WIRG

Wealden Iron Research Group

NEWSLETTER No 5 November 1984

Editor: Mrs M Tebbutt, The Pheasantry, Wych Cross, Forest Row, Sussex.
Secretary: Mrs. S Swift, Hamfields, Withyham, Hartfield, Sussex.
Tel: Groombridge 754

Letter from the Chairman

Dear Fellow Member,

With a somewhat scattered membership, it is inevitable that the Group's corporate activities are going to be limited, except at a local level. Apart from the Field Group, it must be our principal aim to foster interest and provide help for anyone who is making a contribution to our knowledge of the Wealden iron industry. Thus the investigation of the presence of iron slag associated with a quantity of medieval pottery, at Huggetts Farm, High Hurstwood, seemed an appropriate project for our support. However, when it began to be realised that a greater input of money and manpower was needed to bring the project to a conclusion, we hoped that the Garden Hill Group would be able to help with the excavation, and the Sussex Archaeological Society would grant some money for it out of the Margary Fund. It was with a great sense of frustration, therefore, that news was received that the latter body were not prepared to grant for the subsistence of diggers, the main purpose behind the application. Finding diggers who are prepared to commit their time to an excavation is essential for the continuity of a project and, although voluntary help from interested local people is usually available, it is not enough, especially with the exacting standards of modern archaeology. Thus it seems extraordinarily short-sighted for a major, county society not to acknowledge the need for grants for this type of expenditure. I am comforted to hear that some alteration of its policy is being considered.

The project to preserve the remains of Pippingford Blast Furnace is not a straightforward task. The extent of the silt and leaf mould covering the site was not fully realised until recently and, for those who were there, the debris of a mere ten years makes it no surprise that virtually all remnants of the iron industry in the Weald are buried. Because of the state of the site, it will take a while for a specification for the work to be drawn up and estimates to be obtained, but I am most grateful for the help we have received so far. On a more encouraging note we are honoured that Earl de la Warr, Lord Gibson and Professor Jack Nutting, President of the Historical Metallurgy Society, have agreed to be patrons of the project.

One of the highlights of the year, for me, was the publication of a most painstaking piece of individual research, 'The Queen's Gunstonemaker' by Mr. Edmund Teesdale *. As far as I am aware, apart from the publications of learned societies, this is the first book solely about an aspect of the Wealden iron industry to appear since Straker's 'Wealden Iron', more than 50 years ago. It is confidently expected that another will follow shortly!

On a sadder note, Pam Combes, for several years the Treasurer of WIRG, decided to stand down from the Committee this year, to allow time for her many other interests. I should like to take this opportunity to express my particular thanks to Pam for all her hard work for WIRG.

As ever, the Committee and I are always pleased to hear from members, with news of their researches.

My best wishes for Christmas and the New Year,

Sincerely

Jeremy Hodgkinson

* The Queen's Gunstonemaker by Edmund Teesdale price £8.50

Field Group Activities for 1984/85

There was a Field Group meeting held at Huggetts Farm on 9th September 1984 at which members discussed ideas for forays for the coming winter. The following programme of forays and activities was arranged:

29th September - Foray at Horam, in the vicinity of the Merrydown Wine Centre. A Rural Studies Centre is being set up there and WIRG has been offered some space for an exhibition, which could be related to anything found during the foray and the sites already known in the area.

10th November - Foray to Rackwell Ghyll, near Crowhurst. This is a possible water-powered bloomery site.

8th December) - Survey at Hodges Wood, Crowborough. This is to complete the work done last year by surveying the fields adjacent to the wood. This will cover two forays.
12th January)

9th February - Foray to Sharpthorne area to look for and try to date bloomeries. This is to try to find a link between bloomeries and the minepits found at Sharpthorne brickworks.

2nd March - Foray to another area near Sharpthorne to look for bloomeries and to date a slag heap.

13th April - Visit to Verdley Wood and Fernhurst sites in West Sussex to look for bloomeries in the area. Transport by mini-bus will probably be available.

If any member would like to join any of these activities please contact: Mrs. S. Swift, Hamfields, Withyham, Hartfield, Sussex, TN7 4BH.

Ibstock Brickpit, Sharpthorne

As mentioned in Newsletter No 4 1983 a part of a tree trunk came to light in one of the pits during the summer of 1983.

A generous grant from the Margary Research Fund of the Sussex Archaeological Society enabled a piece of this wood to be sent for radio-carbon dating. This gave a date of AD 1120 $\pm$ 80 years. This date is close to that of the previous radio-carbon date of AD 1220 $\pm$ 75 years recorded for a piece of wood from another pit at Sharpthorne. In the last Newsletter the first date was by mistake recorded as AD 1200 $\pm$ 50 rather than AD 1220 $\pm$ 75.

A full account of the pits at Sharpthorne will appear in a forthcoming Bulletin.

G. Swift

Copper Smelting in the Weald

An interesting series of archaeological experiments took place during August 1984 on Roger Adams' experimental bloomery site. Smelting of arsenical copper ore, brought from South America, produced a copper alloy in imitation of metallurgical processes of the pre-Inca period in northern Peru. The American archaeologist, Professor Heather Lechtman, chose the site for her experiments because of its physical suitability and, more importantly, for the expertise of Roger Adams who worked with her throughout. The smelting was entirely successful.

Winter Meeting

On 4th February 1984 more than fifty WIRG members and friends gathered at the King Edward VII Memorial Hall in Groombridge for the Winter Meeting.

After welcoming everyone to the meeting, the Chairman introduced Mr. E.B. Teesdale, a WIRG member, who lives in the Hogge House, Burted and who then gave a most interesting talk about the life of Ralph Hogge, Queen's Gunstonemaker of iron, and other members of the Hogge family.

Ralph Hogge, who was born probably between 1510 - 1515, was an iron master for over forty years, and for sixteen years from 1568/9 held an exclusive licence for gunfounding for export. He owned four furnaces around Maresfield: Langleys, Marshalls, Oldlands, Hendall. Mr. Teesdale had worked out a balance sheet which showed that each furnace probably yielded between £315 - £420 a year.

Mrs. Meades thanked Mr. Teesdale on behalf of everyone for his fascinating and detailed account of the Hogge family, and informed members that Mr. Teesdale's book "The Queen's Gunstonemaker", containing all his research on the Hogge family, would soon be available.

Tea was then served and members had the opportunity to catch up with each other's news.

Conference and AGM, 14th July 1984

St. Mary's Church Hall, Battle, was the venue for our meeting this year, the main theme being the important Roman site at Beauport Park. An illustrated talk by Dr. G. Brodribb on the history and excavation of the site was followed by one from Mr. B. Funnell on other ironworks and related artifacts in the area.

At the AGM which followed our Chairman reported on the activities of the past year, and the following officers and committee were elected:-

Chairman: J. Hodgkinson — Hon. Secretary: Mrs. S. Swift
Vice-Chairman: Mrs. D. Meades — Hon. Editor: D. Crossley
Hon. Treasurer: R. Houghton
Committee: Miss L. Funnell, D. Combes, B. Herbert, A. Scott, Mrs. M. Tebbutt, Mrs. S. Broomfield, G. Swift, Mrs. A. Dalton.
Auditor: Miss D. Abbott

Mr. C.F. Tebbutt was re-appointed as President.

After an excellent ploughman's lunch, organised by local helpers, members and friends travelled to Beauport Park where Dr. and Mrs. Brodribb had kindly uncovered some of the most interesting parts of the excavated Roman building

for us to see. Plans and excavated material were displayed and a detailed explanation of the whole site was given. Once again it was generally agreed that this "whole day" format for the summer meeting and AGM was a great success.

A new look at the end of the Wealden Iron Industry

In a recent newsletter of the Sussex Industrial Archaeology Society there was a report of the last working day in 1813 at Ashburnham Furnace as described in a Sussex newspaper of the late 19th century and by someone claiming to have been one of the two boys employed at the works. The other boy on that last day drank himself to death with a bottle of gin according to the same report - but that is incidental to the present theme!

Why did 1813 mark the end of the Sussex industry when only in the next county there seems to have been a resurgence of activity at just about the same time?

Recently, a large roller flour mill at Coxes Lock on the Wey Navigation was closed and there has been opportunity for the Surrey Industrial History Group (SIHG) to examine both the mill and the records.

It has been known for many years that Coxes had been an iron mill in the late 18th century (from 1783) and there is a local iron ore which was surface mined by trenching between Weybridge and Wisley. This was a geological situation similar to the Weald, i.e. Bagshot Sand/Bracklesham Clay (?) - a sand/clay junction (1).

Alexander Raby and Obadiah Wix Rogers (of East Grinstead and elsewhere) were associated with the early operations at Coxes Lock and against much opposition installed a hammer c.a. 1790 known locally as "Hackering Jack". However, by 1812 the works were operated by a firm of Hoop & Iron Manufacturers of Dowgate Wharf London - John Bunn & Co. and this is where the story becomes more interesting.

1812 is a date when, after the assassination of Spencer Percival in the House of Commons, a local Sussex figure takes the helm, - Robert Jenkinson of Buxted Park Second Earl of Liverpool.

His term as Prime Minister continued for 15 years - the next longest term after William Pitt and heralded by a state of war on all fronts. Napoleon invades Russia - Napoleonic was throughout Europe, America declares war on Britain. On the home front, Luddite risings leading to the Peterloo Massacre in 1819.

This surely was a situation calculated to require large Government orders by the Department of Ordnance and although Ashburnham seems to have registered a "none event", Coxes in 1812 issued trade tokens showing a mill with (still) recognisable water wheel culvert and with four smoking chimneys above the mill building (since rebuilt) and bearing the Bunn iron trade description. Significantly perhaps, the end of the Jenkinson Administration (1827) also coincides with the near end of iron working at Coxes (1829).

Did Coxes wage bill in 1812 increase so much that trade tokens were required in a period of general coin shortage (2)? What do the four chimneys represent? John Wilkinson invented the cupola in 1794 and this would have been ideal for casting cannon balls from pig iron and scrap without need for further refining - only an extra need for coke.

A strange ore (?) sample - apparently of igneous origin - was recovered from Coxes in 1953, apparently not a native type and highly magnetic - a material which would have been valuable as an oxidising agent in the Puddling process then established some 30 years at Funtley (Hants) and known to supply "hoop" iron to the Navy at Gosport.

Was hoop iron therefore produced by the new process at Coxes, to meet increased Naval demand?

The most difficult question, however, is why Sussex appears to have played no part in these operations. Coal supplies from London docks, brought by sea from Northumberland or Durham, could have been delivered very conveniently to Coxes via the Wey Navigation - as could pig iron, imported ore, etc.

Perhaps Sussex had just failed to re-equip for the "New Technology" and when the iron trade enjoyed a boost in 1812 it was all too late. This and the difficulties of transport in the Weald to link industry with London and the Ports (Sussex canal transport had scarcely developed by this time - the Ouse Navigation, however, had reached Balcombe in 1812 and, incidentally, John Hodgkinson, one of the Outram-Hodgkinsons, to which family our Chairman Jeremy Hodgkinson is also related, completed the work originally engineered by William Jessop).

The Wey and Arun Canal was completed in 1816 (3), and the Adur Navigation after 1825 (4).

(1) Surrey Archaeological Collections Vol 34 p 115
(2) No copper coinage was issued between 1807 and 1821 because of the price of copper. (London's Lost Route to the Sea P.A.L. Vine David & Charles 1973 p 64
(3) IBID pp 58-67
(4) IBID p 72

T.E. Evans

Casting of 42 Pdr. Guns in the Weald

According to E. Straker (Wealden Iron - 1969 - pp 159-160), Fuller did not make any guns over 32 pdr in the Weald and (p 159), "Fuller refused to make 42 pdrs".

The comment made by C.J.N. Trollope, Fingrinhoe, regarding the size of hearths quoted by Straker and cannon recorded in PRO Records delivered by Geo Browne, c. December 1670, raised the important point of where any discrepancy might arise. PRO. WO 81/12. 59305 details 10 cannon 11 feet long and varying in weight from 66-2-14 to 63-3-21 (cwt-qrs-lbs).

The daily output of a Wealden furnace was usually considered to be 1.5 tons in 24 hours and it has been assumed that a double furnace was required to cast a 32 pdr. cannon, listed by Straker as 6,384 lbs but PRO weights are often 200-300 lbs heavier. In addition, allowance has to be made for the "head" in the amount of metal poured into a mould.

The difficulty of reconciling these factors was put to David Crossley and he pointed out that unpublished Fuller letters reveal the fact that, with great care and management of the furnace, two or more days melt could be accumulated in the single furnace. This was possible "but a very tricky and delicate operation", giving a new view of their ability in the Weald at this time.

The major factor limiting any increase in the output of the Wealden furnaces was the shortage of blast air at an adequate pressure. In the 18th C. in the Ural, using furnaces not unlike those of Wealden size, the output of one is recorded as doubled when the blast was increased. The shortage of energy was noticeable, even during the comparatively short number of Foundays in an average year. The short distance from the watershed, together with the comparatively low rainfall, always penalised the Weald and they were never able to achieve bellow and furnace sizes in the 18th C as used in other parts of Britain, with consequent lower furnace output.

This new approach to casting capacity is worthy of deeper study, possibly already known by some, but of considerable surprise to others to think that so much iron could be accumulated in the hearth and maintained over 48 or more hours at pouring temperature.

An exchange of information would be appreciated.

D. Braid

Bog Iron Deposits in the Weald and Britain

Considerable field work has been carried out by Dieke Postma in Denmark over the past decade on the fact that modern deposits are being created of iron carbonates, vivianites, and ochres. These are found in peat bogs with slow water movements and the drainage comes from areas that makes possible the presence of ferric-oxyhydroxides in the bogs. How the latter comes to be deposited there is the subject of further investigation.

In the WIRG Newsletter No. 3 November 1982, p3, para 6, is a reference to a foray on Blindley Heath to look for bog iron. Any information on this and other sites would be valuable.

Prof. R.F. Tylecote and Rodney Clough have recently had a paper published in OFFA, Band 40.1983., "Recent Bog Iron Ore Analyses and the Smelting of Pyrites Nodules" which should be interesting to members, particularly those concerned with the possible iron ores used in Southern England by prehistoric man. Prof. Tylecote has verbally communicated that he has seen ochreous deposits apparently growing in volume in the N. England within recent years.

D. Braid has mid 18th C. written comments about the use of the ochreous types of iron ores and would welcome evidence as to possible deposits in Britain and any comments as to whether these are dynamic in growth. Modern drainage programmes will generally have destroyed the environment, even if suitable iron impregnated water continues to flow. It is likely to be found in areas where the oxygen content is less than 4mg/1 which usually is in areas of very slow moving or stationary water laden with decayed organic material.

A geologic Image Processing study of Landsat Remote Satellite pictures is being planned using the latest computer techniques for thematic mapping of the area of Dikma's studies in Denmark and also of the extensive areas in Karelia that were the vital strategic and economic sources of iron ore for the 18th C. gun factories at Petrozavodsk and elsewhere in this region. The use of ore from marshy areas and from shallow lake areas (max 6m) is well documented at the end of the 18th century.

Any help to identify similar marginal areas of shallow water or muddy, brackish, or vegetation laden water, where ochre or any form of oxides in masses or sedimentary form are present, might provide areas for field study to be identified with sections of Landsat studies, thus being very likely to be of great assistance.

D. Braid

Haxted Mill Museum

In spring 1984 the Haxted Mill Museum and WIRG organised their second promotional display at the Haywards Heath Building Society in East Grinstead. The main attraction was two models operating in the window, and controlled by a "touch" sensitive switch on the window. In this way the models could be switched ON and OFF by people outside the shop. One model was of a water-wheel operated rag/paper pulping hammer and the other a visual demonstration of the scissor-like action of a corn grind-stone, showing how the flour is moved out to the edge of the stone as it is ground.

There was also a static display of photographs and a map of water-powered mills, blast-furnaces and conversion forges in the area. To add to the interest a prize was offered if the use of two ancient farm implements was known, for which there was only one winner.

During the year Mr. Woodrow, the curator of Haxted Mill, decided to retire for the second time; the first time was from being a veterinary surgeon. This means that the mill, house and tearooms have been sold and it is hoped that it will remain as a museum.

In recognition of Mr. Woodrow's generosity in allowing us to house our exhibits in the Mill over the years, he has been given an honorary membership of WIRG.

B. Herbert

Benhall Mill Furnace

Twice in the last year the bay at Benhall Mill (TQ 608376) has burst during periods of heavy rainfall. Unfortunately, by the time WIRG heard about it the bay had been repaired so there was nothing of interest to be seen.

If the bay should burst again during the winter we will endeavour to get there before the road repairers.

Newly discovered iron-working sites

Any member finding traces of a bloomery furnace (usually identified by a scatter of slag), or remains of a water-powered site, are asked to get in touch with:

Mrs. Anne Dalton, Rotherdale Cottage, Fir Toll Road, Mayfield, Sussex, TN20 6NB
Telephone: Mayfield 873421

who is collecting this information and will be pleased to give further details.

Bow Bells Mileposts

Repainting the "Bow bells" cast iron mileposts in the town was the East Grinstead Society's project for 1984.

These posts were provided by the 18th century turnpike trusts that served the area and are part of a series along the A22. A full survey will be found in Sussex Industrial History vol. 5 (Winter 1972/2), pp 3-8.

Their exact date is not known, nor their place of manufacture, but they are possibly from one of the local forges. Their design, five bells diminishing in size suspended from a bow under the number of miles from

London, has led to the belief that they punningly represent the famous bells of Bow church. There is no evidence, however, that Bow church was ever used for measuring distances from and the designs may be simply ornamental with no special significance.

However, they remain an important part of our heritage and one which deserves careful conservation all the more because they now serve little functional purpose.

Seventeenth century cannon-boring bar from Stream Furnace, Chiddingly

This important artifact, described by David Butler and C.F. Tebbutt (Post-Medieval Archaeology Vol. 9(1975)38) is the subject of further recent research by E.M. Trent and E.F. Smart (Historical Metallurgy Vol. 18 No 1 (1984)8). One of the cutting tips was sectioned and microscopically examined to determine the structure, and was heat treated with the object of finding more about the composition and original heat treatment of the steel cutting edge. Trent and Smart concluded that the tool is a sophisticated product which would have required a high degree of metallurgical and engineering skill in manufacture, unaided by instruments for measuring temperature and hardness such as are available today.

The bar is now displayed in the Iron Gallery at Anne of Cleves Museum, Lewes. See also WIRG Bulletin No. 8 (Spring 1975)28.

Wanted

Reports have reached the WIRG committee that some three or four or even five years ago, at a meeting of an historical group, in or near Lamberhurst, in the county of Kent, that the subject of "Wealden Iron" was the topic of the day. That, after this meeting, a group of attendees were led to a field, under cover of darkness, to inspect some cast-iron railings, similar to if not the same as those around St. Paul's Cathedral in London, which, according to surviving documents, were cast at the Lamberhurst Furnace nearby. Hearsay evidence suggests that great difficulty was found in relocating the railings, as they were hidden from sight within a hedge.

It would be interesting to know the exact whereabouts of the railings.

B.K. Herbert

Wealden Iron Bibliography

A bibliography of Wealden Iron related subjects is being undertaken by the writer with help from the other committee members. Each reference is noted on a punched card so that the desired information (see below) can be withdrawn. This is carried out by passing a needle through the punched holes around the periphery of the stack of cards.

The information available from the cards is:

A) Author's name, A to Z
B) Where the reference was published, name of journal
C) Subject matter:-

1. DIRECT PROCESS: BLOOMERY FURNACE: SLAG TYPE
2. INDIRECT PROCESS: BLAST FURNACE: SLAG TYPE
3. CONVERSION FORGE: CHAFERY: FINERY: SLAG TYPE
4. IRON ORE: SANDSTONE: FIRESTONE: GEOLOGY: CLAY: BRICKS

5. CHARCOAL: FORESTRY: COAL
6. FIREBACKS: GRAVESLABS
7. CANNONS
8. TRACKWAYS: HILLFORTS
9. IRONFOUNDERS: IRONMASTERS: GUNFOUNDERS: IRONWORKERS: BLACKSMITHS
10. ECONOMICS: ACCOUNTS: INVENTORIES: PEOPLE: (NOT IRON PEOPLE)
11. WROUGHT IRONWARE: BAR IRON: BORING BAR
12. CAST IRON WARE: (NOT FIREBACKS, GRAVESLABS OR CANNONS)
13. IRONWORKING SITE LISTS
14. MUSEUMS: EXHIBITIONS: CONTESTS: CONFERENCES: TRUSTS
15. TECHNOLOGY: WATER SYSTEMS: ENERGY SOURCES: (NOT CHARCOAL OR COAL)
16. MAPS: DOCUMENTS PRE-1850
17. DATING
18. ACCOMMODATION: HOUSES
19.
20.
21.
22.
23.
24. UNKNOWN: OTHERS

An open mind was kept as to which out-of-the-Weald references to put in, and so it covers the early iron industries and products throughout the world. It is hoped that in the near future this bibliography will be made available to members for a small sum; there being nearly 500 references to date.

B. Herbert

New Bloomery-furnace site form

When the blast-furnace and conversion forge survey was undertaken, a standard form was produced on which to enter the information gathered by the field-walkers. Unfortunately, bloomery-furnaces have been the poor relation and their "statistics" have not been collected systematically. However, this oversight has been rectified with the generation of a four page site form especially for bloomery-furnace sites.

Its main functions are:-

1. To enable these sites to be found again at a later date
2. To produce a consistent record of bloomery-furnace sites
3. To allow statistical information to be made on the data.

These site forms are available from the WIRG publications officer whose address is noted at the back of the Newsletter, under "Publications for Sale".

Recording of Cannon

Following notes in Newsletters nos. 2 and 4, one of our members has kindly offered to collect information. Please send details to:-

Mr. D. Braid,
27, Circle Gardens,
Merton Park,
London SW19 3JX

13 14 15 16

WIRG Bulletin

The Editor has asked that contributions for the next volume should be submitted by the end of January 1985. Please send to:-

D.W. Crossley (Hon. Editor),
Division of Continuing Education,
The University,
Sheffield, S10 2TN

Articles for Publication

Members writing articles for other publications on iron-related subjects might like to write a summary of the article for mention in the WIRG Newsletter in order to bring the article to the notice of other members.

To be added to the Book List

The History of Water-Mills, the Wealden Iron Industry, and Geology of the South-east. (22 pages). Herbert B.K., Smart C., Woodrow C.E. 65p (50p).

Publications for Sale

The following publications are for sale from:-

Mr. B.K. Herbert,
1, Stirling Way,
East Grinstead,
Sussex, RH19 3HG

Prices quoted include postage. (Prices at meetings or collected by hand).

A Gun-casting Furnace at Scarletts, Cowden, Kent
by: D.W. Crossley 0.90 (0.75)

The Excavation of a late 16th/early 17th Century Gun Casting Furnace at Maynard's Gate, Crowborough, Sussex 1975-1976.
by: O. Bedwin 0.75 (0.60)

The Excavation of Three Roman Bloomery Furnaces at Hartfield, Sussex
by: C.F. Tebbutt 0.90 (0.75)

Wealden Bloomery Iron Smelting Furnaces; (A survey of Wealden Bloomeries covering an area of approx. 200 km sq).
by: C.F. Tebbutt 0.75 (0.60)

A Middle Saxon Iron Smelting Site at Millbrook, Ashdown Forest, Sussex.
by: C.F. Tebbutt 0.90 (0.75)

CBA Research Report No. 29; Archaeology in Sussex to 1500 AD.
by: P. Drewett NOT BY POST (3.50)

Bulletins of the Wealden Iron Research Group:

VOLS 2,5,7,8,12 ARE OUT OF PRINT 17/9/10/

Volume 1 to 11	each 0.75	(0.50)
Volume 12 to 17	each 0.90	(0.75)
Volume 1 to 4 new series	each 1.65	(1.50)

The Finch Foundry Trust and Sticklepath Museum of Rural Industry (a water-powered forge on Dartmoor)(50pp) by: R.A. Brown 1.15 (1.00)