



**Historical Metallurgy Society  
AGM Summer Meeting  
Power and Control over Metallurgy Production  
Saturday the 8<sup>th</sup> June 2019**

9.00-9.50	Registration	
9.50-10.00	Welcome	
10.00-10.20	Sophie Adams	Powerful or Powerless metal: Late Bronze Age hoards in the southeast.
10.20-10.45	Nathaniel L. Erb-Satullo	Parsing power and production in the metal economies of the South Caucasus
10.45-11.10	Break	
11.10-11.35	Ethan Greenwood	Invasion Iron – the control of Iron production in the Weald.
11.35-12.00	Yaxiong Liu	Iron and the Qin empire: an exploration of possible connections between the iron industry and the rise of the Qin state during Warring States period
12.00-13.00	Lunch	
13.00-13.30	HMS AGM	
13.30-13.55	Pieta Greaves	Fit for a King. Reconstruction of the Staffordshire Helmet
13.55-14.20	Eleanor Blakelock	Craft working at Anglo-Saxon Rendlesham, is this the location of the royal palace workshop
14.20-14.45	Ole F. Nordland	Ironmaking in Middle Norway: Technological changes and political power in the Viking Age
14.45-15.15	Break	
15.15-15.40	Justine Bayley	Medieval urban metalworking – control or anarchy?
15.40-16.05	Paul Rondelez	Evolution in ownership of Irish ironworks in the 17th and 18th centuries
16.05-16.30	Richard Williams	State sponsorship of technological change in Prussian Silesia in the late 18 <sup>th</sup> Century.
16.30-16.40	Closing speech	



The **HISTORICAL**  
**METALLURGY**  
Society

## **Powerful or Powerless metal: Late Bronze Age hoards in the southeast.**

***Sophie Adams***

SUERC, University of Glasgow

Interpretations of the deposition of Late Bronze Age hoards have often been connected with perceptions of power. Be it the power of a few to remove vast quantities of bronze from circulation or the perceived ritual potency of the contents of the hoard or controls over making, distributing and breaking metalwork. This paper revisits the evidence in light of recent research on contemporary metalworking sites. By comparing the location and debris from the metalworking sites to that found in the hoards I will reconsider the relationship between making and depositing metalwork and question whether power is in the eye of the beholder.

## **Parsing power and production in the metal economies of the South Caucasus**

***Nathaniel L. Erb-Satullo***

Research Laboratory for Archaeology and the History of Art, School of Archaeology,  
University of Oxford

Large-scale metal production in Near East is often characterized as a centralized, elite-dominated enterprise. These interpretations derive in part from the well-studied examples of massive, fortified early Iron Age smelting camps at Timna and Faynan. Elsewhere in the Near East, however, the relationship between metallurgical production and the institutions of political power is underexplored. In the Caucasus, recent fieldwork and laboratory research has uncovered a variety of organizational modes in metallurgical economies, showing that scale, concentration, and administrative complexity are not always correlated. In the eastern Black Sea area, dozens of small copper smelting sites were mapped in field survey, most of which date to between 1300 and 800 BC. Spatial and archaeometric data suggest that there was little elite administrative control over this industry, which nonetheless produced huge quantities of metal. Farther east, in the central zone of the South Caucasus, survey and excavation has recovered metal production debris at a series of fortified hilltop sites. The placement of fortress sites and the metallurgical activities within them suggest an attempt to control or protect metalworkers and the projects of their craft. However, the social dynamics of these fortified hilltop sites, and the question of what individuals or institutions exerted this control, remains far from clear. These examples illustrate that the interpretation of power and control in metallurgical economies requires careful analysis of production activities within their broader spatial and social context.

## **Invasion Iron – the control of Iron production in the Weald.**

***Ethan Greenwood***

Exeter University

Recent research conducted within the Weald of Southeast England by Ethan Greenwood as part of his PhD research in conjunction with the Wealden Iron Research Group and Exeter university, as well as the Hastings Area Archaeological Research Group has looked to understand how the iron production in the region was being organised and controlled in the Roman period. The approaches used to answer this research question were multidisciplinary, with a combination of geo-prospection surveys, including magnetometry, Earth Resistivity Tomography, Induced Polarisation, and Electromagnetic, as well as excavations. A number of sites were looked at in the area including Chitcombe, Footland, and Kitchenham Farm, with other sites being drawn in from the literature. This research has started to show how iron production was managed and controlled by the Roman military from the point of the Claudian invasion with the setting up of large-scale industrial sites identified by smelting workshops and intensive smelting. It also showed the wider organisation of these sites informing on the possible social status of those in control and how this is spread across the landscape.

## **Iron and the Qin empire: an exploration of possible connections between the iron industry and the rise of the Qin state during Warring States period**

***Yaxiong Liu***

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The iron production system in early China followed a unique technological trajectory, majorly favouring the cast iron smelting technique in the Central Plains area since 5th century BC. Focusing on the iron production in the Qin State during the Warring States period, this research has analysed a large number of iron objects unearthed from Qin burials dated to this period. The results suggest that a well-developed iron production system based on cast iron smelting has been established since the Late Warring States period (4th to 3rd c. BC), with multiple techniques adopted to improve the mechanical properties of cast iron for different purposes. Based on this, this research also set out to theoretically explore the mutual impact between iron industry and its social background, including the state endeavour to facilitate the iron industry, and the possible connections between the rise of the Qin empire and the blooming iron industry.

## **Fit for a King. Reconstruction of the Staffordshire Helmet**

***Pieta Greaves***

Drakon Heritage and Conservation, [pieta@drakonheritage.co.uk](mailto:pieta@drakonheritage.co.uk)

The Anglo-Saxon Staffordshire Hoard was discovered in July 2009 by a metal detectorist, comprising a mix of gold, silver and garnet items weighing over 6kg. Although fragmented, damaged and distorted, the hoard's remarkable objects represent the possessions of an elite warrior class, stunning in their craftsmanship and ornament.

Research reveals approximately a third of the fragments in the Staffordshire Hoard come from a very high-status helmet. Helmets of its kind are rare – the Staffordshire Hoard helmet is one of a very small number to be found from this period. A reconstruction of the helmet has been created, nearly 10 years since the Staffordshire Hoard was discovered, and are on public display at Birmingham Museum and Art Gallery and The Potteries Museum and Art Gallery. This paper will look at the evidence for the helmet, its construction and its function as a object of power.

## **Craft working at Anglo-Saxon Rendlesham, is this the location of the royal palace workshop**

***Eleanor Blakelock***

UCL institute of Archaeology, [eleanor.blakelock@blueyonder.co.uk](mailto:eleanor.blakelock@blueyonder.co.uk)

Around 6km North-East of the world famous Anglo-Saxon burial ground of Sutton Hoo lies the site of Rendlesham. Fieldwork at Rendlesham in Suffolk has identified a major central place complex of the early–middle Anglo-Saxon periods, hinting to the location of the 'royal settlement' mentioned by Bede in the 8<sup>th</sup> century. The assemblage was recovered during a systematic metal-detecting survey, with only limited excavation carried out. There is however a high proportion of precious metal objects and coins, along with brooch types rare in England, which all point to an elite site. Also discovered was a range of non-ferrous (gold, silver and copper alloy) metalworking waste including, scrap metal, globules of spilt metal, casting sprues and unfinished objects.

A variety of analysis techniques was used to investigate this large assemblage which included gold, silver and copper alloy objects, and related metalworking waste. This presentation will provide the first look at the metalworking assemblage from the site, providing more information about the manufacturing methods as well as thoughts and choices made by the craft workers.

## **Ironmaking in Middle Norway: Technological changes and political power in the Viking Age**

**Ole F. Nordland**

UCL institute of Archaeology

The middle Norwegian region of Trøndelag is one of the archaeologically richest regions in the country. Despite its relatively northern location, large arable areas provided the foundation for large populations, and potentially powerful leaders. During the Early Iron Age (c. 500 BC – 500 AD), large burial mounds with rich burial goods, as well as remains of fortification installations, suggest a strong local rulership and organisation. This is supported by a local, well established ironmaking tradition lasting throughout this period.

In the Late Iron Age, a new and fundamentally different type of ironmaking furnace appears in this region, effectively replacing the former one. Unlike its predecessor, this new furnace type is not as regionally limited, but appears throughout the entire country. Coinciding with its introduction, a decline and geographic shift in burial sites and settlement areas points towards a change in the political climate in the area.

## **Medieval urban metalworking – control or anarchy?**

**Justine Bayley**

Honorary Editor, Historical Metallurgy Society, Howcroft, High Street, Harmondsworth UB7 0AQ, UK, [editor@hist-met.org](mailto:editor@hist-met.org)

In 1996 the Historical Metallurgy Society ran a conference on the theme of medieval metalworking. The majority of the papers that were published later that year in its journal, *Historical Metallurgy*, related to archaeological finds from excavations in English cities. Now, over 20 years on, it seems timely to re-examine what archaeology has contributed to our understanding of the urban metal industries of the high medieval period.

This paper will review the archaeological evidence for secondary metal industries, *ie* those that converted metals and alloys that had been produced elsewhere into useable objects. Despite the large number of urban excavations carried out in advance of development in recent years, there have been few new sites where major assemblages of metalworking debris have been found. While small quantities of iron smithing slags are recorded quite frequently, there have been far fewer sites where evidence for non-ferrous metalworking has been recognised, and in those cases the process identified is usually the casting of large copper alloy vessels, either cooking pots or bells. The archaeological evidence thus gives relatively little indication of where or how the many ubiquitous small metal objects that were in daily use were produced.

Against this background, superficially little more appears to be known now than was the case over 20 years ago. However, the newly-found material adds a richness and depth to our knowledge base that can be further enhanced by comparison with documentary sources. This primarily archaeological paper is offered as an example of the contribution that studies of this sort can make to the better understanding of metalworking in medieval cities. For the future, the way forward is to consider all the available evidence, be it historical or archaeological, as the combination will almost always give a fuller picture than either can on its own.

## **Evolution in ownership of Irish ironworks in the 17th and 18th centuries**

***Paul Rondelez***

This presentation details the changing patterns in ownership of iron smelting furnaces in Ireland from the late 16th to the late 18th century, when over 150 charcoal-fueled water-powered blast furnaces were active on the island. The introduction of the blast furnace in Ireland was the work of English iron masters while in the early 17th century, ironworks were mainly built by the wealthier of Planters but also the East India Company had a blast furnace in Co. Cork. After the Civil War of the 1640s and 50s, many more furnaces were built by owners of relatively small estates, often veterans of this war. In the 18th century we see the first instances of Irish iron masters themselves taking ownership and expanding iron-making ventures. An often neglected aspect of the ownership of ironworks is the contribution of merchants who, throughout the whole of the study period, are often the financiers and at least co-owners of the works. The talk will also touch upon the managers and workers at the Irish ironworks.

## **State sponsorship of technological change in Prussian Silesia in the late 18th Century.**

***Richard Williams***

Beginning with Frederick the Great, the Prussian State instituted a plan to modernise metallurgical production throughout the kingdom from the moment Silesia became part of it in 1742. With coal available, it was specifically decided to emulate the developments that had already occurred in Britain and in the 1780s and 90s the civil service that Frederick put in place to pursue this plan progressively imported 'the English model'.

Teams of technically qualified experts were sent to Britain to study the astonishing series of developments made there over 100 years, partly using dubious techniques that could be described as espionage and bribery, but also enticing well known British iron masters to visit and help them. Even so they needed skilled men on the ground to ensure that the transplanted metallurgical techniques would work in practice.

The most influential and successful of these ex-patriates was the Anglo-Scot John Baildon, who worked for the Prussian State between 1792 and 1806 and personally had a hand in the early introductions of coke in blast furnace and remelting processes, of the manufacture of cannon and steam engine cylinders (as well as complete steam engines) and the building of iron bridges and of canal infrastructure.

The Prussian strategy was not to rely entirely on state owned production, but to use it as a means to encourage private individuals to finance further metallurgical factories, which is what happened.