

WIRG

Wealden Iron Research Group

NEWSLETTER

No. 11

SPRING 1990

Editor: Mrs. S. Swift, Hamfields, Withyham, Hartfield, Sussex.

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EDITORS'S NOTE

This is the first spring edition of the Newsletter, I hope you will find it interesting. I would like to be able to inform members of iron-related events which they might be interested in attending. If you know of any such events please let me know for inclusion in future editions.

S. Swift

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WINTER MEETING REPORT

About 35 members met in the splendid new hall at Robertsbridge on 10th February for a 'French' afternoon. After welcoming us Jeremy Hodgkinson gave an account of the foray last Easter to the Pays de Bray in northern France, using as illustrations slides taken by various members of the party. Numerous sixteenth century ironworkers came to the Weald from this part of France, as Brian Awty has shown, and the two areas have certain similarities. Many of the iron furnaces were later converted to corn mills, but in the Pays de Bray a greater proportion of these have been preserved and stonework of the original furnace buildings can often be discovered in the standing structure.

Lack of structural remains in the Weald was further emphasised in the talk by Mike Tighe which followed. His illustrations of superbly consolidated and restored charcoal-fired furnaces of eighteenth century date were mainly from around Avallon in Burgundy. In some cases ancillary buildings such as charcoal sheds and workers' cottages are also preserved.

The speakers were thanked by Shiela Broomfield, and the French theme continued with a gourmet's tea laid on a tricolour cloth-
merci beaucoup Mesdames Hatswell et Houghton.

M. Tebbutt

ASHDOWN STUDY GROUP

The Ashdown Study Group has been formed to study the archaeology and history of Ashdown Forest. It intends to study the known archaeological features, fieldwalk and survey them, to fieldwalk

other areas of the Forest and record and survey any unrecorded features. It will also carry out research into the history of the Forest and relate the history and archaeology of Ashdown Forest to other areas of similar character. It will promote a greater understanding of the history and archaeology of the Forest by disseminating this information and by publishing the results of completed work. It will support and advise the Conservators where their work involved the archaeological features on the Forest.

Local knowledge is an essential element in the work to be undertaken by the Group and individuals are invited to join. Active field workers or researchers might like to work on a regular basis, others might be able to draw our attention to features on the Forest or information they have about the Forest without becoming too actively involved.

There is a charge for membership of £3. Meetings have been arranged for the spring of 1990 to visit and extend the area of the survey of Danes Graves. They will take place on 3 March, 7 April, 5 May.

If you are interested in joining the Group please get in touch with Pam Combes, Fairlight, Croft Road, Crowborough, Sussex, TN6 1HA.

LECTURES BY MEMBERS

It is hoped to provide details, in forthcoming Newsletters, of talks being given on aspects of the Wealden iron industry. If you are going to give a talk, or speak at a conference, or you know of a talk programmed to take place, on a subject directly related the interest of the Group, please drop the Editor a line with details of date, time, venue etc., for inclusion in these pages.

Monday 4 June: 'The Wealden Iron Industry', Jeremy Hodgkinson; Pevensey and Westham Historical Society, Westham Village Hall, 7.30 pm.

Tuesday 23 October: 'The post-Roman Wealden Iron Industry', Jeremy Hodgkinson; Mid-Sussex Local History Group, Franklands Village Hall, Haywards Heath, 10.15 am.

IRON FIREBACKS AND IRON GRAVESLABS: A FOOTNOTE

The similarities and even interchangeability in use of firebacks and graveslabs produced by the Wealden iron industry are well known and have been most recently discussed by Miss R.M. Willats in her article on the latter in Sussex Archaeological Collections, vol 125 (1987).

The examples she gives (apart from the Anne Forster series and others at East Grinstead) are associated with the Baker family and their furnace at Hamsell in Rotherfield parish.

A further such example, unknown to Miss Willatts, was recorded by Catherine Pullein in her Rotherfield: The Story of Some Wealden Manors (Tunbridge Wells, 1928). Speaking of Hamsell in her childhood, she says (p. 281):

'The large kitchen held proof that iron grave slabs had also been made at Hamsell Forge; for, behind the log hearth-fire, serving as a fire-back, there was placed one bearing the inscription, "Here lieth the body of John Baker", the date being illegible. ... It must surely have been a slab rejected for some imperfection.'

This seems to imply that the fireback had gone by the time of writing. It is thus hard for us to tell whether it corresponded to any slabs still extant in churches. The only John Baker specimens recorded by Miss Willatts are two infant brothers of 1669 and 1671 at Mayfield.

The usual interpretation of graveslab firebacks is that given by Miss Willatts: pattes made for graveslabs were kept and re-used to decorate firebacks rather than being discarded after only one use. Perhaps, however, Miss Pullein's theory deserves further consideration: that imperfect attempts at graveslabs were used as firebacks. (The alternative, presumably, would be for unsuccessful products to be melted down as scrap.) Certainly all the versions of the Anne Forster slab are not identical, and perhaps not so apt for their purpose as that authentically located in Crowhurst church in Surrey.

M. J. Leppard

THE 'BEAR' AND COMMENTS ON pps 2-4 OF NEWSLETTER 10

A BEAR is a very respectable piece of the operation of a blast furnace. It there is no bear after a furnace has been on blast for a while, then it has not worked.

The technical dictionary definition is:

"BEAR (horse, or salamander - different parts of C.B.)
= A mass of metal found below the hearth level of a blast furnace when it is blown out. Molten metal has penetrated the hearth while the furnace was working. Hearth bricks and slag are usually mixed in the bear".

You will realise that the height of the burden in the furnace - the contents cold and hot and molten - rest, say 95% of its weight, on the hearth bottom, say 5% is supported on the ?. The molten iron is not STILL, it is being churned up by tapping, by slagging off, by the pressure of the air blast. So you have a molten SCOURING action on the hearth surface which erodes it dissolving the brickwork: slag mixed in the iron dissolves

brick and so the hearth bottom level soon becomes a dish, then a bowl then, if the furnace is not taken off blast, it could get out of control and a breakout might occur - THAT is a disaster. Hearths have always been made as strong as possible: hearth stones were usual, solid refr? in place of bricks.

As blast furnace practice improved, COOLING was introduced down the sides of the hearth and in the most sophisticated designs - cooling UNDER the hearth: but a layer of water under the hearth - if penetrated by molten iron - is a potential VIOLENT EXPLOSION. In the last 50 years, AIR COOLING right across under the hearth was used - you could in effect look across under the hearth bottom plate: thermocouples in the hearth brickwork monitor the temperature rise in the brickwork.

There is bound to be a mass of iron/slag/brick between the molten iron and the solid cool layer: and this is the lump which goes solid when the furnace goes off blast and is dragged out as a solid lump in olden days, but cut up with oxygen torches in more recent times, into handlable lumps.

But the last tapping of a furnace before being blown out is driven deep down into the "pool" under the hearth to drain as much molten material off as possible. This tapping is away from, and below, the working taphole and is therefore a destructive operation.

So the bear is a natural product of iron production in a blast furnace.

Operators of blast furnaces would always size the material being charged - mainly ore, limestone, coke/coal/charcoal. FIST size is a reasonable indication. So IF scrap iron was to be charged - not usual - it would be broken up to small size. Large lumps would be impossible to handle and would never be considered. The theory that large lumps would "stop the flow of air", "cause a 'bear' to form", etc. is totally wrong. Small lumps of iron scrap would be OK. They would NOT oxidise because the atmosphere in the furnace stack is REDUCING with a high percentage of CARBON MONOXIDE (Co). So any scrap iron would just MELT - all very good but, as I say, unusual in typical iron ore reduction to iron process.

C. Blick

RECENT PUBLICATIONS

A.F. Harding and J. Ostojca-Zagorski 'Excavations in Rocks Wood, Withyham, 1987' Sussex Archaeological Collections 125 (1987), 11-32. Plans & diagrams + specialist report on the iron smelting furnace by H.F. Cleere.

The report is of an excavation of three rock shelters, in one of which were abundant Mesolithic finds. The chance discovery of a developed-bowl bloomery smelting furnace is of interest to WIRG. The furnace bore features resembling those seen at Cow Park, Pippingford, and Dr. Cleere points out the

European pedigree of such furnaces, the occurrence of which, in Britain, dates from the 1st century BC. He suggests that the location of this furnace in a defensible position may well place it in the late-Iron Age period, although this type is known to have continued in use into the period of the Roman occupation and is, indeed, the most widely encountered form of smelting furnace on excavated early Wealden iron sites.

J.S. Hodgkinson 'Two Roman Shoe Fragments from Sedlescombe' Sussex Archaeological Collections 126 (1988), 231-3.

This note is predominantly the specialist report, by Quita Mould, on the leather found in late 1985 during a Field Group foray to the Iron Age and Romano-British ironworking site at Footlands. It concludes that the fragments found were parts of two shoes of the 1st-3rd centuries AD; dates which are in agreement with the pottery dating of this site.

R.D. Smith and R.R. Brown, 'The Bodiam Mortar' in Journal of the Ordnance Society vol.1 (1989), 3-22.

Bob Smith and Ruth Brown describe the provenance and construction of this unusual piece of artillery which is now in the Rotunda Museum, Woolwich. It was apparently dredged from the moat at Bodiam Castle late in the eighteenth or early in the nineteenth century, finding its way to Woolwich in 1852. It is of curious construction, being of cast iron but cased in banks of wrought iron. It has a calibre of 38cm (15ins.) and barrel which is 56cm (22ins.) long, although the powder chamber, which has a wrought iron inner lining, is 35cm (14ins.) long but only 7.5cm (3ins.) in diameter. The authors conclude that the piece represents an experimental stage in gunfounding, with the wrought iron bands being recognised as necessary because of the brittleness of the cast iron (it is a variety of white cast iron high in manganese). They suggest that it would have been cast muzzle downwards, like a bell, and was, by its very survival, probably never fired. They date it from early in the sixteenth century, with its origin probably in the Weald.

B.G. Awty, 'Parson Levett and English Cannon Founding', Sussex Archaeological Collections 127 (1989), 133-145.

Brian Awty examines the nature and supply of iron guns cast by William Levett, making use of two newly discovered lists of ordnance of the 1550s, and of the inventories of some of the shore fortifications established by Henry VIII. He argues that the weight and calibre of Levett's products increased over a ten year period and that it was his, and his successors', use of the vertical casting method which gave Wealden guns and gunfounding their superiority over continental competitors until the end of the sixteenth century.

What is not explained is why, despite this superiority and their

cheapness compared to bronze, iron cannon continued to be regarded as inferior by the Navy, and more frequently used for land defence and for arming merchant vessels than on the sovereign's principal warships. Given the presence of wrought iron guns on the 'Mary Rose', it cannot only be for reasons of weight.

PUBLICATIONS FOR SALE FROM WIRG ARE AVAILABLE FROM:-

Mr. B.K. Herbert, 1 Stirling Way, East Grinstead, Sussex, RH19 3HG	PRICE	
	BY POST	AT MEETINGS
The Excavation of a Late 16th/Early 17th Century Gun Casting Furnace at Maynards Gate, Crowborough, Sussex 1975-1976. By: D. Bedwin	£0.85	(£0.60)
A Middle Saxon Iron Smelting Site at Millbrook, Ashdown Forest, Sussex. By: C.F. Tebbutt	£0.95	(£0.75)
Wealden Bloomery Iron Smelting Furnaces. Survey of Wealden bloomeries in an area of approx. 200 km. By: C.F. Tebbutt	£0.80	(£0.60)
The Fieldwalkers Guide and an Introduction to the Iron Industries of the Weald. By: B.K. Herbert	£2.95	(£2.50)
The Bewl Valley Ironworks, Kent, 1300-1730. By: D.W. Crossley	£3.25	(£2.50)
The History of Watermills, The Wealden Iron Industry, and Geology of the South-East. Third updated edition. By: C.E. Woodrow, B.K. Herbert & C. Smart	£1.30	(£1.15)
Bulletins of the Wealden Iron Research Group:-		
Volume 1,9,11,13,14,15 & 16	each £0.80	(£0.50)
Volume 1 to 5, new series	each £1.25	(£1.00)
Volume 6 to 9, new series	each £1.75	(£1.50)

VOLUMES 2,3,4,5,6,7,8,10,12,17 ARE OUT OF PRINT
AND WILL NOT BE REPUBLISHED

WIRG has purchased some "remaindered" copies of the book "The Iron Industry of the Weald" by H. Cleere & D.W. Crossley. These books are offered to WIRG members, who can order a copy from:
B.K. Herbert, 1 Stirling Way, East Grinstead, Sussex, RH19 3HG.
Price: £12.00 (by post) £10.00 (at meetings)