victor Kellet, happened on these pictures displayed in the window of a picture framing shop in Cranbrook some years ago. A friend took the photographs.

Dated 1802, and drawn and engraved by one W H Pyne, according to the inscription on one of the pictures, two of the pictures depict a cupola furnace being used to cast shot. Such furnaces gain their name from the fact that the earlier furnaces were constructed of iron staves held together by iron rings, like a barrel. They could be dismantled and carried to a battlefield where they were used to melt balls fired by the enemy and recast these into new balls of the required calibre, to fire back to the offenders. Could this be the origin of the saying '*getting your own back*'?



The picture evidently depicts a permanent furnace located in a foundry. It would be charged with coke, iron scrap and limestone, set alight and air blown in, in this case, by a bellows. There is evidently some artistic licence here as there is no indication as to how the crank operating the bellows was driven or how the top board of the bellows was fixed. The weights shown would have been used to weigh down the two halves of the iron moulds for the balls. The man with the hammer is evidently breaking off the feeder to a ball.

The second picture of a cupola shows the tapping hole



and men ladling metal into moulds for balls.

Pictures 3 & 4 show a large hearth. From the tools shown, this is evidently a Blacksmith's hearth rather than a refining hearth. Metal is being heated to near white heat and forged and welded to the required shape by hammering. Here the bellows are operated by a man who raises and lowers the top board of the bellows.



Tim Smith

And an editorial comment...

There is nothing obvious to connect these illustrations with the Weald, but within Pyne's lifetime iron smelting in the Weald ceased and cupola furnaces (which can operate on a very small scale) became common in the urban areas of Kent, Sussex and Surrey.

Since this is, essentially, a re-cycling technology it would be a useful adjunct to a smelting industry, dealing, perhaps, with failed castings. What evidence is there, if any, that cupola furnaces were contemporaneous with charcoal blast furnaces? Your answers please...

Mediaeval Bloomeries

A quick count reveals that there are 203 dated bloomery sites recorded on the WIRG Sites Database - www.wirgdata.org - of which 161 (79%) are from the Iron Age and Roman periods, and 39 (19%) from the Middle Ages. So, statistically, fieldworkers are much more likely to discover Iron Age or Romano-British sites than medieval ones. Yet when it comes to knowing what a bloomery actually looks like, and how it might have operated, the evidence is skewed very much in the direction of the earlier sites. The remains of no less than 31 IA and R-B furnaces have been discovered, some of course in a better state of preservation than others, but a significant number providing archaeologists with a good understanding of their form and use. Only four medieval bloomery furnaces have been excavated and none was in a condition that allowed much to be learned about their construction or operation.

We are beginning to find out more about where iron was being smelted in the Weald in the Middle Ages. Excavations in Crawley over the last few decades have revealed that this medieval settlement, that was first granted a market at the beginning of the 13th Century, must have been a major production centre, and the research currently being undertaken by Jack Cranfield, whose studentship WIRG has co-sponsored, is expected to tell us more about operations at the medieval sites at Roffey and at Tudeley. But this must only be a small part of the picture. Cleere & Crossley, in *The Iron Industry of the Weald* (1985/1995, p. 88)) have shown that in the 13th and 14th centuries at least 70,000 horse-shoes and nearly 200,000 nails were purchased by the Crown from Wealden producers, as well as raw blooms and other ironwork. Where were such prodigious quantities coming from? It should be a major focus of research to discover where the centres of production were, but also WIRG could investigate more thoroughly the medieval sites we have already located to unearth the remains that could inform us about the bloomery furnaces that the medieval iron-makers employed.

Iron Age and Romano-British sites are, quite frankly, 'two-a-

penny' and their characteristic and often abundant slag make them relatively easy to find and attractive to excavate. On the basis of the statistics I gave above we can confidently expect that as many as 80% of the undated bloomery sites in the Weald are from the Iron Age and Roman period as well, so excavation of more of them is unlikely to tell us much we don't already know.

Therefore we need to be more disciplined and go after the sites that present more of a challenge - the medieval ones. There are some potential areas for investigation. We know that the minepits at Sharpthorne brickworks, near West Hoathly, were dug in the Middle Ages, and a bloomery site at nearby Courtlands Farm has yielded medieval pottery; there are other, as yet undated, sites in the immediate vicinity that could be associated. Back in 1975 Fred Tebbutt published a paper in the *Sussex Archaeological Collections* on a medieval industrial area WIRG had identified at Parrock, in Upper Hartfield, identifying several potential sites of interest, and when the area was revisited in the early-1990s bloomeries in Ave Maria Wood and Paternoster Wood were noted as worth further investigation. The 13th century iron mine at Lavertye, in what is now Forest Row parish, lies between West Hoathly and Hartfield, and is the subject of some current documentary research. There are medieval sites noted nearby at Brambletye. While further investigations in Crawley rely on rescue archaeology in advance of building development, the three contiguous areas south of East Grinstead perhaps offer the best chance of discovering something new about iron production in the Middle Ages, and it is a research project that WIRG should embrace.

Jeremy Hodgkinson

Please refer to the map at the top of page 10 (overleaf) showing medieval (red) and undated (black) bloomery sites in West Hoathly, Forest Row and Hartfield parishes.



Map showing medieval (red) and undated (black) bloomery sites in West Hoathly, Forest Row and Hartfield parishes.

Wealden firebacks at the Victoria and Albert Museum

One of the great advantages I have enjoyed over previous students of the iron fireback is the internet, for not only have I been able to access, without leaving my desk, a wide range of primary sources and catalogues of forthcoming auction sales, but also the increasing number of museums which have put their collections online. In the space of less than 20 years I have been able to accumulate images of more firebacks than my predecessors would have been able to examine in a lifetime. And this has enabled me to compare over 1000 examples and to recognize groups and series of firebacks that would have been impossible were I limited to viewing a small number of collections in person. It has also made it possible for me to challenge some of the interpretations made by writers in the past.

In 1939 Laurence Faraday wrote an illustrated article for the (sorely missed) *Sussex County Magazine* on 'Sussex Firebacks in the Victoria and Albert Museum', and I am happy to report that I agree with pretty well all he wrote. I mention his article, however, because recently I was invited by Angus Patterson, Senior Curator of Metalwork, to update the descriptions of the firebacks held in the collection of the museum and which are available to view via its online collection database. The museum has 64

firebacks, one of the largest collections in the country, though only a selection is on permanent display. Most are in the Metalwork Gallery but a few are dispersed in other themed galleries at South Kensington, and one or two are on loan elsewhere. The rest are in store. Several years ago, when a larger number were on display I took photographs of all of them and many of the pictures I took have now been used online, updating images that the museum held and which had been taken many decades ago. The first fireback accessioned was in 1892 and examples have been added to the collection over the decades since then, though the greatest number were added before 1930.

Not surprisingly, many of the firebacks in the V&A originated in the Weald, the iron industry in the region being at its height when the greatest number of them were being produced. One of particular interest to me is shown in Fig.1. To start with, it has an unusual shape. In addition it has two



Fig. 1 Fireback, cast iron with circular medallions, made in England, probably 1550-1600 (Victoria & Albert Museum; photo: author).

inverted V-shapes formed from lengths of twisted rope, which are an apotropaic symbol representing the initials of *Virgo Virginum* - Virgin of Virgins - intended to protect the hearth from evil influences (the fireback featured in an exhibition on superstitions at the Ashmolean Museum, Oxford, in 2018). Finally, there are three stamps of a circular design which may have been formed from wafer moulds. That same wafer mould stamp features on a 1642 fireback I acquired last year (Fig. 2) that has associations with the Pelham family. It is therefore likely that these two backs were made at the same ironworks, which might have been the



Fig. 2 Fireback of 1642 with various stamps (author's collection).

Pelham's furnace at Waldron.

Another fireback with an intriguing past is shown in Fig. 3. It bears the inscription, 'THES IS FOR WILAM BRON AND ELISABTH HIS SISTR' and is dated 1582. Who they were I have no idea. Bequeathed to the V&A in 1926, for a long time the label next to this fireback stated that it was probably associated with the Roos family of Helmsley in Yorkshire and therefore likely to have been made in that county. This attribution was based on the three water bougets that feature in the fireback's top arch; they are a heraldic charge which are on the family's arms. However, other features of this fireback - the date and the initials 'IA' - place it in a group, the other members of which all have Wealden con-



Fig. 3 Fireback dated 1582 with inscription and initials IA (Victoria & Albert Museum; photo: author).

nections. And water bougets are also on the arms of the Roos or de Ros family of Easebourne, near Midhurst, and the Meeres family of Glynleigh, near Hailsham.

Both of the previous firebacks in the museum are unique castings. Not so with the third one (Fig. 4), copies of which are in several museums. This was the first back acquired



Fig. 4 Fireback with a coat-of-arms, ca. 1650, possibly those of John Trevor (d. 1686) (Victoria & Albert Museum; photo: author).

Continued overleaf

by the V&A. The old label next to it in the Metalwork Gallery stated that the arms on its surface were probably those of Colonel Mark Trevor, Viscount Dungannon. However, the rules of heraldry dictate that the shield of a viscount would be entitled to supporters, and a helmet of a different form. Instead the arms are probably those of another member of the Trevor family, John, who married Elizabeth Morley and thus came into the possession of Glynde Place.

To view the V&A's revised online catalogue of firebacks go to https://collections.vam.ac.uk/search/?q=Fireback&page=1&page_size=15&id_category=THES48920

Jeremy Hodgkinson

DOROTHY HATSWELL

1934-2022

Longer-standing members will fondly remember the buffet lunches and teas that Dorothy Hatswell prepared for the Group's summer and winter meetings back in the late-1980s and 90s. Dorothy was someone who was always prepared to get involved and to organise something when no-one else would or could. She was a member of the WIRG Committee from 1985 to 1999, and for one issue edited the Newsletter (because nobody else could be found to do it at that time). This was merely an extension of her life in general which saw her train as a mature student to be a teacher, sit on committees of sports clubs, chair the association to build a community centre, be elected to the local parish and district councils, and be voluntary curator of East Grinstead Museum, before becoming a Trustee for the last 16 years.

Great Park Wood excavation

As we commence the fifth year of excavations, two of which were disrupted by covid, an update on progress and our plans for 2022.

The site was discovered in 2015 when a foray found a stream, emerging from a nearby spring, eroding a slag heap. The slag heap showed no signs of having been robbed despite its location about 250m from a former ridgeway and toll road. The slag heap appeared to be covered by a 30cm thick layer of soil/leaf mould and this made it straightforward, or so we thought, to locate its extent. We therefore dug trial pits to depths of 60cm in a gap between trees upslope of the edge of the slag heap. These revealed no evidence of iron working, just what we believed was the natural soil. We decided to dig downslope of the trial pits close to the edge of the slag heap in the expectation that this could be the working area of a bloomery or bloomeries.

It soon became obvious from trench 1 that hillwash exceeding 1m in depth covered the area in which we had expected to find the working area. Under the hillwash trench 1 revealed slag, lumps of raw ore, and a quantity of roasted ore. More encouragingly the trench has provided

many sherds of pottery which have been dated to the 1st and 2nd centuries AD. This makes the site contemporaneous with the major industrial site at Chitcombe which is about four miles to the west.

A second trench located about 15m to the north from the first, but still within the wood, a location mainly determined by the absence of trees, has revealed iron working features at a depth of over 1m. They have yet to be explored, ore roasting and/or furnace bases are possible.

In 2021 we asked the Hastings Area Archaeological Research Group to conduct a magnetometry survey of the fields lying immediately outside the wood to the north and west. The survey identified two areas in which the remains of industrial processes were indicated. Limited probing and auguring has recovered pieces of slag from depths of over 1m. These areas of slag are upslope and some 20m from the nearest edge of the slag heap in the wood. This raises the possibility that we have found evidence of two separate phases of iron working. Further magnetometry surveys are planned for 2022 and we are considering other ground survey techniques. Our aim is to gain as much knowledge about the site as is possible without extensive deep excavations.