Newsletter 84 Autumn 2026

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Notice of Winter Meeting 2027

Saturday 23 January 2027

at

Nutley Memorial Hall, Nutley TN22 3NE

2-30 to 5pm

A Talk by David Rudling,

Director of Sussex Archaeology & History,

on

ROMAN ROADS IN THE WEALD

Tea and cakes will be available after the talk

Further details and directions on the WIRG website

EDITORIAL

This issue of the WIRG Newsletter comprises a mere six pages, almost half of its usual size, and it is down to a lack of contributions. If the Newsletter is to continue to be published each Spring and Autumn, more members will need to send the editor items of interest. These can include, but are not limited to, descriptions of sites visited, examples of Wealden iron seen, queries, suggestions and comments.

LITTLE FURNACE WOOD

Long-standing members will remember the excavations that took place in Little Furnace Wood, off Newick Lane south of Mayfield. WIRG and the Mid-Sussex Field Archaeology Team dug the Romano-British bloomery site there between 2003 and 2007, with Chris Butler directing. After inordinate delays (among them Covid and the text being mislaid on an editorial computer) the report on the dig has, at last, been published in the Sussex Archaeological Collections, vol. 162.

WIRG members can read the report at https://www.wirgdata.org/files/Butler,%20Little%20Furnace%20Wood,%20SAC162_1.pdf

The site was discovered on a foray in early 2003 and a second foray took place that autumn to dig a couple of test pits to see if datable material, such as pottery, could be found. Instead, one of the pits revealed part of a furnace structure and, after approaching Chris, to see if he would be prepared to direct (WIRG having no proficient archaeologist at that time), it was decided to excavate. The Mid-Sussex team, led by Chris, had carried out several digs on a variety of sites, including discovering the Barcombe Roman villa, so their expertise was



Little Furnace Wood, Furnace 1



Little Furnace Wood, Ore roasting pit

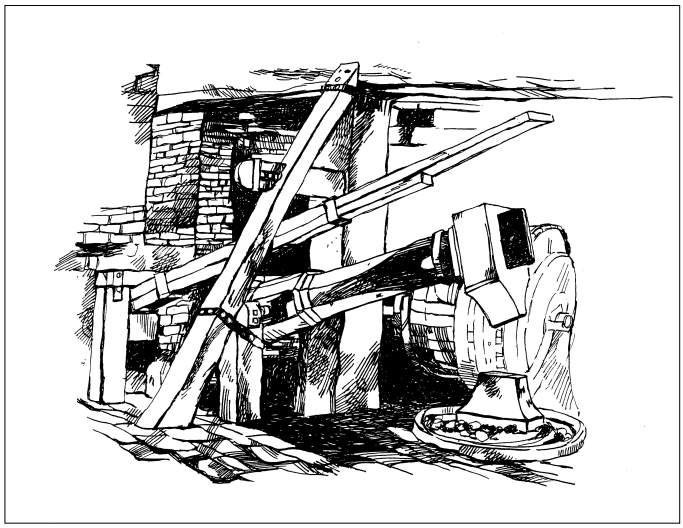
very welcome.

A sizeable amount of slag was spread over the side of a small stream valley, and several badger setts revealed slag and furnace material those creatures had ejected to form their tunnels. Two furnaces were eventually uncovered, of different types, and a well-preserved ore roasting pit. One of the furnaces was significantly larger than any others that had been discovered up to that time (though similar, if even larger, ones were found during subsequent excavations at Upper Wilting Farm, Crowhurst – another site report eagerly anticipated). Radiocarbon and archaeomagnetic dating was employed as well as pottery finds and a thorough metallurgical report was compiled by Dr Tim Young. The last of these can be found by searching for 'Little Furnace Wood' on the WIRG sites database.

WIRG has always sought to publish its discoveries, indeed it is one of its stated charitable aims, so it is gratifying that this report is now available.

A WORKING HELVE HAMMER

Wealden forge hammers, and there were more than 100 of them, were operated by a series of cams on a shaft, rotated directly by a waterwheel, lifting the helve or hammer-beam and dropping the hammer head on an anvil. Some illustrations of this have survived, notably the paintings by Joseph Wright of Derby, but the chance to see such a mechanism in action can be gained from a one-minute video sequence of the late-17th century Häfla Hammermill in southern Sweden, which has been restored to working condition. The film vividly recreates the sound within the working environment of the forges that were an integral part of the post-medieval iron industry in the Weald. Contemporary accounts testify to the noise emanating from them that, in the quieter world



of a few centuries ago, could be heard over a considerable distance.

Click on the link below to access the film clip:

https://www.youtube.com/watch?v=PCrlp_O9-S8

AN EXPERIMENTAL WEALDEN BLAST FURNACE

Some years ago Gerald Baker built a half-scale model blast furnace at the Rural Life Living Museum at Tilford, not far from Farnham. Particularly successful was his waterwheel. The smelting attempts were less successful. This model was based on the drawings by Reg. Houghton which he derived from excavation plans and contemporary records, such as the work of French encyclopaedists in the eighteenth century.

I mean to build a new model furnace, focussing on the smelting, and trying to learn what it is that its takes to make cast iron. Since The Tilford experiment demonstrated that our understanding of the air-blast was probably correct, an electric blower will be used.

The plan is to begin construction in December this year (2026) and the build complete by April 2027. Actual construction will be carried out by a building professional. Nonetheless a good deal of voluntary help will be needed to make this plan work. Details of where this help is needed follow below. First, though, some of the theoretical problems.

Getting molten iron

Setting up a furnace and getting iron to run out is not a problem at small scale. Numerous recent experimenters report (anecdotally) having done so by accident using bloomeries. The first report of a bloomery producing liquid iron of which I am aware is from Percy's Metallurgy, Vol. 2, of 1864 which describes Indian smelters producing "bad iron" by accident. Bad, presumably, because cast iron is virtually impossible to forge. However, merely getting the liquid by accident is not enough, because the accident involved is over-blowing the bloomery and this is not what the Wealden blastfurnacemen did. We have a reasonable idea of the blowing rate, charcoal and ore consumption (published in the WIRG Bulletin) and the due proportions are not too different from those which a scaled-up experimental bloomery would give you. In fact the implied blowing rate is somewhat lower despite the process requiring a higher temperature.

In short, getting molten iron is possible in a scaled model.

Getting the right temperature whilst blowing gently

It is generally understood that a blast furnace must be "blown in" with some caution. This is usually taken to mean that the temperature should be increased slowly to avoid damage from thermal shock. However, there is probably another set of factors in play. The short and stubby shape of early Wealden blast furnaces (sundry images published in the WIRG bulletin) is reflected in the shapes of the few upstanding furnaces belonging to the charcoal blast furnace era. Most of that stubby volume is solid material and this represents a vast heat sink. A small amount of heat will be dissipated from its surfaces. As the mass of the walls heats up, the temperature gradient across the inner surface drops dramatically. The result is an apparent paradox: as the furnace gets hotter, it loses less heat through its walls and the heat generated from burning charcoal to carbon monoxide can be devoted to reducing ore to iron.

Measuring the temperature gradient across the walls will test theory against practice.

Getting the right iron producing chemistry in the hearth

To get closer to authenticity the hearth in which the iron and slag should collect must be the local sandstone. This has been shown to be the material of construction in the archaeological studies of Wealden blast furnaces. This must add at least some of the silicon the ends up in the cast iron. The joints between the sandstone and the bricks used in the rest of the structure will be filled with fireclay.

Wealden ore will be used. This is siderite in a clay matrix. I would be grateful for help and advice in collecting enough for this experiment.

At the moment the intention is to flux the charge with chalk which is readily available. Shelly ironstone would be preferable if it can be found.

Safety

The core structure is visualised as a brick and sandstone core whose parts are fully keyed in. This core provides the strength of the whole stubby shape. The outer parts of this shape are,

in essence, an insulating blanket that maximises thermal efficiency.

No one has yet successfully run such a furnace within living memory but the safety issues are clear enough. One of these is the break-out of liquid metal and slag. For this reason the hearth will be kept small and the extent of its filling limited. For the same reason there will be a sand dam in front of the casting arch.

No one will be allowed on or near the structure whilst it is in operation: in a retreat from authenticity charging will be carried out from a gantry that remains structurally separate from the furnace.

Records

Fortunately temperature records can be made automatically using a multi-port data recorder fed by thermocouples in the structure.

It would be very valuable to have a video record of this experiment: do we have a volunteer to capture and edit the process, including construction?

Manning the first smelt

Running this furnace is expected to take about a fortnight 24/7.

This needs a minimum of two “furnacemen” for the duration. Volunteers please?

LEGACY

WIRG has received a legacy from the estate of the late Dr Judie English, for which we are most grateful. Judie was a long-standing member of the group and sometime Committee member. Her estate is to be shared between a number of organisations. The amount WIRG will receive will not be known until the executors of her will have completed the sale of her properties.

Further details will be given in future Newsletters.

BBC RADIO ‘SECRET SUSSEX’

More than a year ago I went over to Fernhurst to be interviewed, with its owner Robin Barnes, about North Park Furnace by Simon Furber of BBC Radio Sussex. The recording of the interview, part of their Secret Sussex series, was broadcast in June 2026. It can be accessed on the ‘Where to see Wealden iron’ page of the WIRG Website and via this link: https://www.bbc.co.uk/sounds/play/p0nv88ln

JSH

PETER FARNDEN’S DAUGHTERS

The families who owned or managed ironworks in the Weald were a close-knit bunch and it is not surprising that marriage between ironworking families was common. None more so than the family of Peter Farnden of Brickwall in Sedlescombe (Fig. 1). He was the owner of the Conster forge and furnace at Beckley, and the Crowham forge at Westfield. In addition he leased the works at Crowhurst with his brother Richard, and the furnace at Brede. He will have been a wealthy man … and he would have needed to have been for he had a large family. In 1616 he married Mary Waters and she bore



Figure 1: Brickwall, Sedlescombe, East Sussex

him four daughters, Joan, Elizabeth, Mary and

Martha, and three sons, Peter, John and another Peter. All three boys died in childhood. Mary Farnden died in 1630, leaving Peter with his four daughters, the youngest of whom was aged only seven. Two years later Peter married Lucy Godman and fathered seven more daughters, Ann, Sarah, Jane, Lucy, Margaret (who died young), Mary and Ruth. There was a son, Samuel, but he also must have died young for he received no mention in his father's will. His death is not recorded in the Sedlescombe register. So when Peter Farnden died in 1653 his estate was divided between nine daughters, four of whom had already married.

Of those daughters, seven married into families that had iron connections. Joan, the eldest, married Samuel Gott, the son of a London ironmonger. Cambridge educated, he had trained as a lawyer and became a politician, moving to Battle, in Sussex, when he married. The family connection brought their son Peter into the iron business, part owning the ironworks at Beckley and Westfield after the younger Peter Farnden, his grandfather Farnden's nephew, had died, and buying the furnaces at Lamberhurst and Horsmonden from William Benge after the latter's bankruptcy. Peter Gott's son Samuel carried on the family business, which included casting the St Paul's Cathedral railings.

Elizabeth Farnden married twice. Her first husband was Thomas, the son of Robert Dyke, who had interests in ironworks at Brimham, near Pateley Bridge in Yorkshire. Robert's father, another Thomas, of Pembury, had operated Chingley and Horsmonden furnaces, and the forge at Dundle in Frant. Robert's nephew, yet another Thomas, this time of Horam, would own Hodesdale Forge and lease the Stream ironworks in Chiddingly. And Robert's half-brother, William, vicar of Frant, would come to own both Benhall and Dundle Forges. When Elizabeth Dyke's husband died she married Thomas Collins of Burwash, who would inherit Socknersh Furnace in Brightling, which had been built by his great-great-grandfather John Collins in the early-16th century, and which the younger Peter Farnden. Elizabeth's cousin, would lease in 1671.

Keeping it in the family, Elizabeth's younger sister Mary also married into the Dyke family, becoming the wife, in 1640, of another Robert, the surviving son of her brother-in-law, William, the vicar of Frant, mentioned above. Robert would have taken over Benhall and Dundle Forges, but he and Mary's marriage was short-lived, as she died in 1642 and he two years later. They had had a son, William, though, to whom his grandfather, the elder William, would bequeath the two forges.

Martha, the youngest daughter of Peter Farnden's first marriage, married Edward Polhill of Burwash, a clergyman, in 1646 but he had no connection with the iron trade. However, Ann, Peter's eldest daughter from his second marriage, married Richard, the younger son of Edward Payne of East Grinstead, who was the owner of the Bower Forge, to the east of the town.

The second of Peter and Lucy's daughters, Sarah, married Walter Dobell from Streat, near Ditchling, in 1654, the year after her father had died. Walter's father had inherited Bayham Forge, one of the earliest forges in the Weald, dating back to the 1520s. Rather than working it themselves the Dobells leased the forge and for a while it numbered among the works operated by the Browne family of gunfounders. Keeping it in the family again, Walter Dobell's brother, Barnham, a physician, married Sarah Farnden's younger sister, Mary in 1668. The previous Mary Farnden, Peter Farnden's older daughter, who became Mary Dyke, had died more than 20 years earlier. The middle daughter, Lucy, married Robert Fowle at Sedlescombe in 1657. Although the name of Fowle had been

associated with the iron industry in the past, Robert, of Iridge in Salehurst, was described as a gentleman. The youngest daughter was Ruth Farnden and in 1663 she married John Baker of Mayfield, who owned the furnace just to the north of the village, and which was still in operation in the 1690s.

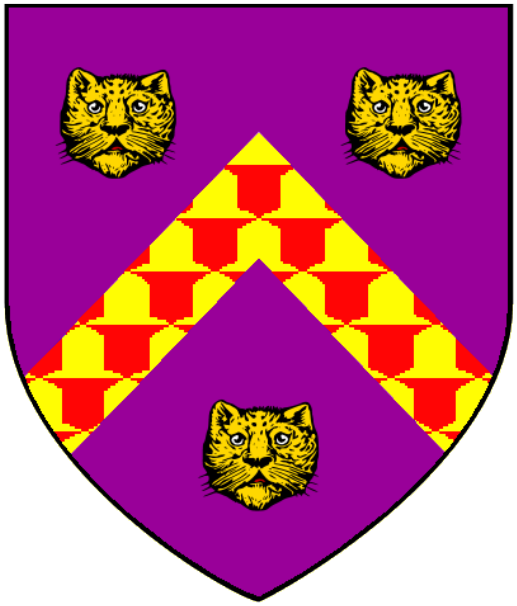


Figure 2: The arms of Peter Farnden



Figure 3: The top part of the memorial to Elizabeth Collins, née Farnden, in Brightling church, East Sussex

Peter Farnden had been granted a coat of arms in 1634 (Fig. 2), and they can be seen 'impaled' with those of her husband Thomas Collins on the gravestone of Elizabeth Farnden in Brightling church (Fig. 3). They are shown 'impaled' because at the time of her marriage she was not an heiress, her baby half-brother Samuel presumably still being alive. After he died all of Peter's daughters became heiresses and the Farnden arms were then entitled to be quartered with those of any armigerous family that the daughters married into. Thus was the case with Ruth. The fireback, right (Fig. 4), which probably dates from the 1740s, shows the arms of Baker – a tower between three keys – quartered with those of Farnden.



Figure 4: Fireback showing the quartered arms of Baker and Farnden; Battle Museum

JSH