

Creating an award winning website for Community Archaeology and Research – “Valley of the First Iron Masters” - a case study (www.ironmasters.hull.ac.uk)

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Abstract

An £83k grant from the Heritage Lottery Fund (HLF) enabled the creation of an award winning interactive website based on 25 years research of a remarkable archaeological landscape in East Yorkshire, England, with finds ranging from the teeth of straight tusked elephants and Palaeolithic hand axes, to Britain's largest surviving Iron Age log boat. The region contains an Iron Age iron industry of international importance, which gives its name to our project. This paper presents an account of this website which includes GIS type maps, interactive activities and animated reconstructions, presenting information about several thousand archaeological sites and artefacts.

Categories: Archaeology, on-line teaching and learning, reconstruction.

1. Introduction

The Foulness Valley or “Valley of the First Iron Masters” as it has become known, was once home to one of Britain’s largest and earliest prehistoric iron industries, dating from around 300 BC. Other major discoveries include the 12m Iron Age Hasholme log boat, the largest survivor of its kind in Britain, contemporary with the iron industry and the chariot burials of the so called Arras Culture. There are also Roman “villas”, a Roman pottery industry and many prehistoric and medieval sites.

These finds were made as a result of a landscape archaeology project initiated by the author in 1980, with the East Riding Archaeological Society (ERAS) co-directed from 1983 with Professor Martin Millett (now of the University of Cambridge). From the onset we have striven to carry out research in a community archaeology framework. Hundreds of people including full-time and extra-mural students from several universities, school children and many volunteers from the local community have been closely involved.

Although we produced conventional interim reports [HM00; 03] and are about to publish the second in a series of monographs [HM99]; [HAL03]; [M forthcoming], the latter chiefly aimed at the academic community in order to “preserve by record” the excavated archaeology, we have been eager to transmit our work to non archaeologists.

Sponsorship from BAe Systems (formerly British Aerospace) enabled the production of a colour booklet “Valley of the First Iron Masters” and large mobile display stands consisting of graphics and text. They also provided a grant towards the academic publication. In 2000 they were awarded the Wedgwood Sponsorship Award of the British Archaeological Awards. The display boards [HA04] have been extremely popular and they (and us!) have toured schools, community groups, archaeology events and are currently on display in the Hull and East Riding Museum, (HERM) next to the Hasholme Boat. Such materials are limited in both their impact and the number of people able to view them at any one time. In 2001, the boards were displayed in the University Library at Hull where Ian Dolphin, Head of e-Services Integration saw the potential of the information presented as the basis for a fully interactive website. The website, which is now online at the above URL was the Higher Education Academy for



Figure 1: Valley of the First Iron Masters website front page

History Classics and Archaeology website of the month for February 2005 and in April 2005, won one of the three annual Vice-Chancellor's Prizes awarded for research projects across the whole of the University of Hull.

After a brief resume of the archaeological project, the rest of this contribution will provide an account of how the website was constructed, the challenges encountered and the lessons learned, which I hope will be of benefit to others planning to embark on this excellent method of encouraging enthusiasm for the past.

2. The Fieldwork - Aims, methods and results

The project has been carried out in three interrelated phases, through aerial photography, geophysical survey, palaeo-environmental investigation and excavation:

(i) *Detailed investigation of Iron Age and Roman Industry and settlement in an 8 km x 8 km landscape block around Holme-on-Spalding Moor 1980-1991*

The main discoveries included:

- The Iron Age Hasholme logboat, 12m in length with a felling date of 321-277 BC. This boat sank in a tidal estuarine inlet of the River Humber [MM84; HM99].
- One of Britain's largest Prehistoric iron industries (c 300 BC), which may be one of the factors behind the wealth and prestige of the Iron Age East Yorkshire "Arras culture" with its chariot burials. In all 18 large scale iron smelting sites were found, the slag heap excavated at Moore's Farm, Welham Bridge being one of the largest yet found in prehistoric Britain, dated from (HAR-9234) 450-250 cal BC (2 sigma) and (HAR-923) 600-380 cal BC (2 Sigma) [HAL97; HM99]. This discovery inspired the name of the current project.
- A regionally important Roman Pottery industry with over 30 Roman pottery kiln sites in a low-lying woodland area, contrasting with more "Romanised" settlements on higher better drained land.

(ii) *Examination of a Roman roadside settlement at Shiptonthorpe 1995-1991* [M forthcoming]

The main discoveries included:

- The development of a settlement plot adjacent to the Roman road including a remarkable aisled timber hall over 20m long.
- A mixture of artefacts, military, indigenous and overseas expected of a Roman roadside settlement in this region.
- Special deposits associated with a waterhole including the structured deposition of animals, human infants, shoes, writing tablets and suggested from pollen analysis, mistletoe, and holly.

(iii) *Investigation of Roman impact on pre-existing Iron Age settlement in a 3 km x 3 km block around Hayton 1993-2004* [HMETF00]

The main discoveries included:

- The impact of the Roman fort constructed at the time of the Roman invasion of Yorkshire and Roman road which caused a realignment of the Iron Age landscape.
- A Roman roadside settlement more highly Romanised than those at Shiptonthorpe or Holme.
- The development of a settlement from roundhouse to "villa" with a bath-house, the well of which contained a piece of inlaid furniture made of timber inlaid with bone and marquetry, complete with copper alloy hinges.

3. New directions - Towards a virtual landscape of the Foulness Valley

3.1 Introduction

The use of internet-based techniques for heritage interpretation has become well established, a good example being at Creswell Crags, [W04], an internationally important site in central England, where Upper Palaeolithic material has been found, including Britain's first Ice Age cave art. The award winning CD and website "Virtually the Ice Age", created there, was developed with various aims, including enhancement of visitor experience and promotion of access. Unlike Creswell, in the Foulness Valley it is not possible for visitors to see many upstanding features or structures as most of the area is generally flat arable land. Surviving earthworks are few, the only evidence visible on the ground surface being ploughed up remains such as pottery, flint artefacts and building material. Our website, therefore, provides one of the few ways by which the rich archaeological evidence underlying this rather bland intensively farmed landscape, can be visualised and brought to life in a way intelligible to a general audience. As well as providing the ability to communicate the former character of this landscape to non-archaeologists, accurate animated and interactive visualisations have also provided new insights for archaeology students and researchers. The construction of 3D easily manipulated structures has been particularly useful – trying to visualise a timber building from the postholes and foundation trenches on a 2D excavation plan can be difficult. The use of CAD and 3ds max has also shown that some reconstructions created through traditional means, even by experts, would not have stood up!

Although the "Valley of the First Iron Masters" has not been operating for long, the benefits and potential of interpretation through the internet outlined by Kreisel et al [KGD 04] in the Schöningen area of Germany, such as "multimediality", allowing integration of sound and video, are very evident. Our approach is twofold: the development of a real-time, 3D stereoscopic, full-scale representation of an archaeological region in the Hull Immersive Visualisation Environment [HIVE], an account of which appears in "New perspectives on ancient landscapes – A 3D stereoscopic Virtual Environment" [PCVH04],

presented at VAST 2004 by Julien Pansiot, and the creation of the Valley of the First Iron Masters website.

It was clear that considerable funding was needed and as the underlying fieldwork was run jointly with the ERAS, it was possible to approach the HLF, who would not usually support Higher Education projects, which are normally financed from elsewhere. After a long and complex application procedure, in March 2003, ERAS, with Ian Dolphin, Martin Millett, and the author, secured an HLF grant of £83k to develop this accessible online resource, with the support English Heritage, HERM and the East Riding of Yorkshire Museums service. The University of Hull provided matching funding, also offering to administer the project on behalf of ERAS.

Work began in January 2004, funded until December 2004, undertaken by full time web developer Richard Green and graphics developer Mark Faulkner, with text, and images supplied by the author, advised by a steering committee comprising museum staff, ERAS representatives, teachers and lecturers, under the management of the writer and Ian Dolphin with Martin Millett. The Steering Group met on four occasions throughout the year and provided extra advice and support where necessary.

As well as presenting the results of the archaeological project we were keen that the website would be a useful teaching resource for three levels of user: 'Basic' – for upper primary and lower secondary school pupils, targeted at the National Curriculum (especially History and Geography), 'Intermediate', aimed at older students and those with a general interest in archaeology and 'Research', with more detailed information, references for further reading and fewer activities, aimed principally at a Higher Education clientele. A high visibility version was also constructed for the visually impaired at each level.

3.2 The database

The whole website is driven by a database constructed by Richard Green using Microsoft Access and web pages are built 'on the fly' according to a user's settings and preferences using Macromedia (now Adobe) Cold Fusion. The dataset, largely collated by the author, comprises information and images from the Foulness Valley fieldwork and HERM, where the finds, including the Hasholme logboat, are housed. Information was also gained from the Sites and Monuments Register at Humber Archaeology Partnership (HAP), plots of aerial photographs and site details provided by the National Monuments Record (NMR), English Heritage and the Portable Antiquities Scheme (PAS).

A search tool and a conventional indexing system is provided on the website, mainly for the benefit of "academic" users; it was anticipated that less specialised users would prefer one of the interactive access routes described below.

Each site was allocated a unique identifier and located using the Ordnance Survey National Grid (OS NGR) to a

maximum of 10 figures, enabling a layered GIS approach to the presentation of the data. A problem in Britain, though improved to a large extent by the PAS, is illicit metal detecting. After taking advice from HAP's SMR and County Archaeologist, it was decided only to show grid references at 4 figures on the website pages. To protect the interests of farmers and landowners, specific farm names were also excluded for the most part, with locational information restricted to the area names within parishes. This was very much a compromise solution, as part of the mission of both the HLF and English Heritage is to widen access to archaeological information.

3.3 The interactive map

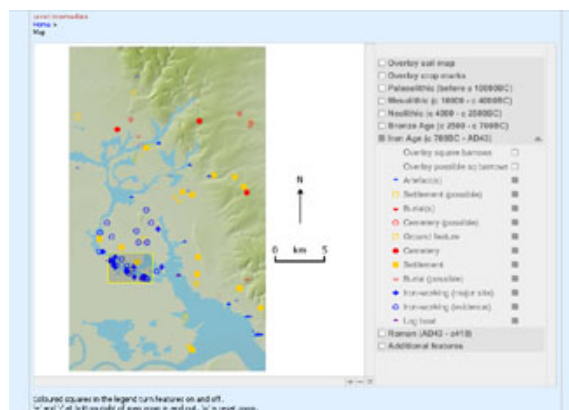


Figure 2: A screen shot of the interactive map showing the Iron Age landscape. GIS type layers allow findspots to be viewed against various landscape parameters

We were anxious to provide a variety of entry methods to the website. The main method is an Interactive map of the 30x20 km study area, available at all levels of user. For the basic and intermediate level the number of "active" data spots and the type and format of information generated when these points are "clicked" were carefully tailored to the appropriate level. The GIS based map consists of "layers" including a "3D" topographical map, a soil map, and modern locator maps, which can be switched on and off by a series of small tick boxes. Thanks to English Heritage, hitherto unpublished crop marks plots from aerial photographs also formed a layer which can be superimposed against topography and soils. A layer was also provided for each archaeological period from the Palaeolithic to Roman eras. When points on the interactive map are "clicked" the user is taken to a page of information about the archaeological site in question. Where appropriate, this page provides links to further, more detailed information about the site, a list of artefact pages for the site and a set of activity links, pointing the user to such things as animations and video clips. All pages with a textual content are scanned as they are built and a glossary of the technical terms that they contain appended below the text. The text pages contain relatively small thumbnail images of sites and artefacts which, when clicked, bring up a much larger picture in a separate window.

3.4 Themes

The “Themes” entry method provides, as its name suggests, a thematic method of navigation, covering the topics of food, clothing, shelter, wood, and beliefs, chosen partly to match National Curriculum criteria. Access is generated by clicking on a theme and then choosing a time period in which to investigate it. The database is then scanned for any entries which have matching information and the user is presented with a list of links to the appropriate sites. It is possible to compare and contrast themes in two time-periods simultaneously.

3.5 Guides

The most challenging and controversial entry mode was the use of virtual “Guides” provided for only Intermediate and Basic levels users. Three fictitious characters were devised to guide users through the landscape. Each character was carefully researched and a text produced by the author and spoken by either a drama student, or in the case of Bryn the Iron Master, a Welsh-speaking former Pro-Vice Chancellor of the University of Hull, who recorded his contribution in one take! The greeting albeit in modern Welsh, provides a reminder that in all probability, the Iron Age occupants of Britain spoke a version of Welsh. To allow maximum accessibility, we had to ensure that as much material as possible would be available through a 56k modem which was severely limiting. The spoken text was accompanied by a series of still images allowing further exploration of the site. Bryn’s tour is based around the evidence for the Iron Age iron industry in the region.

Marcus Falconius, a fictitious centurion from Pannonia, provides a tour of the Roman fort at Hayton, based on evidence from Stephen Johnson’s 1975 excavation and our more recent fieldwork. He also explains his military equipment. This was directly targeted at the National Curriculum. Marcus Falconius also provides an introduction to the Roman invasion of the area within its wider regional context. Much of this was based on very new evidence about the conquest of East Yorkshire. The

final guide, Marcella, is the wife of the owner of the Roman settlement at Hayton excavated as part of the fieldwork project 1995-2001 who shows off her new bath house (Figure 3). [View animation:](#)



3.6 Reconstructions

A key component was the creation of animated and static reconstructions by Mark Faulkner using Discreet 3ds max. The reconstructions were as photographically real as possible and much time and effort was spent in producing authentic textures. Visits were made to various locations such as the Brigantia Iron Age Village near York and Arbeia Roman fort to photograph “textures” to add to 3D scenes. The Ancient Technology Centre at Cranborne supplied material and animals grazing on convenient green hillsides, were photographed and placed within virtual reconstructions to add realism. Moving figures were included in 3D reconstructions by “green screening”, giving an opportunity for more community participation, as members of ERAS, dressed in Iron Age and Roman costumes, were videoed in the HIVE. Perhaps the most impressive reconstruction and an important piece of research in its own right, was the Roman aisled building at Shiptonthorpe. We were very keen to allow the excavated evidence to be compared directly with reconstructions and



Figure 3: Reconstruction of the Roman bath-house at Hayton. This is based very closely on the excavated foundations. “Marcella” is a member of ERAS who helped in the original excavation, dressed in Roman costume, “green-screened” and incorporated into 3ds max (Graphics: Mark Faulkner).

both the Shiptonthorpe aisled building and Roman bath house at Hayton “grew” out of either excavation plans or site photographs.

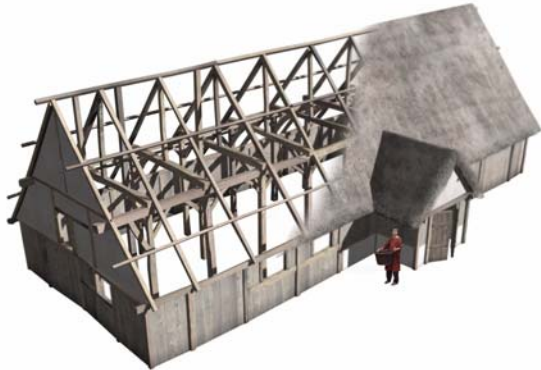


Figure 4: Still from animated reconstruction of the aisled building at Shiptonthorpe. This grows from a plan of the excavation. (Graphics: Mark Faulkner). [View animation:](#)

The most ambitious animation was a fly-through of the landscape around Hasholme in c 300 BC, the time that the Hasholme log boat was in use. [View animation:](#)

To create this, information from soil maps, aerial photography and other palaeo-environmental research was brought together and care was taken to try to match the species of trees and plants in the reconstruction with those detected in pollen analysis. Other animations included a

Roman pottery kiln, based directly on an excavated example and an iron smelting furnace. Using a combination of our own research and experimental production of iron by Peter and Susan Crew of the Snowdonia National Park, the furnace animation shows the various stages of iron production with a spoken text. This accompanies a video of one of the Crew’s experimental smelts. [View animation:](#)

3.7 Artefacts

Posting of pictures of artefacts by museums on websites is now commonplace and by agreement with HERM and the Yorkshire Museum a representative range of artefacts from the prehistoric and Roman periods were taken by Hull University photographer Mike Park. As well as still images, some artefacts were filmed on a turntable providing an all round view (Figure 5).

The largest artefact yet found in the landscape block is the Hasholme log boat and an animated sequence showing the component parts of the vessel and how they fitted together was produced (Figure 6).

[View animation:](#)



Figure 5: *Artefacts page containing picture of artefact, description and locator map.*

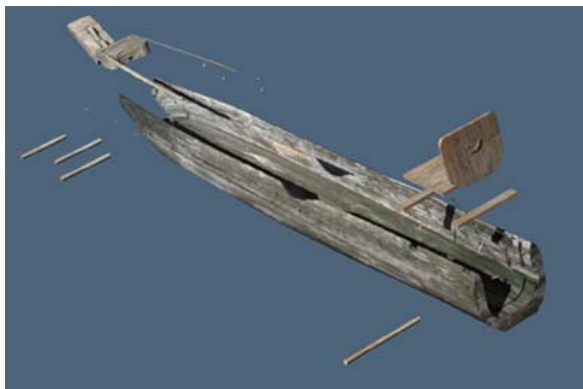


Figure 6: *“exploded” reconstruction showing component parts of Hasholme Boat (Graphics: Mark Faulkner).*

The website also provided a medium for disseminating new research prior to publication, one of the most notable contributions being from Krish Seetah (Grahame Clark Laboratory, University of Cambridge), who has reassessed some of the animal bone found within the landscape in the light of his study of Roman butchery techniques.

4. Conclusions, lessons learned and future plans

The website, launched at events at HERM and the HIVE by Julian Richards of the BBC’s “Meet the Ancestors” programme, was completed to budget and on time. The construction of such a site within a year was very demanding. We found that the amount of archaeological data within the landscape block was so large that in the end only prehistoric and Roman layers of information, sites and artefacts were included. The writing of the text for all the site and artefact descriptions also proved to be very time consuming and we also reduced the number of animated reconstructions.

The main challenge was the need to balance fast download times against image quality as we could not presume that all users had access to broadband. This had an effect on the quality of some of the map layers which pixellate when zoomed too far. Few people have experienced problems with the website which works best on a broadband connection, though it will work on a 56k modem. Users with standard dial-up connections may

experience slower load times and some degradation of streamed media content.

Feedback has been generally positive. The site has been used by all the groups it was intended for. The inclusion of school teachers as well as University staff on our steering panel was particularly useful. The online quizzes and the interactive map proved particularly popular in schools and according to teachers school students were genuinely interested by the archaeology in their locality, which was one of the main aims of the whole project. They are after all going to be the future custodians of this vulnerable past landscape.

The website has been used for undergraduate teaching and research. The interactive map worked surprisingly well on the data projector, the GIS type layers showing site distribution against soils or topography. At the moment however it is necessary to re-click the small coloured box for the period you are investigating to refresh the map for the period you were exploring. The animated Roman pottery kiln and iron smelting furnace were very useful and a great advance on still images for explaining this process.

Although some specialised help will be needed in future updates, especially additional graphics, the interactive map and underlying database have been designed to enable members of ERAS to enter new data and images as new discoveries are made. Although the content is specific to the Foulness Valley, the structure of the site and its functionality make it transferable to any area. As computer technology advances it will no doubt be possible to present information in even more complex and adventurous ways, but as it stands we hope we have enabled greater appreciation of the rich archaeology of this region far beyond the scope of the display boards and booklets which inspired the creation of this website.

The £4,000 Vice-Chancellor’s prize won by the team who constructed this website is already being put to good use in producing further reconstruction of the inlaid Roman furniture from the well at Hayton and further fly-throughs to bring new life to this ancient landscape.

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*Cutaway reconstruction of Roman bath house at Hayton.
“Creating an award winning website for Community Archaeology and Research”, Peter Halkon*