

# Newsletter 65 Spring 2017

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## Letter from WIRG Chairman Bob Turgoose

WIRG has a list of archaeological research objectives and a foray was made in October 2016 to Cullinghurst Wood, near Hartfield, which is top of the list. WIRG has visited the site in the past and a single sample of charcoal recovered from a slag heap had given a date of about 400BC, some 300 years earlier than other dated bloomeries. The return visit was made to seek further samples for dating. However, the foray added to the complexity of Cullinghurst Wood, five bloomery sites were previously known but the location of the bloomery first visited did not agree with any of those hitherto recorded. Further work is clearly necessary. In February 2017 WIRG returned to Horsmonden. Several interesting finds were made which will be the subject of a forthcoming Bulletin article.

In recent weeks we have placed both Straker's book *Wealden Iron (1926)* and the second edition of Cleere and Crossley *The Iron Industry of the Weald (1995)* on our website. Together with copies of the Bulletin these publications provide a comprehensive source of information on the iron industry of the Weald. We will continue to look out for difficult-to-access written material

## WIRG BULLETIN 37, 2017

Articles for publication are invited for this year's Bulletin. **Notes for Authors** are available on the WIRG website: click to ([www.wealdeniron.org.uk/Notes-for-Authors-August-2016.pdf](http://www.wealdeniron.org.uk/Notes-for-Authors-August-2016.pdf)) or from the Editor, Jeremy Hodgkinson, and all those wishing to submit an article are expected to have familiarised themselves with them before sending their article(s) to the Editor. The closing date for articles for the Bulletin will continue to be 31 March.

on Wealden iron and, if possible, place it on the website.

Tony Singleton has decided to stand down as web master. He remains on the committee. It is to Tony's credit that we have a first class website and on behalf of WIRG I thank him for his contributions over many years. We are fortunate that Chris Broomfield has agreed to become our webmaster.

Lastly a request. Has any member prepared a map or maps plotting the locations of all known bloomeries, blast furnaces, forges and ore sources onto OS maps. If so, please contact me. I have in mind that a comprehensive map could be one way in which the first 50 years of WIRG could be celebrated.

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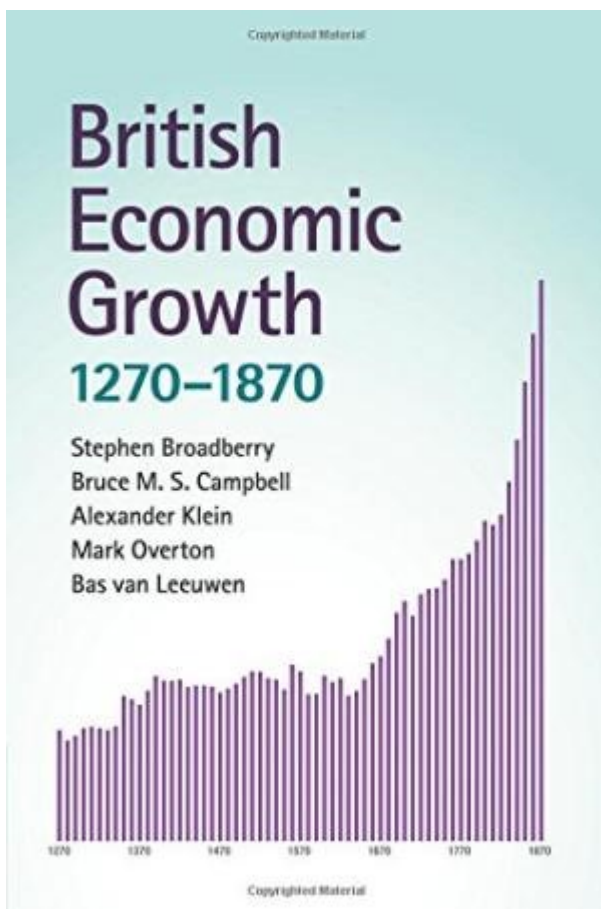
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## Book Review

**British Economic Growth 1270-1870** by Broadberry, Campbell, Klein, Overton, and van Leeuwen published in 2015 by Cambridge UP is an ambitious and fascinating account of six centuries of economic and population change. In a brief review important questions relating to methodology and data sources cannot be addressed, instead the focus is on some findings for the medieval period of possible relevance to the Weald's iron industry.



The population of England trebled from about 1.7 million at the time of Domesday Book (1086) to 4.75 million in the 1290's, the medieval maximum. The Black Death in 1349 and many subsequent outbreaks of plague saw the population fall to 1.9 million in 1450. By the middle of the 15<sup>th</sup> century the population was only slightly greater than in 1086.

Population estimates for individual counties are much less certain than the national figures but they indicate that the Sussex population doubled from 60,000 in 1086 to 120,000 in the 1290s, by 1377 it

had fallen back to Domesday levels and by 1600 had risen to 100,000, about 20% below the maximum reached three centuries earlier.

In the years after the Black Death economic activity fell, as would be expected, but the decline was less than the fall in population, and as a consequence most households became substantially better off, and these higher incomes were maintained until the early 16<sup>th</sup> century. There are no income figures specifically for Sussex but no reasons to suppose that the county fared better or worse than England as a whole.

The implications of these shifts in population and incomes for the production of iron products in the Weald for sale locally throughout the late medieval period are not straight forward. A smaller population would suggest lower demand but higher incomes could create greater demand for iron products. Much food for thought.

(Prices from £22.10 from the on-line book site Abebooks.)

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### STRAKER'S WEALDEN IRON ADDED TO WIRG WEBSITE

As part of the forthcoming commemoration of WIRG's half century, a first edition copy of Ernest Straker's seminal monograph, *Wealden Iron*, published in 1931, has been scanned and is now available to view on the Group's website. Navigation through the book has been aided by the inclusion of hyperlinks from the contents pages to the beginning of each chapter, to each section of the gazetteer and to the associated maps of sites. The cost of this was funded from the Phyl Pettitt bequest. The book can be accessed from the Publications page of the website or by typing [www.wealdeniron.org.uk/pub.htm#WIS](http://www.wealdeniron.org.uk/pub.htm#WIS) into the address bar of your web browser.

Regular readers will also know that Cleere and Crossley's *The Iron Industry of the Weald* (1995) is also available from the website. Both of these free to download.

## WIRG Winter Meeting 2017

January 28<sup>th</sup>. The group's usual winter meeting took place at Nutley, Bob Turgoose in the chair. There were two presentations of current research. The first was made by Jonathan Prus, presenting results that he had obtained with WIRG member Jeff Leigh and two colleagues based at the University of Brighton.

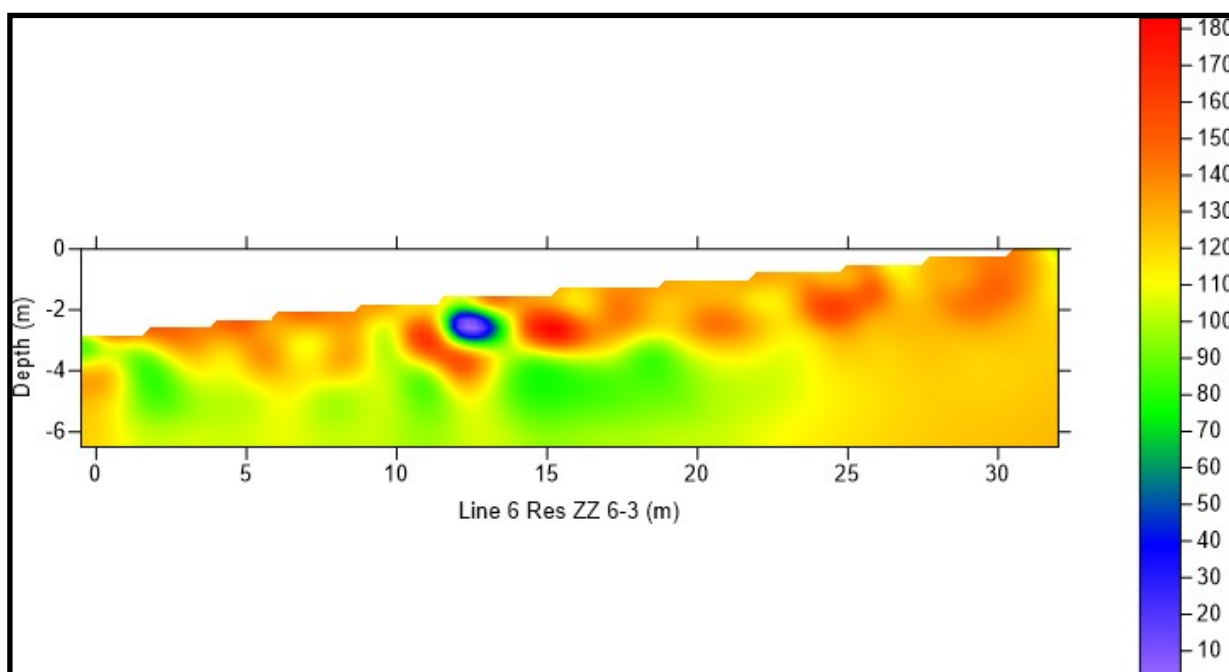
Although the title of the talk was "Choosing the right ore: some new insights into the craft skills of bloomery smelters in the Weald" but it went some way beyond the smelting process itself. Jonathan displayed the results of several hundred analyses of ore and slag from the high Weald and showed that there were big differences in the composition of both ore and slag from particular sites, but that the average compositions at each site were remarkably similar. The most likely interpretation of this is that there was some kind of "recipe" for making bloomery iron and that the smelters of old had to make a careful selection of ore, mixing the richest with some that was less good, probably to get a good slag with a low melting point that would separate well from the metallic iron of the bloom. Few people, if any, can judge ore quality by eye nowadays.

The speaker told of a second series of slag samples from a different set of sites, analysed the same way.

The slag composition at this set of sites was identical with that from the first set, showing that the odd-looking histogram of results was not just an accident. Both histograms showed an unexpected set of analyses that were too poor in iron, calcium and manganese to be bloomery smelting slag. He suggested that this anomalous slag was, perhaps, the result of adding sand (a known flux) to the mix during a welding process, perhaps while making iron and steel composite tools or weapons.

There were challenging questions from the floor, including at least one which the researchers had not thought of: were the possible welding slags concentrated in any particular area?

Next, Ethan Greenwood, the PhD student being sponsored by WIRG, gave a short presentation on his research up to date and focused on his fieldwork at Chitcombe bloomery, Broad Oak, East Sussex. He explained the three geo-prospection survey techniques that were used on the site. These included Magnetometry, which is a type of survey that detects changes in the earth's magnetic field caused by ferrous material and mapped the lateral extent of the site, earth resistivity tomography (ERT), a technique that measures the resistivity of material between two electrodes and maps vertical sections

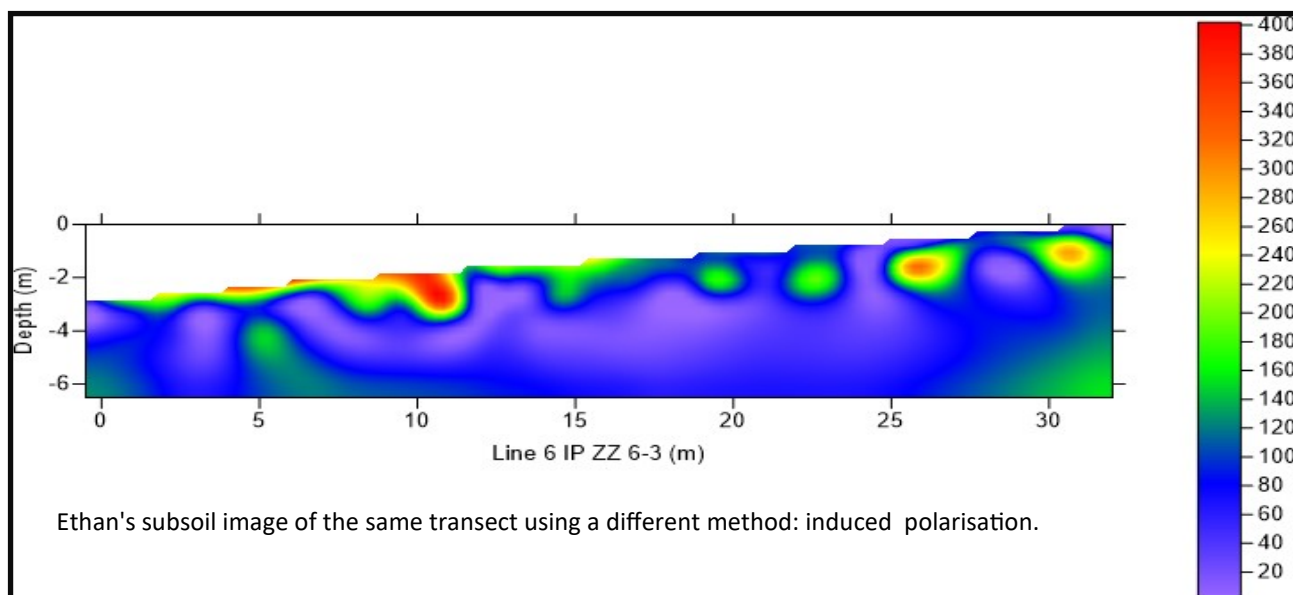


Ethan's sub-soil image of a transect of the Chitcombe site: method, imaging using earth resistivity tomography.

See next page for a different image of the same transect.

through the earth to a depth of 12m, and Induced polarisation (IP), a technique that measures the decay of charge held by natural capacitors in the earth and also maps vertical sections through the earth. Excavations undertaken by Ethan and the Hastings Area Archaeological Research Group (HAARG) col-

lected a large dataset of material from the waste heap. and preliminary results show that the amount of slag within the deposits could be 40%. Ethan is further analysing samples collected for a more precise understanding.



#### AN IRON POT (A VERY ODD ONE).



interested to find out what the vessel was used for. If you know, please contact the Editor.



But what was it for?

The iron pot illustrated here was found near Goudhurst. It is 70cm high and 90cm wide at the top. It is pierced with holes around its top edge and has four diametrically opposed lifting or bearing lugs. Mr Tim Davis sent the pictures and would be

### **Camping out at Ashburnham: possible insight into the lifestyles of early modern ironworkers.**

Just under one kilometre to the South East of the old Ashburnham Forge is a large open area known as Tent Hill ( TQ 697156 ).

The word Tent has long been associated with a " temporary shelter ". The monarchs used to have a Master of Tents and Toils who was responsible for all the royal hunting equipment, including temporary accommodation whilst on the hunt.

This particular Tent Hill, according to local folklore, was so called because

" there, the tents of besiegers ( i.e.. the Saxons ) attacking the red-haired men (the British ) were supposed to have been pitched ".

Nowadays we are told Tent Hill is where William the Conqueror is reputed to have camped on the eve of the Battle of Hastings ( albeit over 5 km from the site of the battle ! ).



**Tent Hill as it is today**

But Rose Fuller Whistler, the incumbent of Ashburnham Parish in 1883 has provided us with the most likely origin of Tent Hill, when he writes about the contents of the old Ashburnham Registers in the Sussex Archaeological Collections Volume 33. Several of the earliest burials recorded therein refer to iron workers in the locality, for example;

1576 Wyllm Foldyth, a fforge man was buried the 18 daie of Aprill.

1582 Mychall, son of John Bene, the collyer, buried 30 daie of May.

1600 Morgan Lawrence a welshman from the tent called Mynters was buried 20 daie April being Thursdaie. ( Almost certainly an iron worker from South Wales )

1600 John Morrell at ye tent called Afryke was buried the twentieth daie of september.

Here I can do no better than to quote Fuller Whistler himself;

" ....the ironworkers lodged in temporary habitations --Tents -- the press of work being unusual and of a temporary character.....Several fields very near Ashburnham Forge retain the names of 'America', 'Africa' etc. the whole district being of a wild heathy almost uncultivated character, making the names chosen quite appropriate to the locality".

Tent Hill could almost still be described as such. So was this the temporary abode of Ashburnham iron workers in their tents, hired when extra labour was required ?

Let us hope that Mr. Huckstep was not one of them:

"1583 Stephen Huckstep of Dallington sought his own death in a ditch buried 11 daie of December."

#### **But isn't the name Rose Fuller very familiar?**

Rose Fuller Whistler ( RFW ) was born in 1825 in West Hackney, Middlesex. He attended school in Sutton Valence and graduated from Emmanuel College Cambs. in 1845. For 14 years he was Rector of Hollington, then became Vicar of Ashburnham and Rector of Penhurst from 1879 - 1888. He later became Vicar in Eaton, where he he died in 1894.

His name would lead us to believe there is an obvious connection to the ironmaster Fuller family. The original Rose Fuller, ironmaster, was born in 1708 and died in 1777.

The complete Whistler family tree and annals, produced by RFW are printed in the Sussex Archaeological Collections, vol. 35. This shows no ' Fuller ' or 'Rose ' connection before the birth of RFW himself.

There is, however, a connection to another family of important 18th Century ironmasters.

RFW's father was Edward Webster Whistler, born in 1799 at Newtimber Rectory, where his father, Webster Whistler was Rector. RFW's mother was Mary Ann, heiress of John Alcock of Sheen, co. Staff.

The ' Webster ' christian name has a connection to

Sir Thomas Webster, lessee of Beech furnace and Etchingam forge and owner of Robertsbridge Abbey furnace and forge ( 1725 - 1751 ) ; also purchaser of Battle Abbey and its lands in 1721.

Similarly, 'Whistler' became a common name in the Webster family. It happened thus:

RFW's great great great grandfather, John Whistler ( 1624 - 1685 ), a Vicar of Clapham, co. Sussex, had a younger brother called Henry Whistler ( 1634 -1719 ) of Epsom and Bengoe, co. Herts.

This Henry had a single daughter Mary, who married a Mr Cheek of Copt Hall, Essex. Mary died in 1707 and her daughter Jane was heir to her grandfathers' considerable estate.

When Jane married Sir Thomas Webster, her inheritance helped him to purchase Battle Abbey and the Robertsbridge Abbey furnace and forge.

RFW himself writes in his annals;

" .....Henry Whistler of Epsom, who died in 1719 at the age of 85, was the grandfather of Jane, wife of Sir Thomas Webster Bart., the purchaser of Battle Abbey and lands, and it was mainly by the means of the wealth which this lady inherited from him ( HW ), that the Webster family acquired their Sussex possessions ". Her grandfather's surname Whistler became the Christian name of their first son, Sir Whistler Webster and of his son too (although he died unmarried aged 18 ).

From here on, there are several Whistler Websters, and Webster Whistlers in the family tree.

These names of former ironmasters continued in subsequent generations, with RFW naming his third son Fuller Whistler ( b.1859 ) and fourth son, Webster William Whistler ( b. 1870 ).

Geraldine Crawshaw

### Sheffield trip 7 – 9 April

We start with a walking tour of industrial sites in the city Friday afternoon, visit Wortley Forge, Rockley furnace and Shepherds Wheel on Saturday and Eccleshall Wood, Abbeydale and Kelham Island museum on Sunday.

Approximate cost £160 including accommodation and entry fees – but not meals.

There are only three places left so if you wish to come let Tim know at [tjsmith560@btinternet.com](mailto:tjsmith560@btinternet.com) or Tel 01403 710148 by **2 April latest**.

### Meet another member of the WIRG Committee: Dr. Judie English

I have been involved in archaeology since 1968 when, unable to start a new job in Surrey because both my intended flat and laboratory were flooded, I decided a dig at a place advertised as 'By that South Cadbury that was Camelot' was irresistible. An Iron Age hillfort in Somerset refortified in the 5<sup>th</sup> / 6<sup>th</sup> century by someone who had the contacts and the taste to import his best ceramics from North Africa – I was hooked! After a long career in medical research, with archaeology as a hobby, the latter took over and now I spend my time doing landscape work and teaching adults.

Landscape archaeology – what goes on outside the trench? Getting away from 'sites' and trying to see



Judie recording detail. Audience captivated.

how they were set within their environmental context, how they related to the available resource base, how they linked with each other to form a social economy and, very fashionable at the moment, how people in the past regarded the visible monuments of their own past.

Archaeological survey, an arcane skill involving measuring lumps and bumps in the ground has involved me with sites varying from prehistoric field systems (my doctoral obsession) to 19<sup>th</sup> and 20<sup>th</sup> century military earthworks.

My interest in the iron industry stems largely from studying Late Saxon and Medieval settlement in the Low Weald, and, as always, the economy and resource utilisation underpinning man's use of the land. Around where I live (Cranleigh in Surrey) bloomery sites appear to be associated with high status land ownership – monastic or aristocratic. Is this generally true?

## What might a Seventeenth Century ironworks have looked like?

There are pitifully few images of Wealden ironworks and none have enough detail to inform us about how they worked. The literature of pre-C19th. furnaces is pervaded by images derived from the pictures of the French Encyclopaedists in the later C18th. And we seem to rely on those

Tim Smith has turned up an interesting picture of a C17th. Swedish cannon works held, in the Rijksmuseum in Amsterdam. You can see a number of large guns on the ground in the centre-left foreground of the picture. He suggests that the building next to the cannon is a heat-treatment unit of some kind. This is very plausible: the date of the picture is just after Prince Rupert's patent for annealing cast guns.

A close look at the picture will reveal a water wheel, apparently behind a door through which a cannon is being fed. This may indicate a cannon borer at work,

or perhaps the wheel simply works the bellows for the fire next door.

The furnaces are probably in the very large building shown top-centre of the detail. There is a flume along the wall facing, and there may be multiple wheels creating blast for more than one furnace; maybe six furnaces, if we take this at face value.

It would be very rash to suggest that a furnace in C17th. Sweden was anything like its Wealden counterparts, but this picture is so different from the canonical image of a pre-coke blast furnace that we may well take pause for thought.

Fortunately, we can view this picture in high resolution at <https://www.rijksmuseum.nl/en/collection/SK-A-1510> and zoom into detail by using the controls at the bottom right of the picture.



## Detail from Hendrik Trip's Cannon Foundry in Julitabruk, Sweden, Al-laert van Everdingen, 1650 - 1675

oil on canvas, h 192cm × w 254.5cm × d 10cm.

The Trip family – powerful international arms dealers – owned this cannon foundry in southern Sweden. It was a perfect location: iron ore was mined there, and there was ample waterpower, inexpensive labour and fuel (wood). The family built what is known as the Trippenhuys on the Kloveniersburgwal in Amsterdam. The Rijksmuseum was accommodated in this grand residence in the 19th century.

## Haematite ore at a Wealden blast furnace

Long term WIRG members, Carla and Robin Barnes, who own the Fernhurst blast furnace site and kindly invited WIRG to display at their Open Weekend last September, brought the illustrated brown nodular



Nodular hematite ore found at Fernhurst blast furnace

material found on the site to our stand for identification.

This nodular lump, the size of the palm of your hand, was very dense, non-magnetic and scraping the surface revealed an almost metallic sheen.

Could it be bloomery slag? It certainly had a familiar look to this but was even heavier than a piece that size should be. Could it be iron pyrites, and if so useless for ironmaking because of its high sulphur content? To test for pyrites, I struck it with a steel to see if it would spark – it did not, but this action broke off a small sliver of material which showed a fracture surface grey and smooth with no porosity as expected from slag. Subsequent analysis by Alan Davies gave the surprising result that it was in fact a rich hematite ore with an iron content close to 61.5% which is far higher than the layered siderite (iron carbonate) ore of the Weald which typically assays at around 40% Fe. Also it contains just 0.66% silica so would be excellent for a bloomery smelt – along with 6.5% alumina, and about 4% lime and 1.4% magnesia. The specific gravity is approximately 4.2 (g/cc) this exceeding

the 3.96 (g/cc) of pure siderite ( $\text{FeCO}_3$ ), but less than the 5.3 (g/cc) of pure hematite ( $\text{Fe}_2\text{O}_3$ ).

Where did this ore come from? The nearby mine pits to Fernhurst have not shown anything like this. Serendipity then took over. Later that day, a sample of similar ore was brought to the stand. Found at a bloomery site dated as Roman, at Catherington in Hampshire, which the geological map shows is predominantly a plateau drift deposit, (now called superfluous deposit) and is potentially 80m deep, and composed of clays, silts and some clay with flint, pebbles and gravels.

A few weeks later, a sample of identical looking ore from Colemore, about 15km N of Catherington was sent to us. We were told there was a scatter of this on the surface in the area. On analysis, this proved also to be a rich hematite, almost identical in composition to that found at Fernhurst.

Since hematite ore cannot form in the geology of the Weald or even the chalklands of the Downs, we can only conclude that the ore was carried to Hampshire from more northerly deposits as a result of glaciation.

No doubt the ore was transported to Fernhurst which lies some 24km (15 miles) to the NE, and blended with the local siderite ore to enrich it, probably as a trial since, to date, only one piece has ever been found there.

Should anyone have found similar nodular ore on the



Nodular hematite from Colemore in Hampshire



**DORIS MAY 'DOT' MEADES****1929 - 2016**

In the passing of Dot Meades on 18th December 2016, WIRG has lost one of the last of its members who was there from when the group was founded. During the course of her membership she was on the Committee for much of the time as well as holding the offices, when the need arose, of Treasurer, Secretary, Chairman, Vice-chairman, Newsletter Editor and President. No further qualification could be required for someone to be defined as being at the heart of the group.

Born in Essex, her family moved to Sussex after the outbreak of war and she remained there until 2005. After secondary school in Horsa-ham, and starting work as a secretary, she married Tony Meades in 1951 and began her life as a farmer's wife and mother to three children. An interest in local history gained impetus after moving to Huggett's Farm, at High Hurstwood, in 1963 and when she joined WIRG at its foundation five years later she became part of the Buxted Group, taking an active part in its regular forays, often with her young children in tow. Huggett's was to become a regular meeting place for WIRG members. Forays in those days were informal with the foray leader, Joe Pettitt, preparing the documentary work for discussion with those taking part, and the foray proper starting after lunch. Dot's developing interest in history led her to study for the B.Ed degree at Sussex University and to begin a new career teaching the subject at The Beacon School, Crowborough. Her dissertation was on Ralph Hogge and his ironworks. Evidence of medieval settlement at Huggetts gave Dot another interest, and the excavation of the site gave her and others a further opportunity for practical archaeology. Retirement resulted in a move to Fairwarp where the idea of the 'indoor foray', allowing members to meet indoors to talk over the previous season's activities and any other interests, came into being. Sadly the move was followed by the tragic loss of their younger son,



Oliver, in a motorcycle accident in 1988. Increasing age and health issues caused Dot and Tony to move to Suffolk in 2005 to be nearer their daughter, and in 2010 her departure from active involvement in WIRG was marked by the presentation by the Committee of a picture by a local artist of a view of the Ashdown Forest she loved. Dot herself was an accomplished painter.

Dot's contribution to WIRG lay not merely in her work in the Committee, but in her first-hand knowledge of the industry through field work and documentary study. Of equal importance, perhaps, was the role she played in bringing together the members of the local groupings that characterised WIRG's organisation in its early days and, through social interaction, encouraged a more unified membership. She was wise and kind and will be greatly missed.

J S Hodgkinson

**PUBLICATIONS FOR SALE: contact Brian Herbert (brianherbert@btinternet.com)**

	PRICE	
	BY POST (UK)	AT MEETINGS
<i>British Cast-Iron Firebacks of the 16th to Mid 18th Centuries</i> , J. Hodgkinson (2010)	24.99*	<b>24.99*</b>
<i>The Wealden Iron Industry</i> , Jeremy Hodgkinson (2008)	15.99*	<b>15.99*</b>
<i>Excavations of a Late 16th/Early 17th c. Gun-casting Furnace at Maynard's Gate, Crowborough, Sussex, 1975-1976</i> , O. Bedwin.	2.10	<b>1.50</b>
<i>A Middle-Saxon Iron Smelting Furnace Site at Millbrook, Ashdown Forest, Sussex</i> , C. F. Tebbutt.	2.10	<b>1.20</b>
<i>The Fieldwalker's Guide and an Introduction to the Iron Industries of the Weald</i> , B. K. Herbert.	4.50	<b>3.50</b>
<i>Second series Bulletins: -</i>		
Volumes 1 to 24 (1981 to 2004)	each 2.10	<b>1.50</b>
Volumes 25 to 36 (2005 to 2016 parts 1 & 2)	each 2.60	<b>2.00</b>
<i>Note: Vols. 5, 10, 15 &amp; 20 have 5-volume cumulative indexes. Vols. 21 onwards are separately indexed</i>		
<i>Index for Wealden Iron, WIRG Bulletin 1st ser. Vols. 1-17 and 2nd ser. 1-20</i>	2.50	<b>2.00</b>

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**Hon. Secretary: Tim Smith** [tjsmith560@btinternet.com](mailto:tjsmith560@btinternet.com)

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**Editor of Wealden Iron, The bulletin of the Wealden Iron Research Group: Jeremy Hodgkinson** [jshodgkinson@hodgers.com](mailto:jshodgkinson@hodgers.com)

### **And finally, an appeal**

Not for your cash, although any nice fat donations will be put to good use! Rather a way of husbanding WIRG funds. Postage is increasingly costly and most communications with members, including this newsletter, can be sent by email. A growing percentage of WIRG members now receive the newsletter and notices of meetings electronically. If you are willing to join in with this please email the treasurer *Shiela Broomfield* [s.broomfield@clementi.demon.co.uk](mailto:s.broomfield@clementi.demon.co.uk) and let her know.

*If you get this by post it will be in black and white. The electronic version is in glorious technicolour.*