

# Fieldwork on early iron working sites in East Yorkshire

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## Abstract

Fieldwork centred on Holme-on-Spalding Moor, East Yorkshire, has resulted in the discovery of an iron industry that may be the oldest and one of the largest so far found in Britain. Dating from the Middle Iron Age and continuing into the Romano-British period, this iron working is related to a former estuarine creek system and tidal inlet of the river Humber, in which the Hasholme log boat sank. It is possible that control of the iron industry and/or its associated watercourses was a contributory factor to the wealth and prestige of the Arras Culture of East Yorkshire.

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## Introduction

'Occasionally, subsoiling equipment is used to break what is known locally as a "Nossman pan". The name of this barrier to normal cultivation is apparently a colloquial reference to the tough, red-headed, invading Norseman of an earlier age, who required a whole army to defeat them at Stamford Bridge and is a graphic description of the problem in hand' (Keen 1955).

This quotation shows that workers on the land were very aware of the presence of iron deposits in East Yorkshire. The name 'Nossman' was also given to the slags and other iron working debris encountered during agricultural work, though the precise age of these deposits was not known. According to a member of the audience in an 'Animal Vegetable, Mineral' programme broadcast from Holme-on-Spalding Moor School in the 1960s, Sir Mortimer Wheeler did suggest that a piece of slag brought in to the panel might be of Iron Age date.

Large pieces of 'Nossman' were a common find in one particular field at Hasholme Hall, Holme-on-Spalding Moor, where the writer was brought up. During the subsequent excavations, primarily focused on Romano-British pottery kilns (Hicks and Wilson 1975), a large amount of slag, the base of a clay structure, possibly a smelting furnace or smithing hearth, and a Romano-British iron anvil were found near the pottery kilns (Manning 1975).

In 1980 the writer began a detailed landscape study with members of the East Riding Archaeological Society, around Holme-on-Spalding Moor. Field walking was combined with other methods of site prospection and a magnetometer survey at Hasholme Hall, undertaken by Mr J Pocock of Bradford University in October 1981, showed the presence of several possible furnaces or hearths with surface slag in the vicinity of the anomalies (Pocock 1983). Most of the iron had been completely oxidised and the slag was only weakly magnetic.

It soon became apparent that the iron industry around Hasholme and Bursea was much larger than presumed (Halkon 1983), and in 1983 field walking was combined with a programme of research and rescue excavations, undertaken in conjunction with Prof. M Millett of the University of Durham Archaeology Department. The primary aim of this project was to establish the relationship between agriculture and industry in the Iron Age and Roman periods, assessing the impact of environmental factors, such as soils and watercourses (Halkon 1987, 1989, 1990 and 1998, Halkon and Millett in press, Millett and Halkon 1988).

## Background to the landscape

The area, which lies to the west of the Yorkshire Wolds, c8 km north of the river Humber, is predominantly low-lying. Its surficial geology comprises glacio-lacustrine clays overlain in some parts by ridges of Aeolian sands rising to 8m OD. The river Foulness is bordered by carr land of peat and alluvium. Around 800-540 BC, a marine transgression led to the creation of a tidal inlet and estuarine creek system that extended northwards from the present line of the River Humber. This watercourse was to be of importance in the future development of the whole of the Southern Vale of York (Halkon 1990). The Iron Age logboat discovered at Hasholme Hall (Millett and McGrail 1987) and a now destroyed boat from South Carr Farm (Halkon 1997) provide striking evidence for the use of this watercourse in the Iron Age. The deposits around the Hasholme boat showed that the area was wooded with oak, alder and hazel providing fuel for furnace based industries during the later Prehistoric and Romano-British eras (Turner 1987).

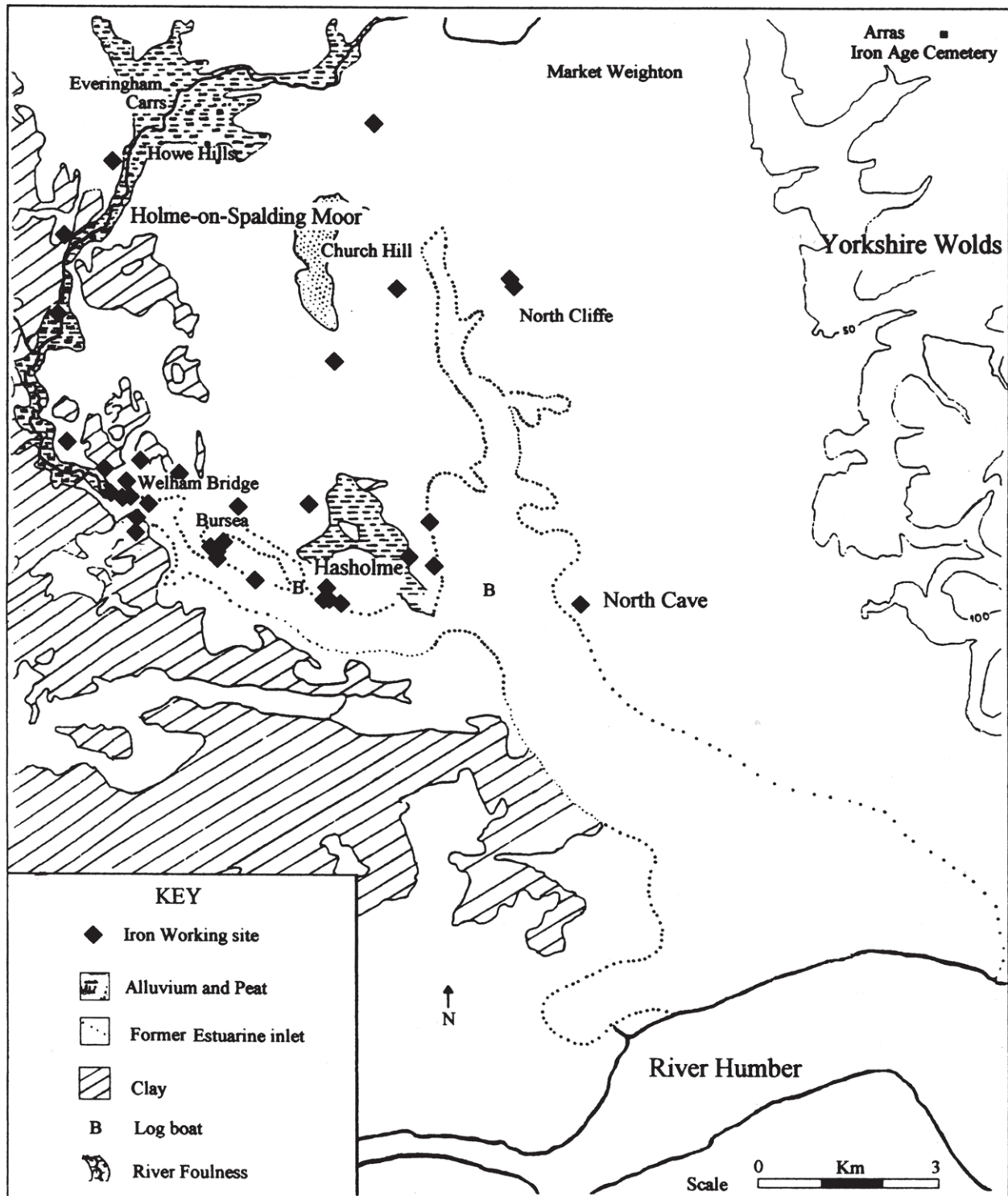


Figure 1 : Iron working sites round Holme-on-Spalding Moor, East Yorkshire

### The iron working

By 1987, debris including tap-slag, blooms, furnace and hearth bottoms and cinder had been found on 50 sites, 22 of them with Romano-British pottery but 15 of the 17 major manufacturing sites had no Romano-British pottery at all. It was noticeable that most of these sites were within easy reach of the river system (Fig 1). The sites at Hasholme Hall and Hasholme Grange, for example, were

close to the estuarine inlet in which the Hasholme Boat sank and indeed in October 1994 iron slag was found on the very edges of the creek.

During cultivation and field walking at Boursea House, several large concentrations of iron slag, some in the form of plano-convex blocks, were found, the largest of which was on a sandy ridge close to the relict creek system

(Halkon 1983). During the excavation of 1984, the base of a furnace was found *in situ* dated to the later Roman period, although it is likely that smelting was undertaken there from the Iron Age onwards.

Iron slag was also found at East Bursea Farm in several locations with and without Romano-British sherds. As iron slag was discovered stratified with Holme greyware pottery in a ditch near the site of the medieval chapel during the 1990 excavation, it appears that here also the industry continued into the Roman period.

In 1985, at Moore's Farm, Welham Bridge (SE 79303403), a large heap of iron slag was discovered during field walking, still standing to a height of 1m (Halkon and Millett in press). The whole heap was excavated and found to consist of hearth rakings and slags (Fig 2). Beneath the heap was a network of ditches and in all 5,338 kg of slag and other iron working debris was recovered. Some pieces of slag contained sufficient chunks of charcoal for C-14 dating. Two radio-carbon dates have been obtained from charcoal in slag blocks, stratified within the slag heap:

HAR-9234 2260±70 BP (450-250 Cal BC)

HAR-9235 2370±60 BP (600-380 Cal BC)

(the calibrations are expressed at the 68% confidence level, after Stuiver and Pearson 1986)

Full analysis of the slags has been carried out by Phil Clogg (in press) of Durham University and a summary of his classification is given in Table 1.

At Welham Bridge West, on the opposite side of the Foulness from Moore's Farm, a grassy bank over 50m in length was found to contain many furnace bottoms and other waste. This too was situated on the edge of the peat and alluvium associated with the river. The clustering of such sites around Welham Bridge suggests a specialist

industrial zone.

## Conclusions

The majority of specialist iron manufacturing sites were close to the River Foulness, a possible reason for this being the use of water for the transportation of finished products. Cleere (1982) has suggested that this would be the cheapest method of carriage and ready access to the Humber basin was given by a dendritic estuarine creek system. The coincidence of sites and waterways would also be explained if bog ores were utilised. Cleere (pers comm) has suggested that these would have provided excellent furnace feed stock, easier to smelt than the limey Scunthorpe ores from the other side of the river Humber. Thick deposits of bog ore have been found around Holme-on-Spalding Moor, and experimental smelting of ores from Glebe Farm, South Cliffe undertaken by Peter Crew at Plas Tan y Bwlch, Snowdonia in April 1996 showed this ore to be fairly poor but smeltable.

There was a lack of Romano-British pottery on the sites with the largest amounts of slag. The evidence from excavation shows that smelting and iron working took place in the area from the Iron Age onwards, possibly declining in importance in the Roman period. The C14 dating of charcoal in the slags from Moore's Farm also supports the writer's original hypothesis for the Iron Age origin of the iron industry. At North Cave for example, 3 km to the east of the Holme study area, furnaces and a large amount of iron slag were excavated by John Dent associated with Iron Age round houses (Dent 1989).

Given the probable contemporaneity of the Hasholme boat, the South Carr Farm boat and the iron industry around Holme-on-Spalding Moor, a relationship between it and the warrior aristocracy of the so called Arras culture is possible (Dent 1983, Stead 1979 and 1991) indeed the

Table 1: Classification of iron working debris from Moore's Farm, Welham Bridge

Group	mean radius (mm)	depth (mm)	weight (kg)	Description
Plano-convex blocks	180	170	12.5	Upper surfaces flowed texture, base globules or dribbles, little charcoal. Internal dimension of furnace 300-400mm.
Elongated convex blocks	*	245	26.6	Upper surfaces very irregular, lower surface compacted, regular curve, much charcoal. * width 373mm, length 525mm.
Large hemispherical blocks	255	386	45.75	Very regular, smooth, flat upper surfaces, deep bowl, irregular outer surfaces, large charcoal inclusions.
Irregular elliptical block	327	354	59.7	Flattened mushroom' cross section, irregular surfaces, charcoal clearly visible. Compacted and clearly defined edges - formed against vertical containing structures.

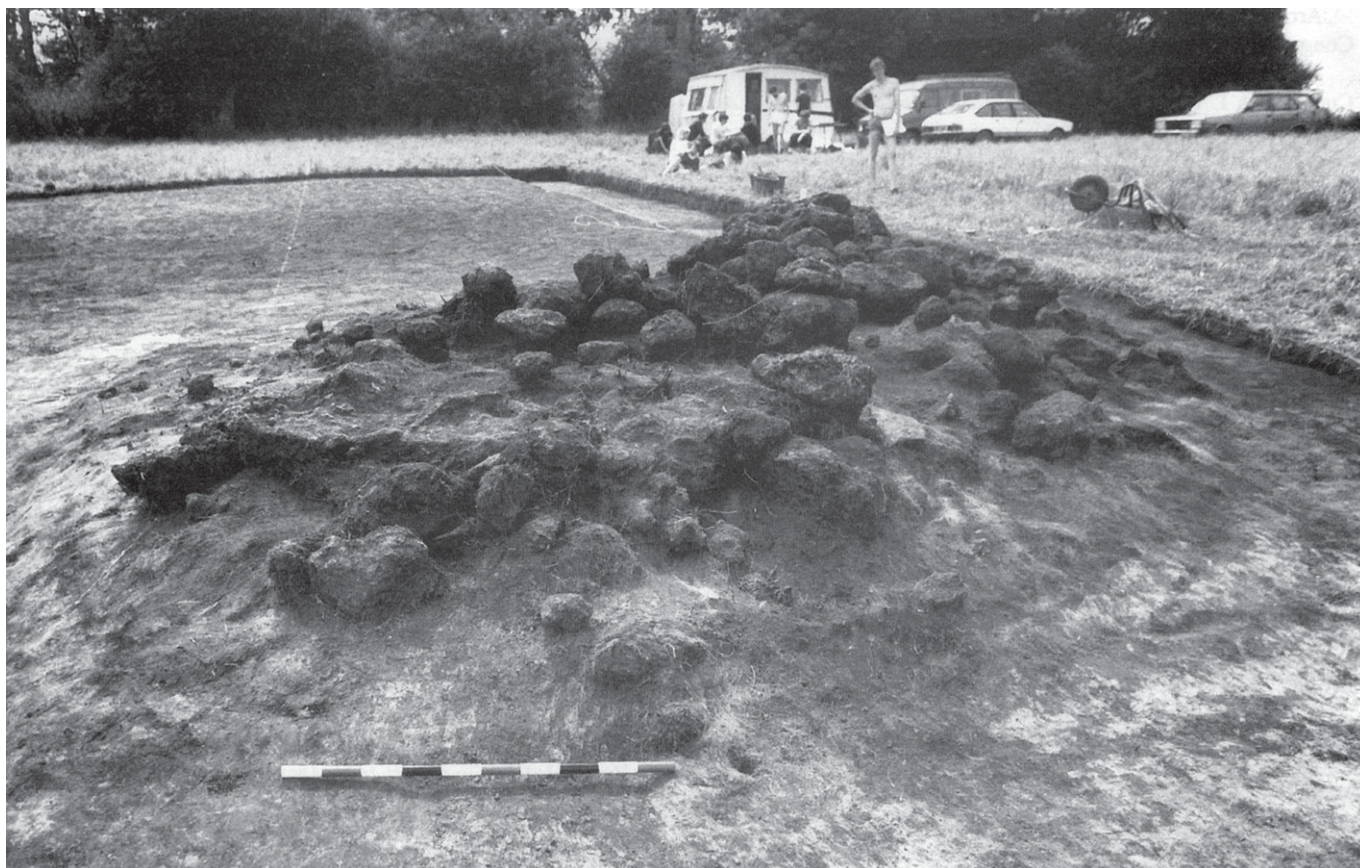


Figure 2: The slag heap at Moore's Farm, Welham Bridge during excavation.

Arras square barrow cemetery itself is situated at the head of a prominent dry valley, which provided the natural route down to the estuarine tidal inlet of the Humber (Halkon 1995). Iron was fundamental to these people, and it is likely that some of their wealth and prestige, eloquently expressed by the iron swords, mail, mirrors and harness fittings found in their chariot burials, was based on control of the creek system and iron working sites. It is interesting to note that Dr C Loveluck has recognised the importance of bog ore near Elmswell in the upper Hull valley, during the Anglo-Saxon period (Loveluck 1994). Evidence for Romano-British and perhaps Iron Age smelting is recorded there as well (Congreve 1937 and 1938) and it is tempting to consider a relationship between this iron industry and the well-known chariot burials at Garton and Wetwang Slacks. Although this has yet to be proved, it is hoped that future research will be targeted at resolving this.

The Holme project has shown the great potential for understanding the iron industry within a changing landscape, and comparative analysis and dating of finished products, especially the Arras culture grave goods, and slags from production sites and ores may shed more light on this dynamic period of Yorkshire's past.

### Acknowledgements

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