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Edited by

Graeme JR Erskine, Piotr Jacobsson, Paul Miller and Scott Stetkiewicz

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Introduction

Paul Miller, Graeme Erskine, Piotr Jacobsson and Scott Stetkiewicz

The Proceedings of the 17th Annual Iron Age Research Student Symposium, University of Edinburgh, 28 May – 1 June 2014

Since its conception in 1998, the Iron Age Research Student Symposium (formerly 'Seminar') has provided postgraduates in the archaeology of Iron Age Britain an opportunity to present their current research in a friendly atmosphere. During the course of both formal seminars and informal outings (such as field trips, dinners, and the traditional pub quiz), the Iron Age Research Student Symposium (IARSS) gives students the ability to discuss their research with colleagues and peers, in addition to a number of outstanding lecturers and professors in Iron Age studies. Previous proceedings volumes (Davis et al. 2006; Humphrey 2003; Sterry et al. 2010), also offered participants the prospect of publishing their seminar paper. As a result, IARSS has become a fixture in the development of new academics while at the same time contributing fresh perspectives to Iron Age dialogues.

In many ways, the 17th IARSS reflected its predecessors. Over the course of four days, participants presented nearly thirty seminar papers, competed in the traditional pub quiz at Teviot Row House, and enjoyed the closing IARSS meal. Nonetheless, the 17th IARSS stood out in the minds of many participants of previous Symposia, in part due to the implementation of breakout sessions and panel discussions. These new features allowed the participants to engage directly with the ideas brought forth in each session, providing both the audience and the presenters a chance to collaborate. This opportunity to collaborate was essential to the 17th IARSS, which highlighted interregional cooperation and interdisciplinarity. Interdisciplinarity was highlighted by the pre-symposium visit to the Scottish Universities Environmental Research Centre (SUERC) ^{14}C and AMS facilities, as well as SUERC's Professor David Sanderson's keynote lecture on application of Optically Stimulated Luminescence (OSL) dating technique to the problems of Iron Age geoarchaeologies world-wide.

The 17th IARSS in Edinburgh also benefited from a broad geographic scope. Papers on the Iron Age in Estonia, the Balkans, Corsica, Sardinia, Austria, Germany, Spain, France, and Italy complemented the typically British focus of the Symposium. The first keynote of the Symposium, by Dr Manuel Fernández-Götz (Edinburgh), on the evidence for migration in the Aisne-Marne and Hunsrück-Eifel regions of modern-day eastern France and western Germany, is accompanied within this volume by papers of Scott Stetkiewicz (Edinburgh), Cristina Manzaneda Martín (Alicante), Dr Paul Miller (Edinburgh), and Dr Katja Winger (Freie Universtität Berlin). In addition to the broader settings of the seminars and the proceedings volume, the 17th IARSS were headed by session chairs whose areas of interest were similarly interregional, including Dr Alžběta Danielisová (CAS Prague) and Prof Christopher Pare (Mainz).When addressing Britain and Ireland, the 17th IARSS paid considerably more attention to the Iron Age in Scotland and northern England than the previous Symposiums. Of the sixteen papers in this volume, ten feature Irish or northern British archaeology, reflecting the continuing deconstruction of the old narratives of the British Iron Age, with their traditional southern English focus. The field trip of the final day of the Symposium to Traprain Law and the Chesters Hillfort further highlighted the Scottish setting of the 17th IARSS. Fraser Hunter (NMS) guided a comprehensive tour of both sites, with his personal excavation experience on Traprain offering an illuminating account of both the history of the site and the lesser-known secrets of its remains. By tangibly connecting several seminar themes with real Iron Age sites, participants were able to enjoy a more holistic understanding of the research presented at the conference.

This proceedings volume is organised thematically rather than by region. Similar to the Symposium itself, this volume begins with Dr Manuel Fernández-Götz's paper on migration. Dr Fernández-Götz revisits this concept through the lens of combining the palaeoclimatic records with the discussions of classical writers on the subject of instability among the Celtic communities north of the Alps. In doing so, his paper contributes to the growing body of research on human-environment interactions that go beyond climatic determinism. This paper is then followed By Alexandra Guglielmi's (UC Dublin) summary of the evidence for pre-Roman and Roman Iron Age activity at Lagore crannog in Ireland. This work demonstrates that the site was in use before the construction of the crannog itself and also forces a renewed set of questions on the continuity of Iron Age traditions and hence acts as a counter-point to Dr Fernández-Götz's change-oriented argument. This tension between change and continuity is then given a very different guise in the succeeding paper on Roman mortaria in Cumbria, by Jennifer Peacock (Worcester). Peacock demonstrates just how implausible it is to assume the functional continuity of the mortaria between heartlands of the Roman Empire and Cumbria. The theme of interaction between different values or communities concludes with Helen Chittock's (Southampton/ British Museum) paper on the role that pottery forms from earlier periods may have played in the Arras culture of eastern Yorkshire.

The next group of papers turns to material culture in its own right and how objects bind together categories, enable social interaction and control technical choices. Dr Anna Lewis (Leicester) writes about equine imagery on terrets, showing how these objects transgress boundaries between the practical and the symbolic. Yvonne Inall (Hull) focuses on martial burials. On the specific level her contribution points out the importance of taking into account the defensive equipment, such as shields, as well as offensive weaponry whenever discussing these features. On a broader level, Inall's paper demonstrates the entanglement of the various objects used in the performative nature of the martial burial rite throughout Britain. The final paper of the group, by Scott Stetkiewicz (Edinburgh) explores variation in socio-technical choices as evidenced by ferrous slag in Scotland, England, and France.

The third theme of this proceedings volume is concerned with the built environment. The papers by Cristina Manzaneda Martín, Dr Paul Miller, Michael Stratigos (Aberdeen), Nick Garland (UC London), Dr Katja Winger, Simon Wood, Jonathan Horn, and Murray Cook et al. encourage the reconsideration of how built structures are identified or interpreted. Manzaneda Martín evaluates the creation of cave sanctuaries by the Oretani of south-central Spain and explains how both the built environment and collective memory reveal a common, cultural ideology based in ritual and élite status. Miller reconsiders evidence for Villanovan-period building techniques in central Italy, identifying changes in construction techniques between structures of the Final Bronze Age and the Early Iron Age. Stratigos notes the effects loch drainage has had on evidence for crannogs, and argues that, with significant, man-made alterations to the landscape, archaeologists have under-identified crannogs in eastern Scotland. Garland re-examines the classification of oppida and other enclosed structures in Britain. Following Garland's re-examination of British enclosures, Winger reports on the E.ON excavations at Manching, identifying new settlement areas of the oppida, as well as a new location for one of the major roadways through the oppida. Similar to Garland, Wood reviews the classification system used to identify Scottish hillforts, meanwhile acknowledging that, without re-categorisation, archaeologists will fail to recognise the complex differences in enclosures throughout western Scotland. Horn, too, focusses on Scottish hillforts, discussing the possible methods for creating a more robust chronology. Lastly, Cook, Watson, and Cook identify how vitrified hillforts were created, displaying how different methods of destruction are the likely causes through differing case studies in Stirling and Aberdeenshire.

This proceedings volume, through the three themes mentioned here, accomplishes two things. First, it provides an accessible survey of emerging concepts, ideas, methods, and fieldwork that will shape future study of the Iron Age. Second, it is an outline, not just of what the 17th IARSS accomplished, but also of a broader scheme envisioned by the organisers for future events in this Symposium series. It is the

(perhaps wide-eyed) expectation of the organisers that the IARSS can and should expand to offer further opportunities to research students of the Iron Age, and they firmly hope that this volume aids in the promotion of this annual Symposium, as well as the ideas of the contributing authors.

Organising a symposium of this size and scope depends on more than the organisers themselves, but on the aid and coordination of numerous individuals and institutions. Foremost, the organisers would like to express our gratitude to the sponsors of the 17th IARSS. Without their generous support, our attempts to make this IARSS more interdisciplinary and interregional would have been impossible. With their sponsorships we were able to offer speakers who would otherwise not been able to attend the conference due to distance, funds, or both the chance to attend, thus demonstrably broadening the scale of the Symposium. Our thanks to:

- University of Edinburgh Institute of Academic Development;
- University of Glasgow College of Science and Engineering;
- SUERC ^{14}C laboratory;
- The Prehistoric Society;
- The Society of Antiquaries of Scotland;
- National Museums Scotland;
- British Archaeological Job Resources;
- Historic Scotland (now Historic Environment Scotland) and;
- AOC Archaeology.

In addition, the organisers offer their sincerest thanks to the both the School of History, Classics and Archaeology at Edinburgh University and the Scottish Universities Environmental Research Centre for being supportive hosts. Acknowledgements are also due to the session chairs: Dr Alzbeta Danielisova, Dr Melanie Giles (Manchester), Dr Martin Goldberg (National Museums Scotland), Dr Peter Halkon (Hull), Dr Derek Hamilton (SUERC), Dr Fraser Hunter (National Museums Scotland), Dr Christopher Pare, Dr Rachel Pope (Liverpool), and Dr Tanja Romankiewicz (Edinburgh), as well as our keynote speakers, upon whom the organisers so heavily relied. The newly added breakout sessions and panel discussions would never have succeeded without their contributions and leadership. Finally, many thanks for all of those who participated in the 17th IARSS, either as speakers, poster-presenters, or volunteers. We hope that the 17th IARSS will be fondly remembered as thought-provoking and innovative for years to come.

Revisiting Migrations in Archaeology: The Aisne-Marne and the Hunsrück-Eifel Cultures[1]

Dr Manuel Fernández-Götz
University of Edinburgh

Reassessing Migrations: The Baby and the Bathwater

Migrations – movements of a population from their place of origin to settle in another location – are as old as humanity (Demoule 1989; Manning 2005). What is more, we could say that the mobility of individuals and groups is one of the constant and defining characteristics of European history from prehistory to the present. Why, then, have migrations suffered such a poor press in archaeological research over recent decades? The answer is mostly found in the history of research, and in particular in the manipulation of migratory interpretations for nationalist and racist ends during the early twentieth century. These abuses reached their peak during Nazism, when military conquests were frequently depicted as the 'recovery' of ancestral German territories (Olivier 2012).

After 1945, and particularly with the advent of the New Archaeology, migrations came under heavy criticism, becoming a virtually taboo subject for many archaeologists. This reaction has been perfectly summarised by Kristiansen (1998: 315), who shows that each stage is a product of its time:

> Just as the old parallelism between cultural change and migrations was rooted in a modern notion of national and political history, with cultures and migrations replacing nations and battles, so it can be argued that the prevailing parallelism between social change and peaceful internal development is rooted in post-World War II decolonisation and the development of modern middle-class welfare society.

Recently, a new trend is visible in archaeology, with renewed interest in the study of migrations in particular (Anthony 1990; Burmeister 2000; Demoule 2006; Prien 2005) and of mobility in general (Leary 2014); this is at least partly related to the development of new analysis methods such as strontium isotopes and DNA studies (see Scheeres *et al*. 2013 for a recent approach to the Iron Age record).

Obviously, criticisms of migrationist models were important in their day, by demonstrating both the over-simplification and flawed nature of numerous traditional interpretations and the many possible alternatives (for example elite exchange, trade and matrimonial alliances). Yet, it would be wrong to underestimate the existence and impact of past population movements. That the Huns threatened Rome, that the Visigoths reached the Iberian Peninsula or that the Vandals established a kingdom in North Africa are historical facts and not constructs arising from nationalist movements of the nineteenth and twentieth centuries; the way these events have been portrayed or manipulated is another matter. After decades of being discredited, it is time for a reassessment of migrations, although this does not mean resuscitating the interpretations of the early twentieth century. For the Iron Age we have, for the first time in European prehistory, written evidence about these phenomena, which means we cannot and should not avoid questions of this kind (Kristiansen 1998).

'Migration' is a broad concept that in principle covers any movement of population, from entire groups

[1] Many of the arguments developed in this article can be found in Chapter 5 of my book *Identity and Power: The transformation of Iron Age societies in northeast Gaul* (Amsterdam University Press, 2014).

on a large-scale to small segments. Although an attempt can be made to observe certain patterns in migratory processes, the specific motives and modalities take very different forms: from localised movements within the same area to long-distance migrations from one continent to another; from voluntary migrations (such as that of the Helvetii) to others that were imposed (exile of the Jews in Babylon); from individual movements to mass polyethnic undertakings that brought together different populations (such as the migration of the Cimbri and the Teutones), through an almost endless range of possibilities extending from groups of young people leaving their communities in rituals such as the *ver sacrum*, the establishment of warrior elites, newly married spouses leaving to form a new household, the emigration of entire family groups, specialist craftsmen, or tradesmen leaving to set up an *emporion*.

In the light of the vast array of possibilities, it is hardly surprising that some attempts have been made at systematisation in an endeavour to impose some kind of order on this bewildering complexity (Figure 1). Anthony (1997), for example, offers a typology of migrations that can be of some help: local migration, circular migration, chain migration, career migration and coerced migration. Prien (2005), for his part, identifies four phases in any migration process: contact/exploration phase, migration phase, establishment phase and reverse current phase.

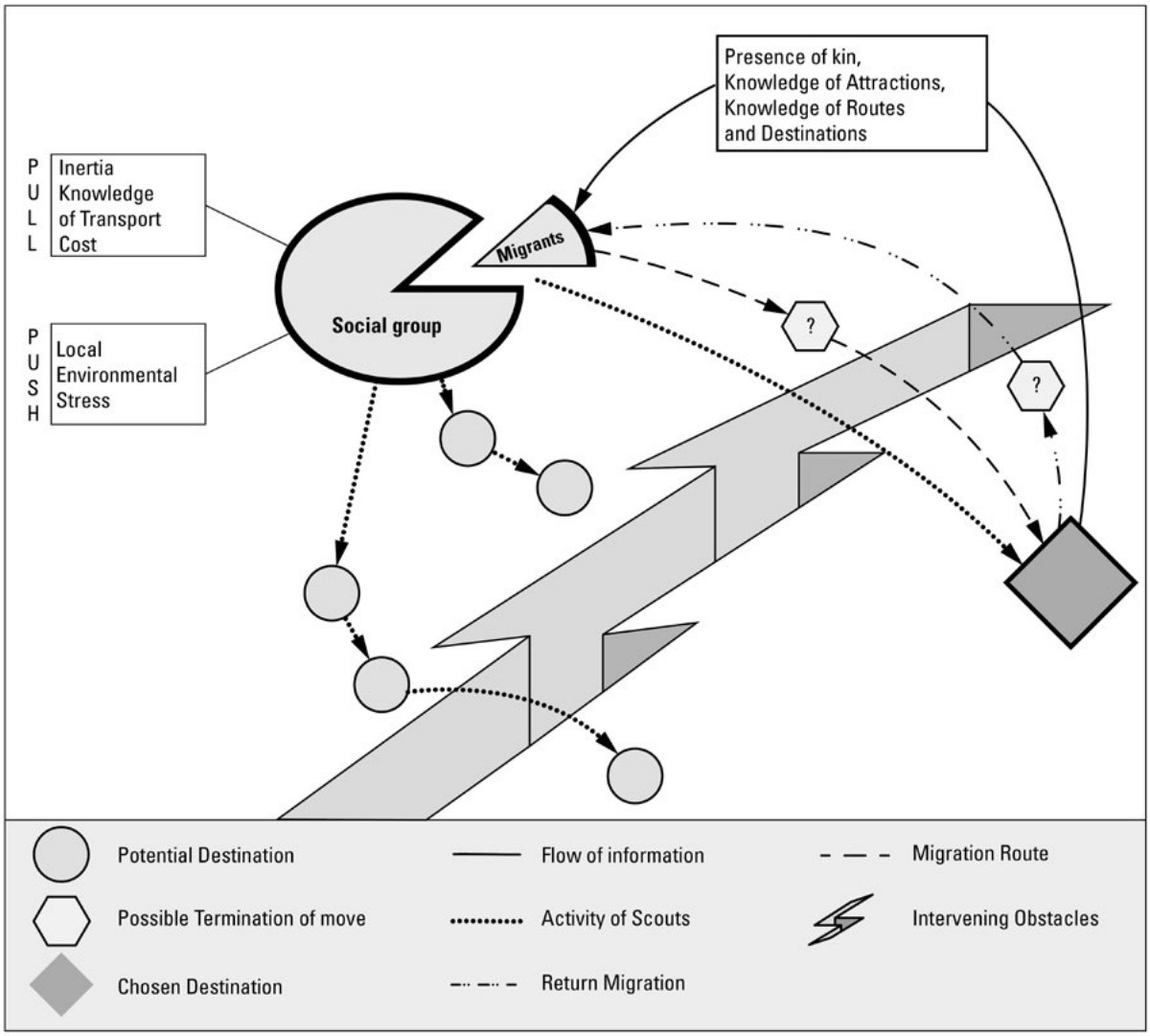

Figure 1: Diagram of a migratory process (Modified from Anthony 1990: fig 1).

It is important to note that migrations are frequently not unidirectional, but accompanied by waves of *return migration* (Anthony 1990; Burmeister 2000). In addition, and since societies rarely emigrate in their entirety, migrations generally imply a selection that is usually based on criteria of social identity such as gender, age or social class, aspects that can determine who emigrates and who stays behind. Thus, migrant groups frequently consist mainly of young people, more willing to take risks and more in need of carving out a future. Finally, migration is always a symptom, not a primary cause, and therefore must be explained within a broader framework of social organisation, contradiction and change (Kristiansen 1998).

Apart from exceptions that respond to specific historical circumstances (such as a war or sudden natural catastrophe) migrations are usually undertakings that involve a more or less prolonged planning stage, which can include elements such as the preliminary debate leading to the decision to emigrate, selection of the emigrants, gathering knowledge about the destination and the routes that will be taken to reach it, making pacts with other groups in order to guarantee the project's successful outcome, etc. One of the best known Iron Age examples is the expedition of the Helvetii, whose preparations extended over several years, according to Caesar (*BG* 1.3.1-2):

> They determined to collect what they needed for taking the field, to buy up as large a number as they could of draught-cattle and carts, to sow as much corn as possible so as to have a sufficient supply thereof on the march, and to establish peace and amity with the nearest communities. For the accomplishment of these objects they considered that two years were sufficient, and pledged themselves by an ordinance to take the field in the third year.

Towards New Lands: The Champagne – Italy Connection

Following this overview of migrations, I will now discuss two specific Iron Age case studies which provide evidence of population movements: the Aisne-Marne Culture of the French Champagne and the Hunsrück-Eifel Culture of the Middle Rhine-Moselle region, with special focus on the latter (see summary in Fernández-Götz [2014], with further references).[2] Both regions witnessed increased social hierarchisation during the fifth century BC, which led to the erection of some of the most notable graves of the Early La Tène period and (in the case of Hunsrück-Eifel Culture) of a series of important fortified hilltop centres (Figure 2).

With more than 200 examples corresponding to the beginning of the Early La Tène period, Champagne has the greatest concentration of chariot graves of the entire 'Celtic' world (Demoule 1999; Diepeveen-Jansen 2001). However, around 400 BC or shortly afterwards, a sharp demographic decline occurred, which suggests a massive exodus of the local population. The exhaustive tables published by Charpy (2009) leave no doubt about the decline in population: the number of cemeteries that were used during the second half of the fifth century BC is 162 (excluding doubtful cases), compared to only 36 with evidence from the first decades of the fourth century BC.

These demographic changes have generally been linked with the so-called 'Celtic migrations' described in the Classical sources, and above all with the movement of transalpine populations to the Italic Peninsula (Kaenel 2007; Schönfelder 2010; Tomaschitz 2002). As Evans (2004: 227) summarises:

> The depopulation of the region can be directly linked to the Galli/Keltoi migrations discussed in the classical histories. The temporal association is clear, similar artefact styles appear in the Italian peninsula at about the same time […], and it is obvious the populations described by the classical

[2] Obviously, many other examples could be found where migrations do not constitute the most likely explanation; the present focus on the Aisne-Marne and the Hunsrück-Eifel Cultures should be understood as a conscious selection made in order to re-integrate migrations into narratives of cultural change in Iron Age studies.

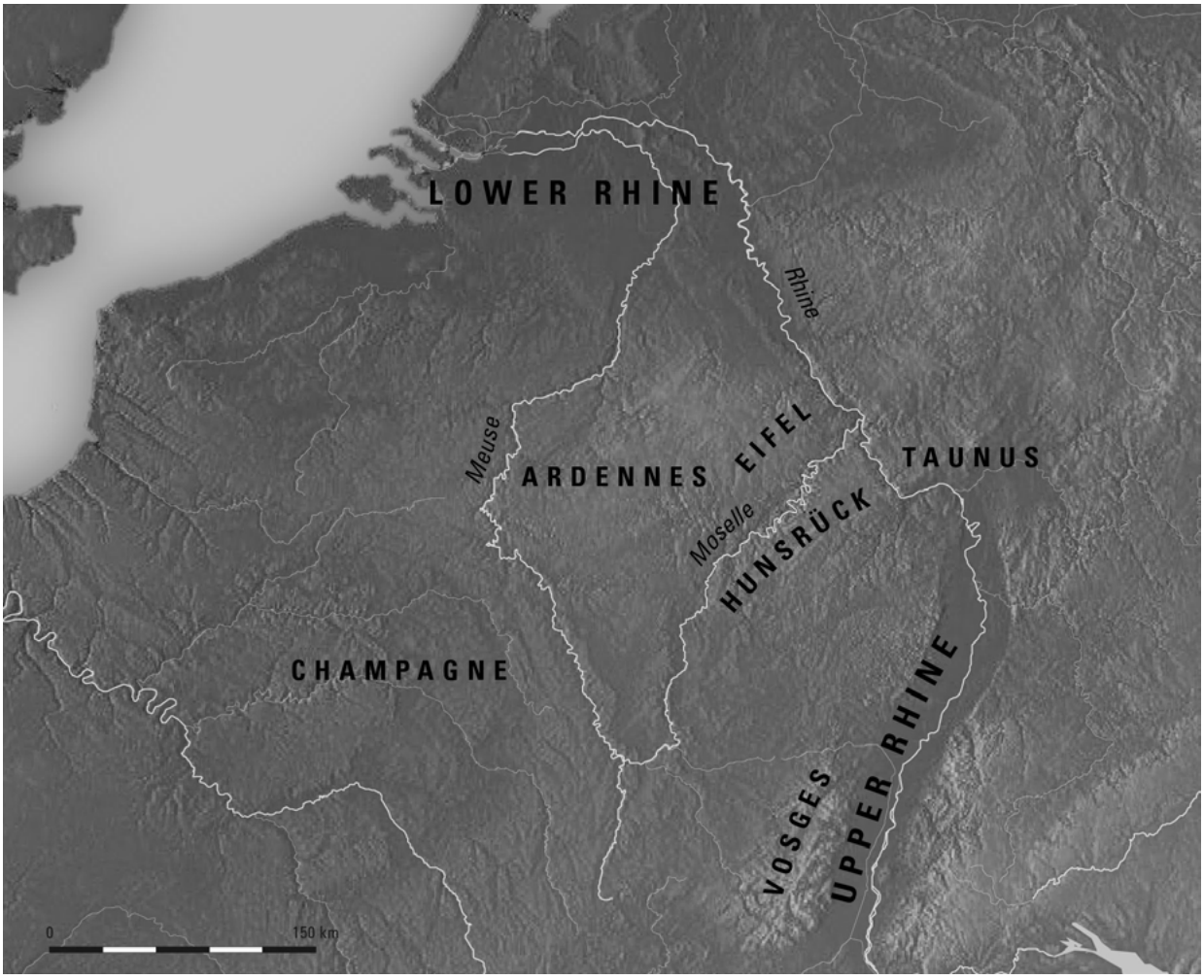

Figure 2: Physical map of the main area covered by the study, with indication of the Champagne, the Belgian Ardennes and the Hunsrück-Eifel region (after Fernández-Götz 2014).

accounts came from somewhere. The association between the two events may not be absolute, but the correlation between the events creates a reasonable hypothesis (Figure 3).

The displacement of a considerable part of the population of the Champagne to new lands would thus seem certain; rarely in protohistory do we find such a clear correlation between migrations mentioned in the written sources and archaeological data. However, it should be said that the territories of Aisne-Marne were never completely 'deserted', and some continuity can occasionally be seen in the cemeteries of specific areas, such as Beine-Suippes.

In the nearby Belgian Ardennes there seems to have been an almost complete absence of population or at least a significant demographic decline for much of La Tène B, and elite burials are certainly absent (Anthoons 2009; Cahen-Delhaye 1998). It was not until the third and early second centuries BC that certain cemeteries were used again, with some occasional chariot tombs such as that at Sberchamps. On occasion, the decline in archaeological data in La Tène B has been postulated as the result of the population emigrating to east Yorkshire, giving rise to the chariot burials of the 'Arras Culture' (Anthoons 2007; Halkon 2013). Be that as it may, the hypothesis that at least part of the population of the Belgian Ardennes may have emigrated is fairly plausible, regardless of their destination.

From Centralisation to Decentralisation: The Hunsrück-Eifel Culture

Moving on to the Hunsrück-Eifel area, the process of hierarchisation and centralisation came to an end during the course of the fourth century BC. Although establishing a precise chronology for the turning point is still difficult, the total number of documented sites belonging to La Tène B2 and La Tène C is certainly much lower than in the immediately preceding stages, as reflected in the abandonment of numerous cemeteries and the decline of the large hilltop centres (Fernández-Götz 2014: Chapter 5) (Figure 4). The decline in population is attested not only in the archaeological record, but also by pollen data from the Eifel *Maare*, which is of major importance for explaining the phenomenon. In fact, for the Middle La Tène period the pollen diagrams testify to an incontestable reduction in the intensity of farming and an increase of arboreal pollen (Dörfler *et al*. 2000).

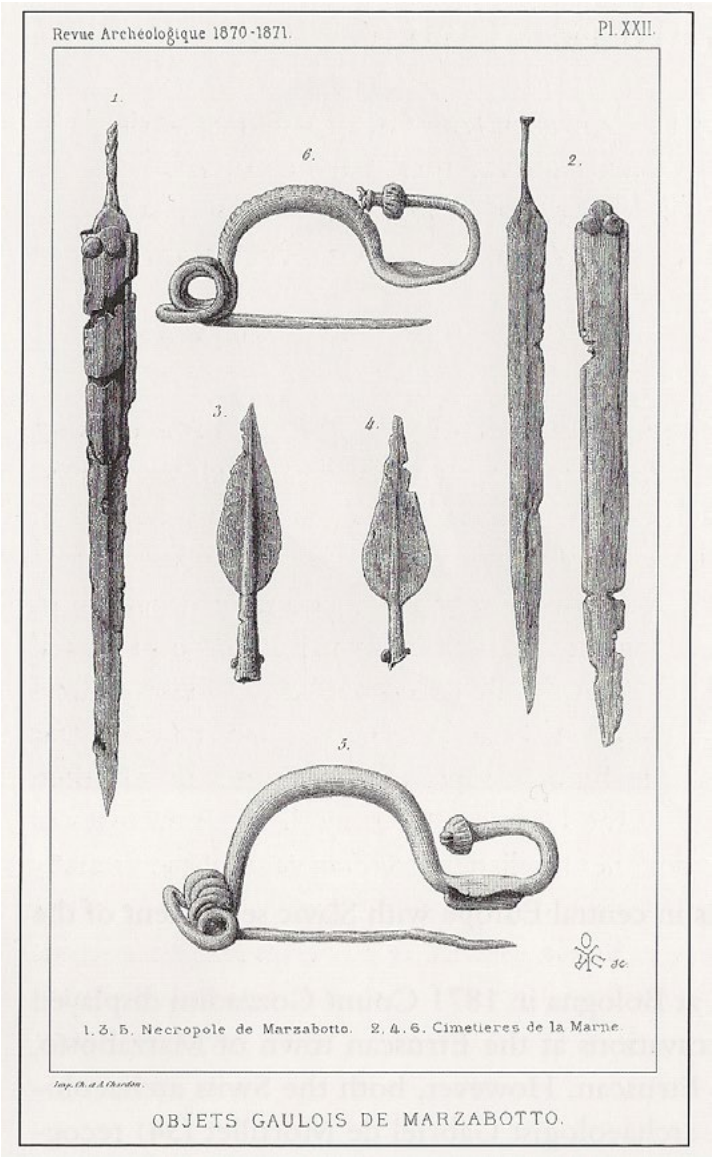

Figure 3: Comparison between Late Iron Age objects found in Marne (France) and Marzabotto (Italy) (after Mortillet 1871).

The notable decline in settlements and burials observed in the Hunsrück-Eifel area during the period analysed here has been interpreted in very different ways. On the one hand, there are explanations which relate this process with the exodus of part of the population at the time of the so-called 'Celtic migrations'; and on the other, interpretations that support a basically uninterrupted evolution of the population, attributing the lower figure of documented sites to factors associated with the visibility of the record (eg. Diepeveen-Jansen 2001). Both currents of thought have support, so until recently it was difficult to favour one over the other. It was not until the publication of the pollen diagrams mentioned above, showing a clear reduction of human activity during the Middle La Tène period, that the pendulum once again swung in favour of discontinuity.

Although changes in funerary practices (eg. the widespread adoption of cremation and the decline in the custom of erecting tumuli) certainly reinforce the image of population decline, they do not entirely explain the reduction in archaeological evidence. Thus the fundamental element was the demographic decline produced by the exodus of large contingents of the population within the framework of the migrations of the fourth-third centuries BC. By way of synthesis, the arguments that support this interpretation can be summarised in four points: 1) the decrease in archaeological evidence; 2) the

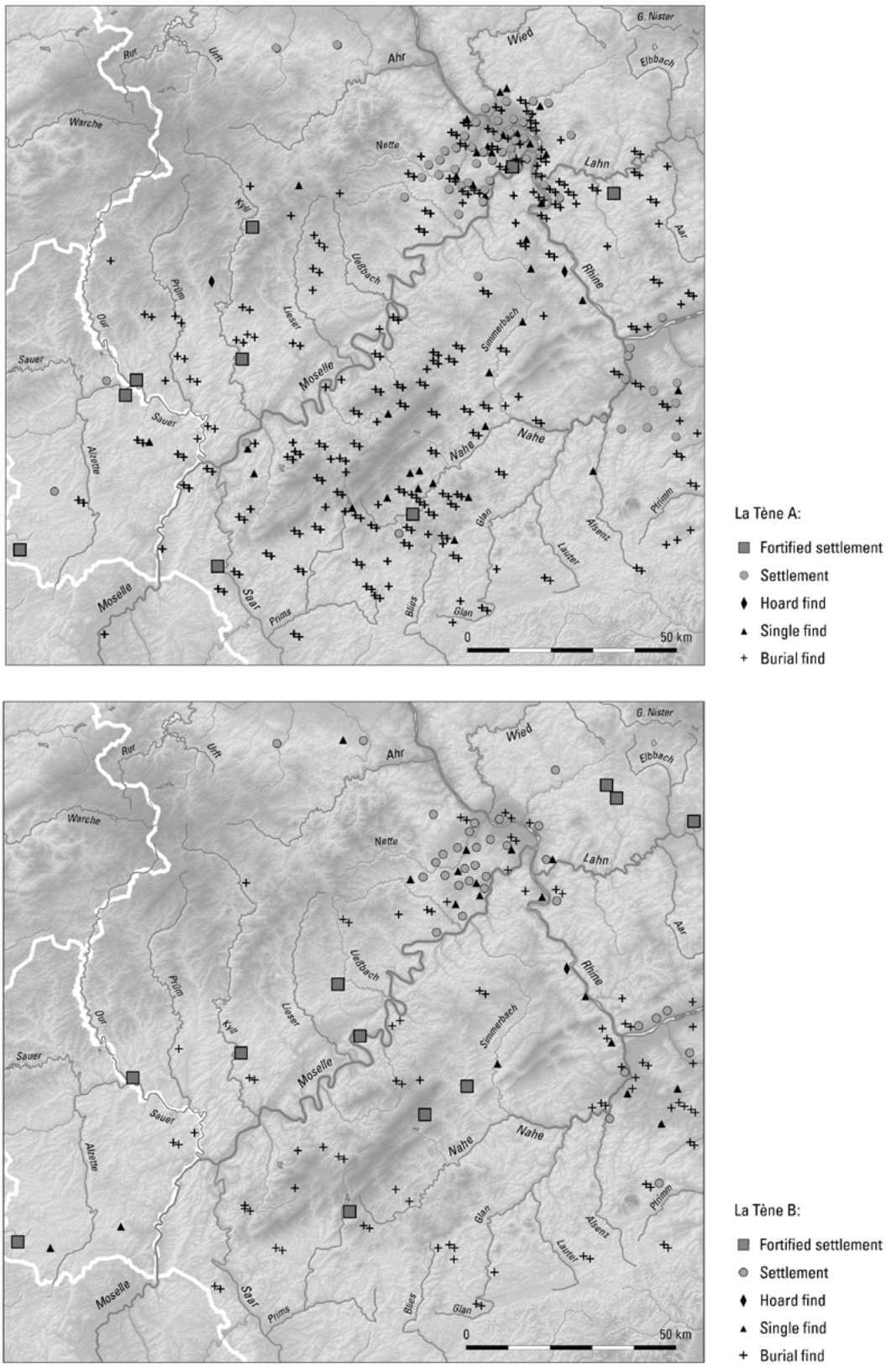

Figure 4: Sites of the La Tène A, B, C and D periods in the Hunsrück-Eifel area. The distribution maps clearly reflect the fall in population during La Tène B –here the decline appears to have occurred mainly in La Tène B2– and La Tène C (after Fernández-Götz 2014). (1)

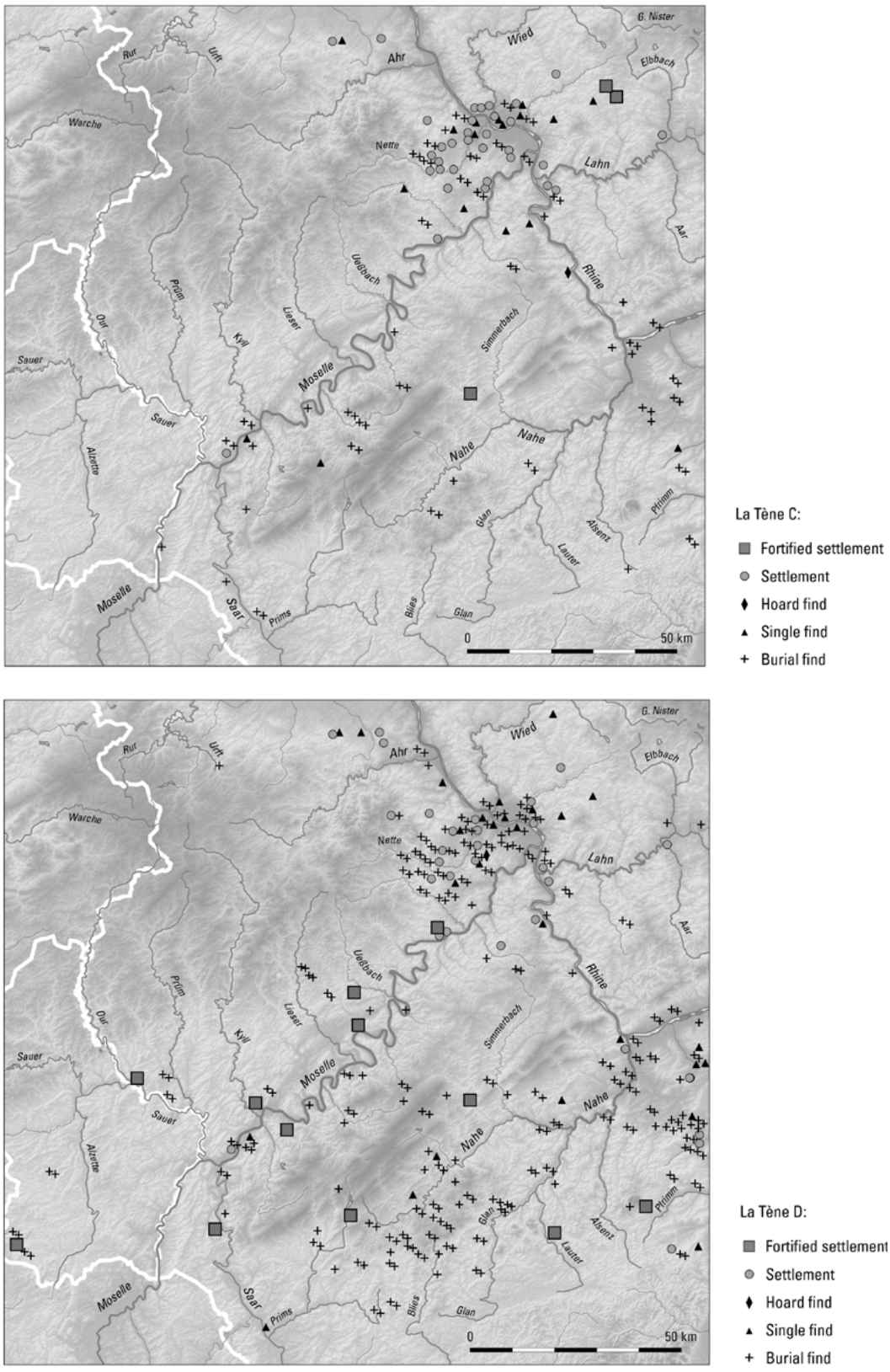

Figure 4: Sites of the La Tène A, B, C and D periods in the Hunsrück-Eifel area. The distribution maps clearly reflect the fall in population during La Tène B –here the decline appears to have occurred mainly in La Tène B2– and La Tène C (after Fernández-Götz 2014). (2)

comparison with similar phenomena occurring at this time in neighbouring areas such as the Ardennes and the Champagne; 3) information obtained from the Classical sources on population movements north of the Alps towards the south and east of Europe during the fourth-third centuries BC; and 4) the evidence of pollen diagrams.

Not long ago, in his section on the Hunsrück-Eifel Culture, Collis (2006: 163) stated that: "To suggest that the reduction of burial numbers in La Tène B-C is due to emigration to the south and east as part of a Celtic expansion would need confirmatory evidence such as pollen evidence". We now have that additional evidence in the form of pollen diagrams, so it is time to recognise that the hypothesis of migrations is by far the most plausible for this region, even though resorting to migration as an explanatory mechanism for cultural change has fallen out of favour since the Second World War. To avoid misunderstanding, I am referring to long-distance movements of population from the area of study to more distant areas (i.e. "long-distance migrations" to use the definition proposed by Anthony [1990]). Hence this phenomenon should not be confused with short- and medium-distance movements of population (eg. the short-distance migration of populations from the Neuwieder Becken to the western Eifel) that undoubtedly had already occurred during the preceding centuries through mechanisms that would include, amongst other things, the fission of certain communities in order to create new households.

Nevertheless, as in the case of the Champagne, there was never a complete demographic vacuum in the Hunsrück-Eifel but only a demographic decrease. Recent research in the Ulmener Maar suggests the same thing, that is only part of the population abandoned the region. Thus, while the emigration of some of the inhabitants has to be acknowledged, it is equally true that it was a partial, not a total, exodus. This is consistent with the available information on migrations during the Iron Age, since in most cases known to us (and with a few exceptions, such as that of the Helvetii) only part of the communities left, while the rest remained in their original territories (Kaenel 2007; Kristiansen 1998).

Climate Change and Resistance to Hierarchy

Having set out the arguments that suggest that part of the population of the Hunsrück-Eifel and Champagne regions emigrated, it is now time to look at the reasons for the exodus of some of the inhabitants of the areas being studied. If we turn to the Classical sources, they give different reasons for the so-called 'Celtic migrations', repeatedly citing overpopulation, which led to scarcity of resources, internal disputes (sometimes linked with the previous point) and the lure of the goods and wealth of other lands (Tomaschitz 2002). However, it has to be acknowledged that such a complex and protracted phenomenon cannot be reduced to a single monocausal explanation. In many cases, there is reason to assume that there was a combination of factors and that these synchronically and diachronically varied. Nevertheless, at a global level, some motives can be observed that probably had greater weight than others. In this respect, the ancient sources repeatedly mention demographic pressure that led to problems between groups and called for a short-term solution.

Be that as it may, the hypothesis of overpopulation (while it almost certainly contains a grain of truth) must have been only part of more complex processes, and in any case needs not necessarily have applied to all the communities involved in migrations. If we are to believe Anthony (2007: 110):

> People do not migrate, even in today's crowded world, simply because there are too many at home. […] But there are other kinds of «push» factors –war, disease, crop failure, climate change, institutionalized raiding for loot, high bride-prices, the laws of primogeniture, religious intolerance, banishment, humiliation, or simple annoyance with the neighbors.

The demographic growth that can be observed in the Hunsrück-Eifel and Middle Rhine region from the middle/end of the seventh century BC led to higher population density than in previous periods. However, population density was still low. If the number of inhabitants became a problem, then it must have been

in combination with other factors. This is where variables such as climate come into play. Climate could have acted, to a greater or lesser extent, as a 'push' factor both in the Hunsrück-Eifel and in the Champagne.

The role of climate variations in the development of Iron Age societies has been emphasised by Maise (1998). Although his interpretations require many qualifications, it has to be recognised that from a macro-perspective the principal climate stages of the first millennium BC coincide *grosso modo* with the different periods of greater and lesser centralisation north of the Alps, as many of the studies carried out in recent years also attest. Thus, the process of centralisation that gave rise to the development of the *Fürstensitze* of Hallstatt D and the *oppida* of La Tène D took place in predominantly warmer periods, while the migrations of the fourth century BC occurred during a colder phase (Figure 5). Yet, in addition to these general trends, there were also brief episodes of climate change that may have had a strong impact on certain populations. For instance, Fischer (2006) has linked the wetter climate of the years 120-114 BC with the historically documented migrations of the Cimbri and Teutones.

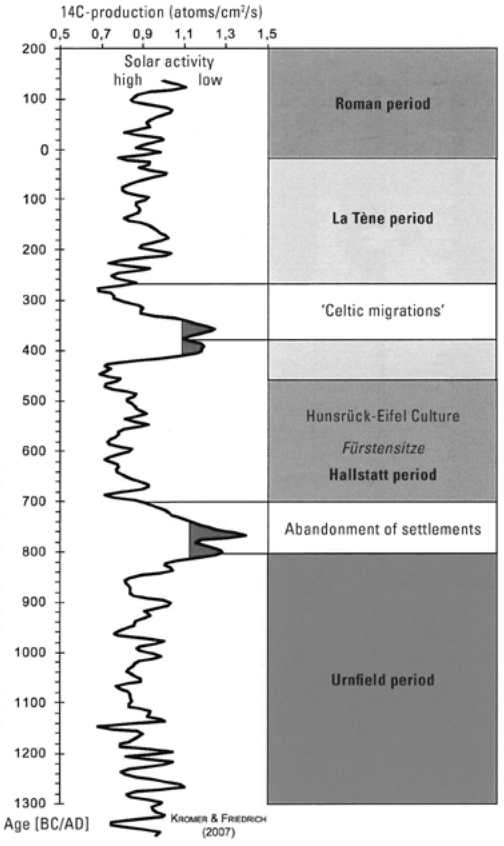

Figure 5: Evolution of solar activity between ca. 1300 BC and 100 AD (after Pare et al. 2009, reproduced with permission).

In relation to the topic discussed here, it should be pointed out that the Central European climate worsened around 400 BC; this was linked to a reduction of solar activity, and appears to have occurred relatively abruptly (Maise 1998; Sirocko 2009). The correlation of this phenomenon with the movements of the Gallic peoples that sacked Rome in 387 BC is so clear that it cannot be coincidental, although once again we should avoid simplistic interpretations that do not do justice to the complexity of the situation. Of course, this apparently clear general picture becomes more complicated when viewed in detail and in the analysis of specific regions. For example, while the decline in population in the Champagne at the beginning of the fourth century BC appears to coincide fairly closely with climatic changes, the environmental indicators do not clearly explain why some *Fürstensitze* such as Heuneburg or Mont Lassois were abandoned around the mid-fifth century BC, while others such as Hohenasperg continued to function during the second-half of the same century.

In the case of the Hunsrück-Eifel area, the correlation between cultural and climate change does not appear to have been as direct as in neighbouring Champagne. In fact, the demographic decrease in the Middle Rhine-Moselle region occurred *in the course* of the fourth century BC, and not at the beginning of that century, suggesting that the worsening climate cannot be used as a monocausal explanation. Thus the rich female grave of Waldalgesheim dates to 325 BC and the major fortified hilltop centres of the Hunsrück-Eifel Culture were apparently still in use until well into the fourth century BC. Therefore, the complex reality and the existence of a multiplicity of situations have to be stressed. In any case, the cooling climate would have had a more pronounced effect in the upland areas of the Hunsrück and the Eifel massifs (which were already less suited to agriculture). Cooling climate therefore fits fairly well with the decline in the population in these areas.

Having made these qualifications, one should go a step further and look at the question of migrations from a somewhat broader perspective that takes into account both possible specific triggering motives, as well as cultural

and ideological factors of a more structural kind that explain why a particular community reacts in one way as opposed to another. In a good proportion of cases, emigration was just one of several possible options. In fact, responses of societies to climatic changes varied considerably, so we cannot talk about environmental determinism.

Amongst the motives of a socio-ideological nature that may have prompted or contributed to migrations (at least in certain specific cases) I should like to draw attention, by way of a complementary hypothesis, to an idea already raised by Demoule (2006) in relation to the Aisne-Marne Culture: the possible role of these population movements as mechanisms that regulated power relations, in the sense that they would contribute to lowering levels of social inequality. Both in the Champagne and in the Hunsrück-Eifel, demographic decline caused by emigration reversed the trend towards increased hierarchisation that had occurred during the preceding period. The fission of part of the group is a solution frequently used to counteract the excessive entrenchment of coercive powers, so this possibility should not be surprising. As various anthropologists and historians have stated, the development of state formations is not inevitable and should not be seen as the 'logical', 'inevitable' or even less as the 'desirable' outcome towards which societies inexorably move. On the contrary, throughout history, numerous communities all over the world developed mechanisms specifically to avoid the appearance of state political forms, something which is well-discussed in the book 'Society against the State' by the French anthropologist P. Clastres (1989).

The Future of Migration Studies

By way of conclusion, in the years to come the archaeological study of migrations will progress concerning three fundamental aspects: 1) carrying out more contextual analyses that do justice to the true nature of each specific case without submitting to an anti- or a pro-migrationist bias; 2) the establishment of an ongoing dialogue with other disciplines such as anthropology and ancient history; and 3) the increasing application of new methods such as DNA or strontium isotope analysis. This will result in a moderate way of interpretation that goes beyond the explanations at either end of the spectrum: from the simplistic formula of 'pots = people' of the ethnic-cultural paradigm to the immobilist approaches of some processual and postprocessual archaeologists. Finally, it should be stressed that migrations need not be associated only with war, conquest and confrontation, but can also be related to integration, hybridity and cultural exchange. In any case, whether for good or ill, the history of humanity would be incomprehensible without them.

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‘My kingdom for a pot!’ A reassessment of the Iron Age and Roman material from Lagore crannóg, Co. Meath

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University College Dublin

> *In short, Romans have traditionally been explained in terms of “influence” but not “presence” when dealing with the development of Ireland.*
> Mallory (2013: 189)

The crannóg at Lagore, Dunshaughlin, is located in County Meath, north of Dublin. It is one of the key sites for the study of Early Mediaeval Ireland and has become a keystone in the elaboration of relative chronologies for the period (see Lynn 1983: 47; O’Sullivan 1998, 21; Henderson 2007: 201). A substantial number of prehistoric artefacts have been recovered from the site but were rejected by the excavator as being either residual or as having been brought to the site at a later date. However, the published report (Hencken 1950) presents a considerable number of flaws and contradictions (Raftery 1981: 83) and the dating of the site itself has been much debated. The dramatic increase in the number of excavations over the past twenty years has provided us with a clearer picture of Irish society in the first millennium AD (eg. Corlett and Potterton 2012; O’Sullivan *et al.* 2014). In the light of this recent research, a reassessment of the prehistoric and Roman material from the site of Lagore was undertaken by the present author as part of a three-month research placement for the *Late Iron Age and Roman Ireland* (LIARI) project within the Discovery Programme, Ireland’s centre for advanced research in archaeology. This paper will present some of the results of this study, focusing on select categories of artefacts, such as weaponry and pottery. It will also propose a framework within which to consider this earlier material, integrating it into our current understanding of the materiality of the Later Irish Iron Age (AD 0 – 400).

Lagore crannóg: a presentation

Lagore crannóg is known from the historical sources as having been an important Royal Seat during the early mediaeval period in Ireland. The site was rediscovered in 1839, when a drain was cut across the bog and revealed quantities of animal bones. From one of his visits, the antiquarian William Wilde recorded findings of “antiquities”, including several swords and various other weapons, quern stones and iron chains (1840: 424-426). A few years later, the site was once again disturbed, this time by turf-cutting activities between 1846 and 1848. This exposed more archaeological material, notably “remains of ancient stockading and the ruins of several structures” (Wood-Martin 1886: 24). Some of the artefacts uncovered during these two episodes were later acquired by Wilde and his fellow antiquarian George Petrie, but the large majority were unfortunately dispersed and cannot be retrieved (Wood-Martin 1886: 25). Petrie’s and Wildes’s collections were later given to the National Museum of Ireland and are referred to as “Old Finds” in this paper, the terminology used in the site report. Almost a century later, the Harvard Expedition chose to excavate the site as part of its fieldwork programme in Ireland. The excavations took place between 1934 and 1936 under the direction of H.O. Hencken, with the final report published some fifteen years later (Hencken 1950).

The published report includes a *History of Lagore from the Annals and other sources* by Liam Price (Hencken 1950: 18-34) which presents the history of the crannóg, as told in the written record. The site is

thus said to have been occupied at least from AD 651 and became the seat of the Kings of Southern Brega between AD 785 and AD 969, after which date it disappears from the sources. These dates were accepted by Hencken as a chronological bracket for the archaeological phases of the crannóg, something which has sparked some debate, especially surrounding the date of the beginning of occupation at Lagore (Raftery 1981: 83-84). Earlier imported pottery for instance - including Roman Samian ware from the 2nd century- was overlooked because it did not fit the historical narrative (Ryan 1973: 623), as was later mediaeval evidence (Kerr et al. 2009: 495). In a detailed reassessment of the early stratigraphy of the site, Lynn (1985/6) argued that what Hencken called "Period Ia" and considered to be a single construction phase for the crannóg was in fact made up of multiple layers, representing the earliest occupation of the island. This meant that the artefacts in Period Ia could no longer be taken as a *terminus post quem* for the beginning of the settlement of the crannóg and that an earlier date should be considered for it. The bottommost layers of the site could never be excavated (Hencken 1950: 38) and as such, the exact dating of the earliest phases of the crannóg remains open to interpretation. Lynn's reassessment of Period Ia is today widely accepted and the construction of the crannóg is dated to the 7th century (eg. Kerr et al. 2009: 494). It is however the question of the "*pre-crannog*" phase of activity at Lagore that will be subject of attention in this paper.

In recent years, the Discovery Programme's *Lake Settlement Project* subjected the human remains recovered from Lagore to radiocarbon dating. The results showed that the remains had been deposited in three separate phases: one during the Bronze Age, a second one in the Iron Age, and a third in the Early Mediaeval period (see Carty and Gleeson 2013: 32 for an overview; the radiocarbon dates themselves remain unpublished at the time of writing). The Iron Age remains were concentrated in the south-west area of the site and do not represent a "normal cemetery population" (Carty and Gleeson 2013: 32). They are fragmentary and consist mainly of adult female and sub-adult long bones showing signs of peri-mortem breakage. This suggests a practice of selective secondary deposition during the Later Prehistoric period and may be linked with ceremonial activities, as we shall see below (see also Fredengren 2002: 190ff and Cavers 2006: 404ff for a wider discussion of this phenomenon). Hencken disregarded these human remains for their "lack of anthropological data" and only described the mediaeval skulls in his report (1950: 198ff.). This is a strong reminder of the agenda behind the Harvard Expedition and its involvement with eugenic ideology: "Celtic" Ireland – here to be understood in the sense of Early Mediaeval "Celtic" - was thought to be "culturally and racially intact" and was therefore selected as the subject of the Expedition's work (Cahill Wilson 2012: 16; Carew 2012: 38). This can be glimpsed throughout the published report, which more often than not dismisses foreign material as being insignificant to the site history. The prehistoric human remains however, coupled with the artefactual evidence, lend considerable support to a pre-crannóg, pre-mediaeval phase of activity at Lagore (Gleeson 2012: 6).

The prehistoric and Roman material from Lagore

The Lagore assemblage presents a number of problems. The outdated excavation and recording methods resulted in the majority of the finds being unstratified and the exact find-spot of a considerable number of finds not being documented at all. Over 1500 finds, not considered to be artefacts by the excavator and thus not recorded properly, were catalogued by the Museum over the past few years and lack almost all context information. In total, 3243 excavated artefacts and a further 379 "Old Finds" are known from the site (as of August 2013). Of these, only ca. 20% are stratified.

The earliest material recovered from the site of Lagore consists of a sherd of Neolithic pottery (Hencken 1950: 123), a bronze spearhead and a bronze dagger, both of Bronze Age date (Hencken 1950: 58-59). A large number of artefacts of possible Iron Age and Roman origin are mentioned in the report (for an overview, see Hencken 1950: 12-17), such as weapons, jewellery – including Romano-British bangles and melon beads -, toilet implements, glass fragments, and nails. These are mostly found, when stratified, in the bottommost layers of the site. In the site report, Hencken dismisses the majority as being either

residual or as having been brought to the site at a later date. However, the sheer quantity of this early material challenges his interpretation and calls for a reassessment (see also Henderson 2007:201). In order to overcome the problems inherent to the disturbed stratigraphy of the site, we shall consider the Lagore assemblage with regards to the wider occurrence of Iron Age and Roman artefacts in Ireland. For the scope of this paper, only a selected number of finds will be discussed, namely iron swords, a barrel padlock, and Roman pottery.

Swords

Eight swords are known from Lagore, only one of which comes from the Harvard excavations (Period Ia). In the published report, Hencken highlighted the possible affiliation of six of them with prehistoric (mainly La Tène) and Roman weapons (1950: 88-99). Only thirty swords of Iron Age date are known from Ireland (Mallory 2013: 180), a small number which makes their study rather difficult. The Lagore swords present straight parallel edges like the Roman *gladius* and *spatha* and one of them, Figure 1C, is even similar in proportions to the *gladius* (Hencken 1950: 91). Another sword, Figure 1B, appears to be a clear parallel for similar weapons recovered from the site of Illerup Ådal, one of the largest Iron Age weapon deposits in Denmark (Cahill Wilson 2014a: 28). Illerup was subject to scientific excavations in the second half of the 20th century and as a result, its successive deposits are fairly accurately dated (see Grane 2007: 226ff. for an overview). This parallel lends support for an Iron Age date for the *production* of the Lagore sword. Since it is an antiquarian find however, nothing can be securely inferred regarding its final deposition, but the possibility of ritual activity will be reviewed below.

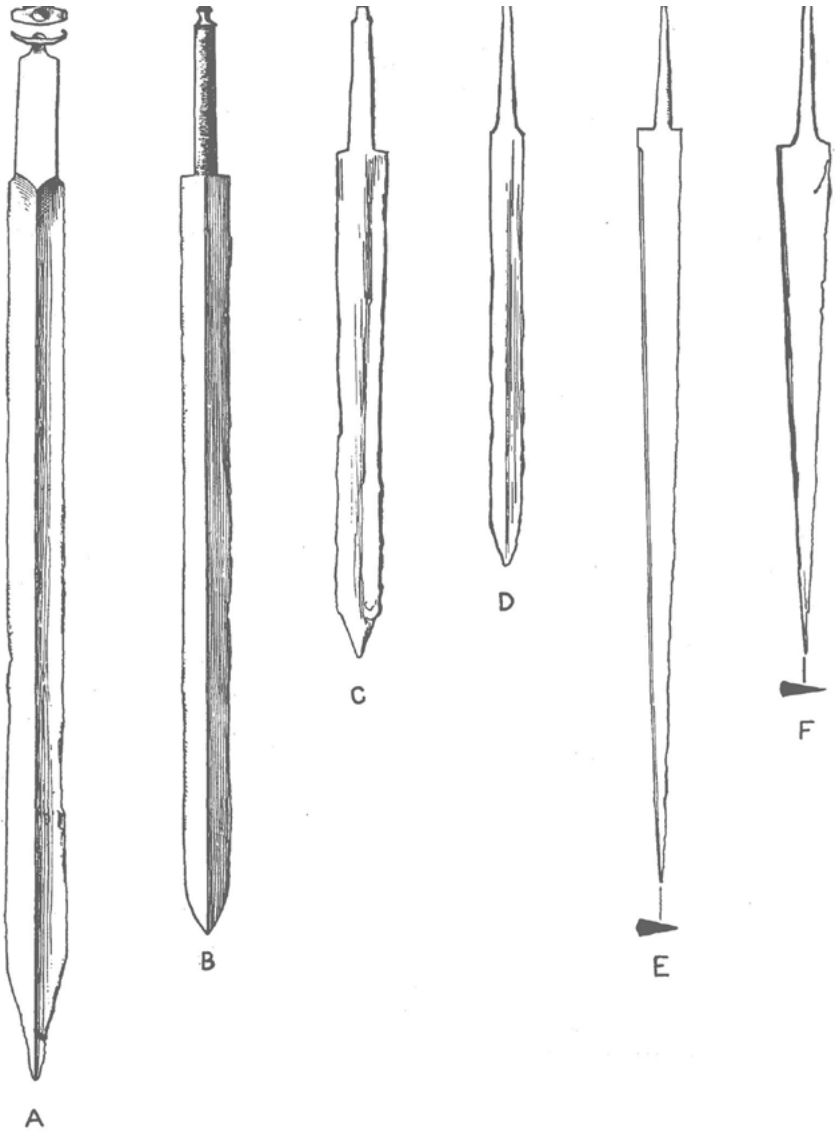

Figure 1: Swords from Lagore ©Hencken 1950: fig.55. Reproduced with permission of the Royal Irish Academy

Barrel padlock

Remains of an iron barrel-padlock of Roman type were discovered at Lagore in the 19th century (Lucas et al. 1961: 97). An almost exact parallel for this padlock comes from the Rath of the Synods on Tara (Figure 2), where it was recovered during the 1950s excavations. It was found along with the rest of the Roman material from the site, in Phase 4, which is dated to the 3rd-4th centuries AD (Velzian Donaghy 2008). Phase 4 was first interpreted as "the high-status homestead of a native Irish group with familial ties" with Roman Britain (Grogan 2008: 97). However, this has been questioned in recent years, and an alternative reading of the site as a possible shrine was put forward, based the parallels between Phase 4 and Romano-British shrines (eg. Cahill-Wilson 2012: 24ff). What is more, a key for a barrel-padlock of the same type was unearthed at the site of Uisneach, Co. Westmeath along with a number of Iron Age finds (Donaghy and Grogan 1997: 25). Uisneach is an important monumental complex which goes back to the Neolithic period and had a ceremonial nature during later prehistory (Donaghy and Grogan 1997: 26). Such padlocks were functional objects in the Roman world, but their presence at ritual sites in Iron Age Ireland invites us to question their significance in those contexts.

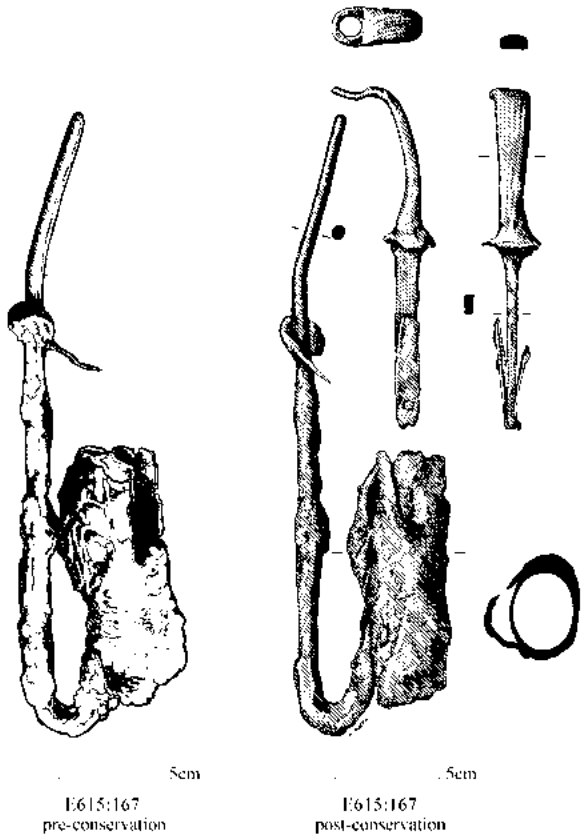

Figure 2: Roman barrel padlock from the Rath of the Synods, Tara. ©Grogan 2008: fig. 4.11. Courtesy of UCD School of Archaeology

Roman pottery

Four sherds of Samian ware – called *terra sigillata* in the report – were found at Lagore. Hencken argues that it can "hardly be used to date the crannóg" since the only stratified piece was found in Period Ia which also contained later artefacts (1950: 6). However, as we have seen above, Period Ia is highly likely to have been made up of several layers of occupation and in this case, Hencken's argument becomes invalid. The only stratified sherd of Samian ware is a "tiny chip" – now lost - that was found "not under the crannog but in it" (Hencken 1950: 123). If Samian vessels or fragments were present at the site of Lagore prior to the construction of the crannóg, it is possible that this small chip could have been incorporated into the building material. The two larger sherds however, 662 and 673 on Figure 3, were examined by the present author and their degree of preservation makes it rather unlikely that they "represent the debris from some earlier site" (contra Hencken 1950: 123). The red slip is mostly preserved and the decoration is still very visible. They come from Central Gaulish vessels and are respectively dated to ca. AD 150-160 and ca. AD 140-150 (Hencken 1950: 124). Fragments of Samian ware have been recovered from Iron Age layers at a number of sites, notably the Rath of the Synods (Evans 2008) and from Knowth, Co. Meath (Mulvin 2012). There is therefore no reason to consider these sherds as necessarily reliquary (contra Warner 1976).

The last Samian sherd from Lagore, however (1169), may present a different story. It was reworked, polished and pierced, probably for suspension (Hencken 1950: 123). Similar examples of Samian "pendants" were found in graves at Møllegårdsmarken and Slusegård in Denmark (Lund Hansen 1982: 85ff). The remaining grave goods also included glass vessels and silver *denarii*, an indication perhaps that

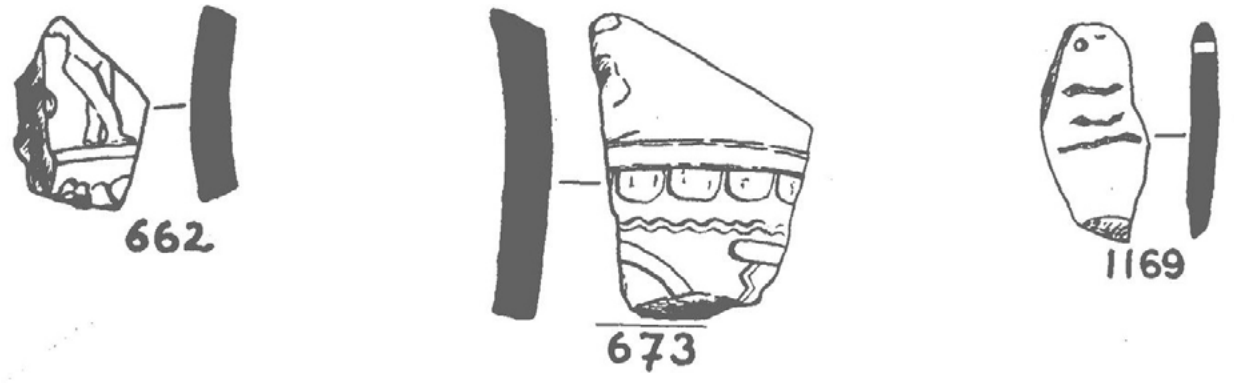

Figure 3: Samian pottery from Lagore © Hencken 1950: fig. 57. Reproduced with permission from the Royal Irish Academy

those Samian pendants were regarded as being as valuable. However, we also have evidence for the re-use of Roman pottery in Anglo-Saxon contexts, where fragments of Samian were found in "amuletic" bags, along with fossils and crystals, and have been interpreted as having an apotropaic function (Eckardt and Williams 2003: 154). Since the Lagore sherd is unstratified, we are left for now with educated guesses regarding its significance and use.

Lagore before the crannóg: an Iron Age sacred lake?

As this quick overview has shown, the prehistoric and Roman material from Lagore is not unparalleled in Iron Age Ireland. What can they tell us about a pre-crannóg phase at Lagore? The human remains from the site are clear evidence of non-secular activities being carried out during the later prehistoric period. Ongoing research on the ritual landscape of Tara may provide a background against which to consider the Iron Age of Lagore and its potential significance within Meath – and Ireland (eg. Bhreathnach 2005; Newman 1997).

In a recent paper, Newman (2011) examined the landscape surrounding the Hill of Tara and argued for the "cosmographical centrality" of the ancient Gabhra river, which took its sources in Dunshaughlin and flowed through a highly sacralised landscape that saw intense religious activity during the 4th to 6th centuries AD. Newman sees Lagore and Tara as connected via the *itinerarium sacrae* that perhaps followed the river course through a valley where numerous other ritual sites were found. The inauguration processions of the Kings of Tara would thus start at Lagore and work their way northwards into the valley between Tara and Skryne (Figure 4). Newman thus argued that Lagore was closely associated with Tara and that the "special pedigree" of the site went further back in time than the mediaeval crannóg. Central to this reflection is the association of horses, and especially white mares, with the early Irish kingship (Ní Chatháin 1991): the Irish name for Lagore is *Loch Dá Gabor* ("lake of the two mares"). The *Metrical Dindshenchas,* a Middle Irish text recounting the lore of place names and their associated traditions or mythology, explain the origin of this name as stemming from the story of the drowning of two horses presented to the King of Tara by the King of Munster.

Some of the evidence from the site, such as the weaponry, may be considered in that light. In addition to the swords discussed above, a number of leaf-shaped spearheads of possible Iron Age date were recovered from the site, as well as a tanged "spearbutt" similar to La Tène types (Raftery 1983: 132-133). The only two stratified weapons from Lagore – an iron spearhead and an iron sword – were both found lying "flat at the bottom" of the lake, beneath the body of the crannóg (Topographical Files, National Museum of Ireland). The practice of depositing weapons in bodies of water is certainly attested in later prehistory

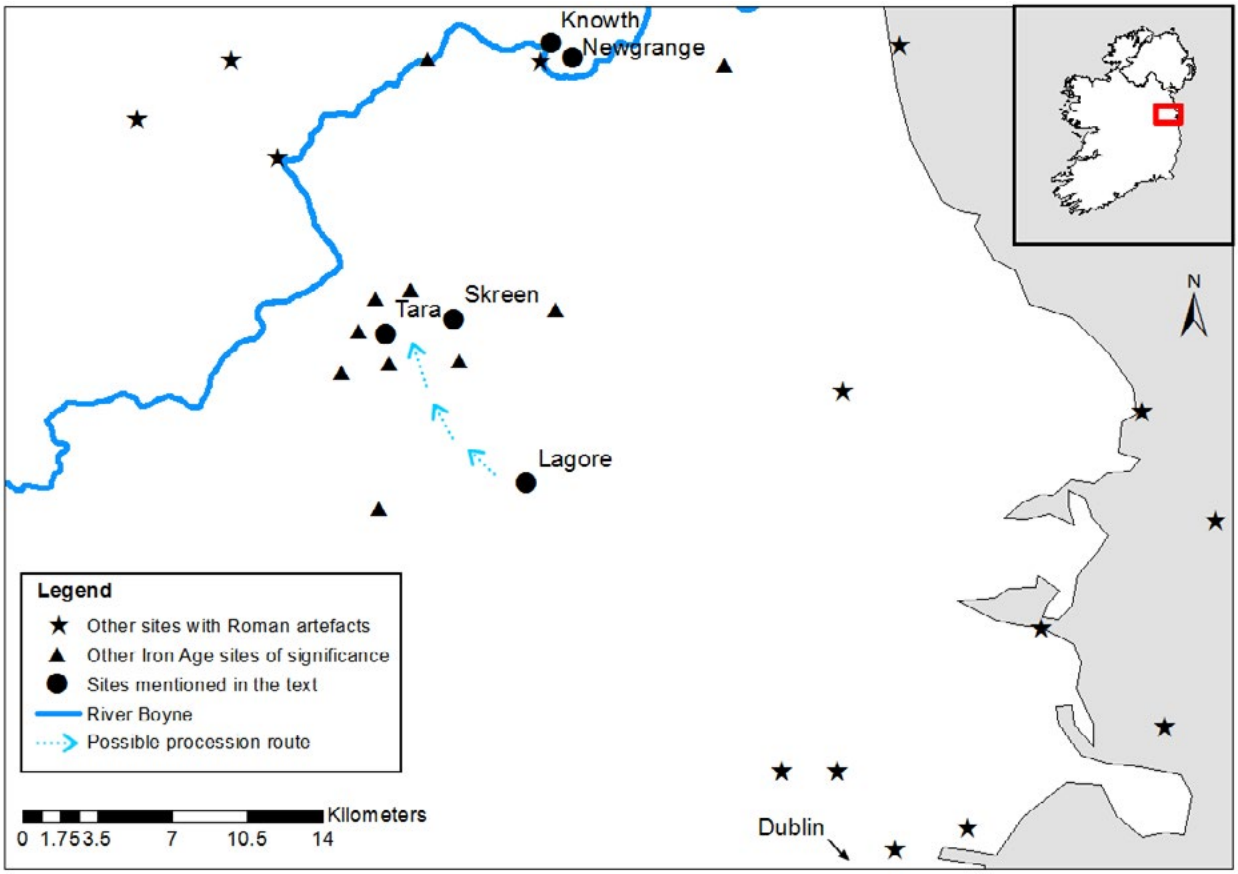

Figure 4: Lagore in its prehistoric setting: a starting point for a procession to Tara?

(Mallory 2013: 177) and indeed at crannóg sites (Fredengren 2002: 190ff; Cavers 2006: 404ff). In this light, it is perhaps also worth mentioning that the *Metrical Dindshenchas* record Lagore as "*láech-loch",* ie. "warriors lake". Furthermore, a sword which is dated to around the birth of Christ, comes from the site of Ballinderry crannóg 2, Co. Offaly (Armstrong 1923: 19; Raftery 1984: 68). It has parallel sides and is the longest sword known from Ireland for this period – 57.9cm. Its exact relation to the mediaeval crannóg of Ballinderry 2, also excavated by the Harvard Expedition (Hencken 1942), is unknown, but quite importantly Arretine ware and Romano-British pottery were also recovered from the site. The Arretine sherd was dismissed as having "no significance for dating" (Hencken 1942: 49) and is as such compared to the Samian found at Lagore. However, unlike Lagore, the earliest levels of Ballinderry 2 were excavated and did reveal a phase of Bronze Age occupation. It is worth remembering here that a dagger and a spearhead of Bronze Age date were recovered from Lagore (Hencken 1950: 58-59).

Ballinderry could thus provide a possible parallel for the extended use of a *location* from prehistory into the mediaeval period, with the deposition of similar material – weapons, pottery – during the Iron Age. The continuous use of a location, although with changes of function, is a common feature of prehistoric and early historical sites in Ireland (Donaghy and Grogan 1997: 26). This phenomenon is visible at for instance Tara, Newgrange, Uisneach, and Ballinderry, which we have discussed above. In the light of the prehistoric assemblage recovered from Lagore, it is possible to envisage a similar (pre)history for the site, with successive uses in the Bronze Age, Iron Age and the later mediaeval period. Indeed, Lagore was possibly chosen as the appropriate location for a royal residence in Early Mediaeval times precisely *because* of this prehistoric horizon and the heavy ritualization of the surrounding landscape in the preceding centuries (Carty and Gleeson 2013: 53).

Conclusion

Lagore and its crannóg form a complex site. Due to the disturbed stratigraphy and partial record, many of the questions raised are difficult or indeed impossible to answer. A complete reassessment of the earlier phases of the site was beyond the scope of this paper. Instead, it is calling for a reconsideration of the evidence in the light of recent research in later Irish prehistory. By viewing the Iron Age and Roman finds from Lagore in their wider, regional context, one can see how these artefacts could fit into the longer history of the site within Meath. Attitudes towards the Roman material found in Ireland have changed over the past twenty years or so and it is now time to consider it as an integral part of the narrative for the later prehistoric period (Cahill Wilson 2012; 2014a). The *Late Iron Age and Roman Ireland* research team are currently publishing the results of their three-year research project which not only reassessed the entire Roman assemblage from Ireland, but also conducted extensive field survey and isotopic analyses in order to shed greater light on the late Irish Iron Age (Cahill Wilson 2014b). It is within the wider picture that is emerging from their work that the hypotheses emitted in this paper should be considered.

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When is a mortarium not a mortarium? Analogies and interpretation in Roman Cumbria

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As archaeologists we seek to 'deduce information about the things that led people to behave in certain ways' through an examination of the final material outcomes of particular actions (David 2004: 68). But this process is complex and fraught with difficulties. We must work particularly hard, for example, to overcome 'the distance between one frame of reference (the present) and another (the past)' (Shanks and Tilley 1992: 107) and analogies, which usually 'consist of an equation between a modern, usually ethnographic 'source' and an archaeological 'subject'' (Bernbeck 2000: 143), are perhaps the most commonly used interpretative tool. A detailed review of literature concerned with rural farmsteads has suggested that, in one region (Cumbria), the uncritical application of analogies has resulted in [a] 'top-down' or [b] 'bottom-up' narratives which privilege either [a] 'invader' or [b] 'native'. This paper will explore this situation in detail and, by focusing on a single pottery form (the mortarium), will argue that if we want to achieve a 'middle ground' interpretation of everyday life in this part of Roman Britain we need to accept that analogies do not bridge the gap between 'us' (in the present) and 'them' (in the past); that at best they can help us to make well-informed inferences (Bernbeck 2000: 143).

Analogies in Archaeology

A great many archaeologists have debated the pros and cons of using analogies within our discipline; it has been noted, for example, that the original critics of this practice were reacting against interpretations which represented 'simple and direct reading[s] of the past from the present' (Wylie 1985: 68; for discussion see Wylie 1985). This most basic type of analogy is illustrated in (Figure 1). In this model similarities are identified, and thereafter inferred, between a modern 'source' [1] and an archaeological 'subject' [2]; for the purpose of this paper we might consider [1] a (near) contemporary economy and [2] the economy of Roman Britain. The process of analogical inference can be explained in the following manner:

> 'Source and subject share some characteristics, while usually many other traits may be known for the source but not for the subject. The unknown elements are the goal of the analogy. The assumption is that if characteristic traits a, b, c are similar in source and subject, then traits m, n, o, which are only known for the source side, will be equally typical for the subject side' (Bernbeck 2000: 143).

However, Figure 1 only consists of temporal elements. The problem in Cumbria is that most rural settlements (either Iron Age or Roman) produce few diagnostic artefacts (Haslegrove 2002: 69; McCarthy 2005: 64; Philpott and Brennand 2007: 38; Shotter 2004: 110). As a result narratives concerned with the economy, for example, have relied on analogies from other parts of the Roman Empire in order to explain its mechanics. The inclusion of these spatial elements in an illustrative model requires additional archaeological 'subject'[s] [3] (Figure 2). As in Figure 1, Figure 2 illustrates known similarities [a] and inferred similarities [b], [d] and [e]. In the case of [b], similarities between [2] and [3] are inferred because [a] is shared between [1], [2] and [3]. There are also known similarities between [a1-a2] and [b1-b2]. The difference in Figure 2 lies in the inclusion of [c] and [f]; [c] is a scenario in which dissimilarities are shared between 'source' and both 'subjects' (i.e. [1], [2] and [3]). Once again [1] is a (near) contemporary economy, but in this case [2] is the economy in the South of *Britannia*, and [3] in the North of *Britannia*. The assumption is that, because some traits (it is important to note that these can be similarities or dissimilarities) are shared between [1] and [2], and between [2] and [3], that [1] is analogous to [3].

The addition of another tier (Figure 3) further complicates the issue. This model might, for example, illustrate the analogical reasoning which underpins debates concerning the economic impact of the Roman Conquest; in this case [1] is a (near) contemporary economy, [2] the economy of the Roman Empire, [3] the economy of *Britannia*, and [4] the economy of Roman Cumbria. What these models (Figures 1-3) illustrate is a) a reduction in the number of shared known similarities (or differences) which, roughly, corresponds with b) an increase in the complexity of inferred similarities (or differences).

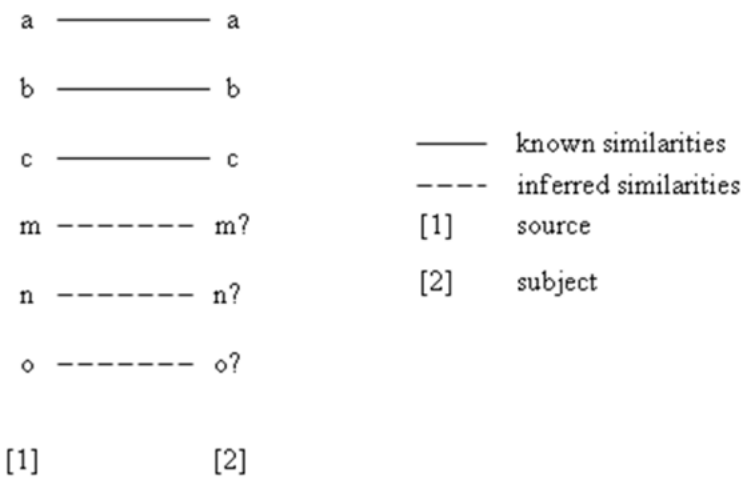

Figure 1: Single-tiered archaeological analogies (after Bernbeck 2000: 143)

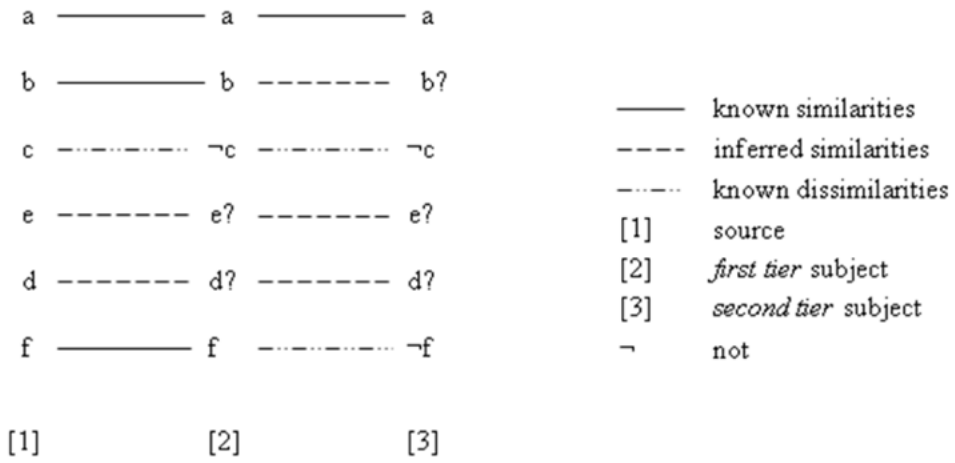

Figure 2: Two-tiered archaeological analogies

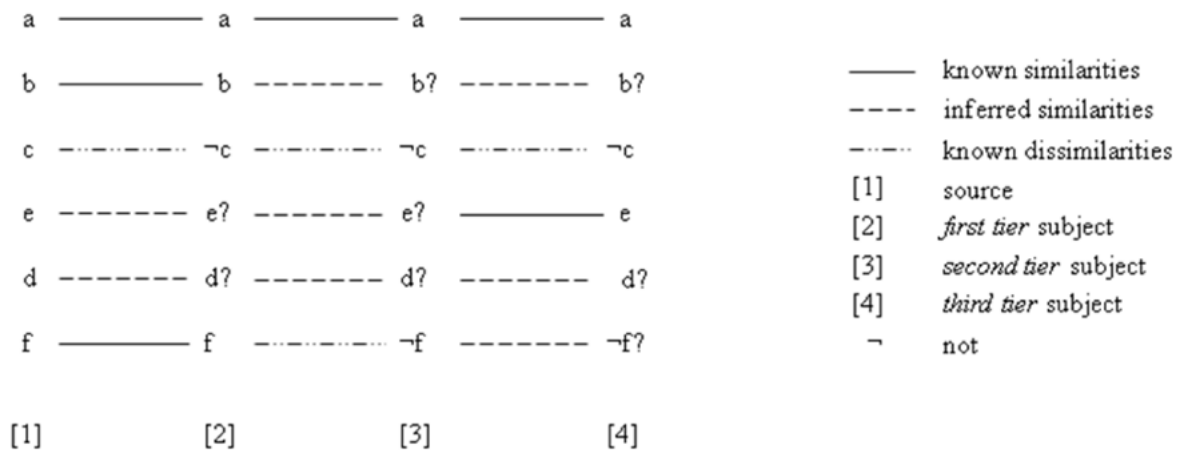

Figure 3: Three-tiered archaeological analogies

Ultimately, with each additional tier, the value of the analogy between subject[s] and source becomes weaker, which results in a far less reliable interpretation of the archaeological evidence.

Figures 1-3 are all examples where archaeological evidence is interpreted from the 'top-down'. Similar problems occur when undertaking 'bottom-up' interpretations, and this is particularly evident in our interpretation of objects. It has been argued that an object has no inherent meaning; that, instead, meaning emerges as a product of an ongoing dialectic between an object (e.g. a pot) and the subject (i.e. the consumer) (Shanks and Tilley 1992: 111). But a structuralist approach emphasises that '*texts*, including material culture... cannot be taken at face value' (Salmon 1992: 236). In its broadest sense, structuralism strives to achieve interpretation by applying 'a framework of linguistic concepts' to the examination of non-linguistic situations; in archaeology this means that an artefact assemblage is seen as being analogous to sentence structure (Wylie 2002: 127). However in order to 'read' it we need to be able to translate the 'language' which, as has been demonstrated, is often achieved by the use of analogies. This means that structuralism is a second type of multi-tiered analogical model, which is best described as a 'nested' analogy (Figure 4).

While in the first tier we are drawing comparisons between [1] sentence structures and [2] artefact assemblages, in the second these are between [ii] the material 'language' used (which is the inference between [1] and [2]) and [i] a comparable (likely ethnographic) analogy. The complexity of this model demonstrates how, by uncritically and indiscriminately applying 'nested' analogies to archaeological assemblages (which results in multi-tiered models), archaeologists risk weakening their final interpretations.

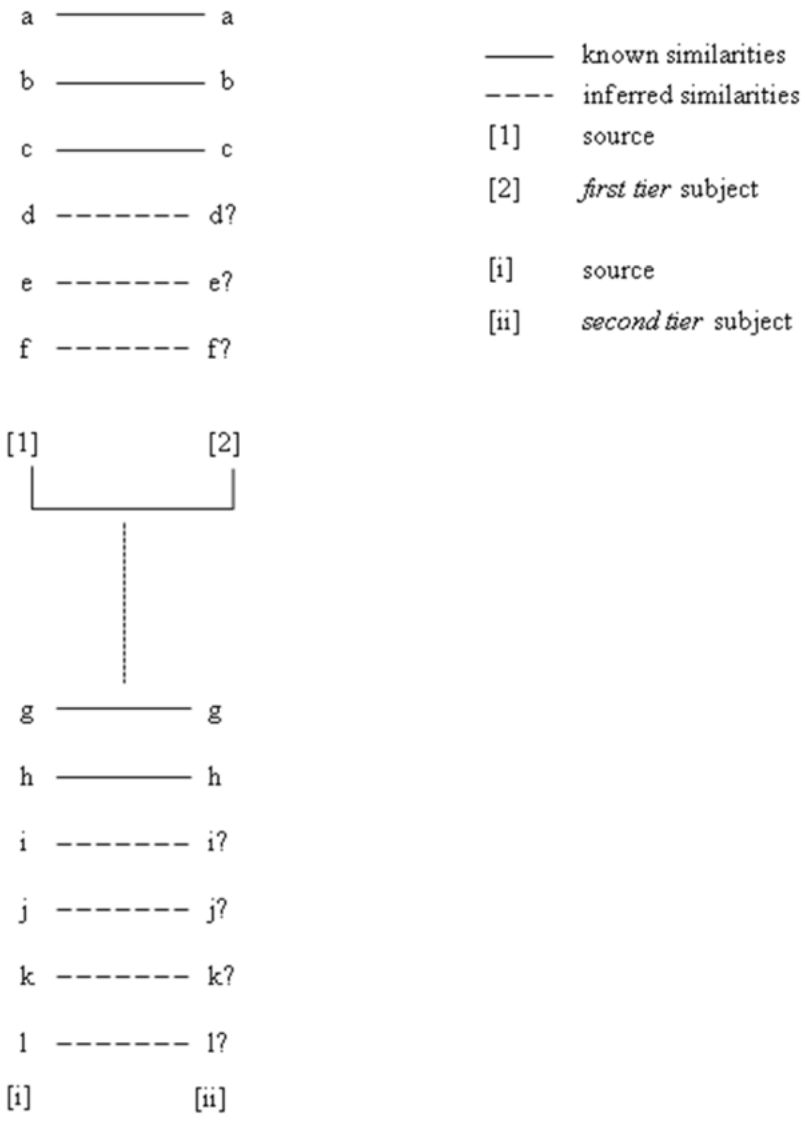

Figure 4: 'Nested' analogies – structuralism

Interpretation in Romano-British Archaeology

What does this mean for the study of objects in Roman Britain? It is important to note that what lies behind actions, and more specifically the choice of one action over another, is intention. We often assume that by having an awareness of past social norms we will be able to 'infer contextually the nature of that intentionality' (David 2004: 69). However, a hermeneutic

reading of the interpretative process, one which emphasises '*how* we understand: what conditions make understanding of otherness, past or present, possible' (Johnsen and Olsen, 1992: 420), demonstrates how interpretation is influenced by the position we occupy in contemporary society. This can be seen in the way that archaeologists write about a single 'Roman' object: the mortarium (Figure 5).

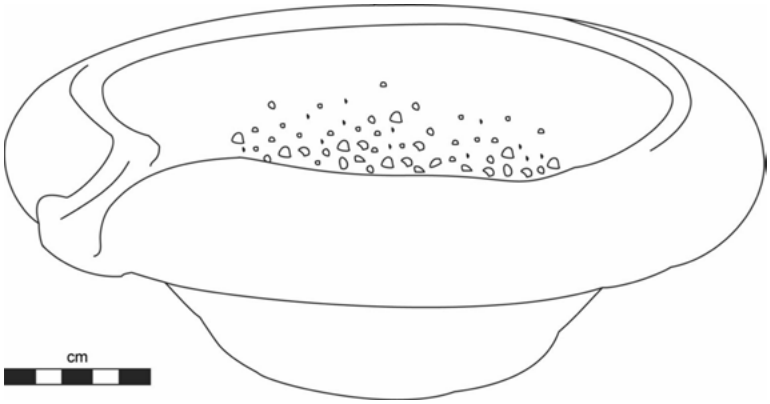

Figure 5: A typical mortarium found in Roman Britain (after Cramp et al. 2011: Figure 1: 1340, reproduced with permission)

Firstly it is important to be aware of the fact that one of the ways we most often use analogies is to establish the function of objects in the past, with one researcher going so far as to argue that we can *only* make 'inferences about an artefact's function...by resorting to analogy' (Krieger 2006: 88). In the case of mortaria a reliance on textual sources and its physical characteristics (especially the presence of trituration grits and pouring spout) means that archaeologists have tended to assume that they used for a single purpose, the processing of herbs and oil, and were therefore 'an unproblematic part of... pottery assemblage[s]' (Cool 2004: 30). However recent analysis of plant and animal lipid residues from British and German mortaria has begun to challenge these long-lived assumptions and that, instead of being 'unproblematic' objects, they were sometimes adapted in order to process a much wider range of ingredients (Cramp *et al*. 2011: 1341). Although this suggests that the function of a mortarium may have been flexible, its focus on the use of mortaria as a tool for processing ingredients is frustrating given the fact 'sooting or burning… has been observed on sherds from a range of sites' (Cramp *et al*. 2011: 1340-1341). It can be argued, therefore, that this bias is not only a consequence of the influence of ancient textual sources but of our position within contemporary society; that how we understand the function of a mortarium is likely influenced by the modern pestle and mortar.

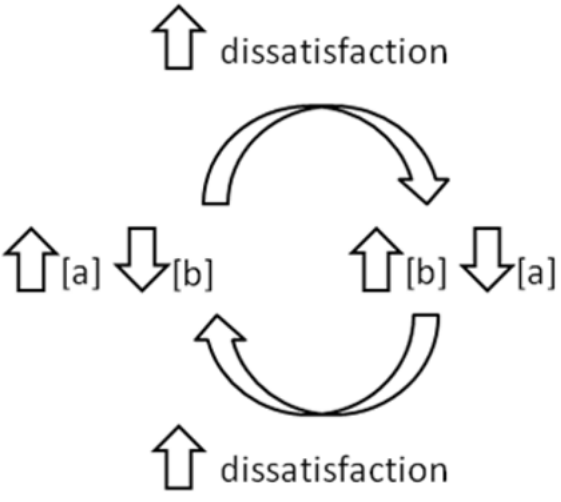

Figure 6: Hermeneutic cycle of interpretation

But if we cannot use analogies in the ways we have previously (e.g. to ascertain function) then how might we address this temporal divide? A starting point is to be aware that, in Cumbria, archaeologists appear to have become caught up in a hermeneutic cycle (Figure 6). Within this material assemblages are interpreted as illustrating either [a] or [b]; it has been noted that most arguments in archaeology narratives focus on how objects were valued for [a] their functional, technological and adaptive attributes or [b] their ability to articulate distinct, socio-cultural identities (Olsen 2003: 90). The problem is that when [a] dominates archaeological narratives [b] tends to be afforded less attention and so, with increasing dissatisfaction in [a], there is a shift towards [b]. This will eventually result in the dominance of [b] and a reduced interest in [a], and so on, to the extent that we become caught up in a hermeneutic vicious cycle. The final section of this paper will explore how we might break out of it.

Case Study: Farmsteads and Mortaria in Cumbria

It has been argued that mortaria are the most common type of 'Roman' pottery found on farmsteads in Cumbria (Evans, pers. comm.; Philpott and Brennand 2007: 86). This observation is supported by recent analysis which demonstrates that 48% of the 31 sites produced evidence for some sort of pottery, 35% mortaria, 23% samian, 16% Black Burnished Ware 1, and 10% amphorae (Peacock in prep.). While the percentages are relatively low it is important to appreciate that pottery is rare on most of the Iron Age farmsteads which have been excavated in the North West of England and, indeed, is often entirely absent (Hodgson and Brennand 2006: 51). The fact that pottery is being consumed on such sites in Cumbria during the AD 70s is therefore a noteworthy change in behaviour. This change, along with the fact that pottery is present (albeit in small amounts) on 48% of farmsteads suggests that it is not a status indicator. If an Iron Age elite existed they did not articulate it through the consumption of manufactured commodities; many have argued that, instead, this was most likely accomplished through the ownership of cattle, sheep, and horses (Cunliffe 1991: 112; Piggott 1958: 14-16 and 18; McCarthy 2005: 59-60; Sargent 2002: 225). They might have lived in the *vici* associated with forts (McCarthy 2002: 100) or in the *civitas* (urban centre) at Carlisle (Higham and Jones 1985: 52; Philpott 2006: 71; Shotter 2004: 111) but, even if this was the case, then this still does not explain the arrival of pottery (including mortaria) at farmsteads.

There has been a tendency for the small amounts of pottery on farmsteads in Cumbria to be interpreted in one of two ways; as an indication that [a] the inhabitants of Northern farmsteads were less socially-evolved than their Southern contemporaries or [b] they were making a deliberate statement about their socio-cultural identity. The problem with [a] is that it overlooks the distinction between interaction and cultural transmission; that 'the former can exist without the latter' (Knappett 2011: 136) and while the presence of pottery is evidence for interaction it does not necessarily indicate a change in the everyday lives of the rural population. There are also problems with [b] in that, while archaeologists have more recently suggested that pottery is rare on farmsteads because it (and by extension its social and cultural associations) was deliberately rejected (Hingley and Willis 2007; Loney and Hoaen 2005; McCarthy 2002), this kind of interpretation fails to explain the presence of pottery on 48% of farmsteads in Cumbria. So how do we found a 'middle ground' between [a] and [b]?

Archaeologists studying other parts of the Roman Empire have suggested that certain types of pottery were adopted and adapted (i.e. appropriated) by local populations 'as part of the material expression of their own culture' (Cooper, 1996: 95); that this was done so in order to construct and reinforce their identities, and to maintain and reproduce social order (Hodder, 1979: 446; Mattingly, 2007: 520; Vives-Ferrándiz, 2010: 209). The problem is that there is little evidence to suggest the nature of Iron Age 'culture' in Cumbria. This paper has illustrated the problems with the uncritical use of analogies and so it argues that, in order to occupy an interpretative 'middle ground', we need to return our attentions to the 'things' we study. Firstly it is useful to ask the following questions: 'what if things *themselves* can be fluid rather than bounded?' and 'can we look into the various ways in which things were defined in the past, and the various relations they enabled?' (van Oyen 2013: 81). The function of a mortarium, for example, is not fixed at the point of creation. It is clear that, while the presence of trituration grits and a spout means that it is undoubtedly an excellent tool for processing oil and herbs, residue and visual analysis has suggested that mortaria may have been used in a number of different activities associated with the preparation and cooking of food (Cramp et al. 2011: 1341). Some archaeologists have, for example, argued that it was its form (not the 'normal' function) which resulted in it becoming one of the most commonly-adopted types of pottery on farmsteads in *Britannia* (Cool 2004: 32). The final section of this paper will, following this argument, consider how by considering the presence/absence of particular forms of pottery we might, ultimately, be able to move towards a more balanced, 'thing'-driven appreciation of everyday life in Roman Cumbria.

In contrast to the pottery assemblages at forts, *vici*, and the *civitas* at Carlisle, those at farmsteads in Cumbria appear relatively conservative; there is site-by-site variation, of course, but all reveal an apparent preference for jars, pots, and bowls (Peacock in prep.). Why is this? The fact that pottery is so rare suggests that the small number of forms likely fulfilled multiple functions. Yet we need to take into account that while form does not equal function it still influences it; the fact that a bowl provides 'easy visual and physical access to contents' means that, in comparison to a jar or pot, it was more likely to have been used in the consumption of food and/or drink (Anderson 2012: 99). A typical interpretation for the prevalence of bowls, for example, is that this it indicates a continuing tradition of communal consumption in the North of England (Ross 2009: 165). A lack of Iron Age evidence in Cumbria means that this assertion is heavily dependent on analogies drawn from the North East, however the spatial proximity of the region and the equally conservative nature of many rural pottery assemblages (Anderson 2012: 156; Ross 2009: 182-183) justifies us using them as a tool to explore the issue in more detail. The fact that the North East has a 'native' pottery tradition is particularly beneficial. Here, 90% takes the form of jars and 10% bowls, and the fact that bowls are a late development has been interpreted as evidence for a change in the value attributed to materials; that, as ceramics became more widely available, it became increasingly acceptable to eat and/or drink from ceramic vessels instead of those made from non-ceramic materials (e.g. wood) (Anderson 2012: fig. 2.12: 101; 103-105). This implies is that *form* was the primary motivation behind the production (or selection) of pottery in the North East, and it can be argued that similar forces likely informed consumer choice in Roman Cumbria. In this case a mortarium on a farmstead might appear anomalous. Its relative ubiquity in the North of England has resulted in the hypothesis that it was used as a large bowl (Cool 2006: 45) and, if we embrace the idea that its functional fluidity led to its popularity, and disregard its characteristic trituration grits and spout, we can add weight to this theory. So, when is a mortarium not a mortarium? In Cumbria, at least, it may be: 'when it is a bowl'.

Conclusion

The process of archaeological interpretation is complex as it requires us to transcend past and present, and to situate ourselves within a society very different to the one we live in today. This paper has highlighted the importance of being aware of these complexities. Through a consideration of a single pottery form (the mortarium) it has demonstrated how, by appreciating that its function is inherently fluid, we can provide evidence to support the assertion that its popularity in *Britannia* was a result of its form and not its 'normal' function (i.e. the processing of oil and herbs) (Cool 2004: 32). It has also emphasised how important it is not to use analogies as a source of explanation; instead, if we show that they are carefully selected, we can strengthen our justification for their use (i.e. as a source of inspiration) (Wylie 1985: 107). This paper argues that, if we do so, this will enable us to make more balanced, well-informed inferences about everyday life in Roman Cumbria.

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Technical Weakness or Cultural Strength? Shapeless Jars in Iron Age East Yorkshire

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The remains of the so-called Arras culture of middle Iron Age East Yorkshire have been a much discussed topic among scholars of the Iron Age since systematic archaeological investigation began here during the nineteenth century. This paper opens with a brief summary of scholarship on the Arras culture and ways in which considerations of such a culture have contributed to understandings of Iron Age society in the region. It will then describe an alternative approach to the material culture of the region that seeks to provide different perspectives on its Iron Age society, before presenting a case study which looks at cultural tradition in the region through a class of ceramics known as Shapeless Jars.

Looking at the Wolds of East Yorkshire from an aerial perspective (e.g. Stoertz 1997) reveals a palimpsest of later prehistoric activity on a monumental scale. The landscape is criss-crossed by an extensive series of linear earthworks dating from the Bronze Age to the Romano-British period (Giles 2012: 44-45), interspersed with many barrows of Bronze and Iron Age date. The visible upstanding remains of this later prehistoric activity attracted the interest of antiquarians during the 18th century, and the rich burial goods sometimes found within the barrows led to extensive barrow digging, which was prevalent across Britain as antiquarianism became a popular pastime (e.g. Marsden 1999). During the 19th century, early archaeologists such as John Mortimer and Canon Greenwell pioneered more methodical examination of these monuments and began to share their findings in publications and museums (Giles 2012: 5-6). Archaeological investigations in the region have uncovered an unusual and distinctive burial rite dating to the middle Iron Age, unique in Britain, where inhumation burials were set within large cemeteries of square-ditched barrows (e.g. Stead 1965, 1979, 1991). Also associated with this rite are occasional cart or chariot burials, 20 of the 21 known British examples of which are located in East Yorkshire and its bordering counties (Giles 2012: 190, figure 6.3). Present in the inhumations, particularly in the chariot burials, is a rich array of burial goods. Items of La Tène decorated metalwork, weapons and chariot fittings, for example, have been excavated from within burials, and the quality and uniqueness of some of these items, such as the Kirkburn Sword and 'The Bean Tin', have made them iconic within both popular and academic accounts of Iron Age Britain. This tradition of inhumation burials has historically been seen as representing the remains of a distinct culture, whose markers are "(i) large cemeteries of small barrows, (ii) some barrows defined by square-plan ditches and (iii) some barrows covering vehicle burials" (Stead 1979: 11). This culture has been called the Arras culture, after its type site, a cemetery excavated between 1815 and 1817 (Stillingfleet 1846; Stead 1979: 8).

Soon after the idea of the Arras culture was established, considerations of its origins became a talking point (Giles 2007:103), and have had a significant effect on the way East Yorkshire has been incorporated into wider models of the European Iron Age. While the practice of inhumation burial within square-ditched barrow cemeteries is unique to the Wolds in Britain, evidence for comparable practices on the continent has been used to produce and support theories of cross-channel migration into East Yorkshire (e.g. Stead 1965, 9-17). The idea of invading warriors from the continent became an important element of the models of the British Iron Age that dominated the study of the subject during the first half of the twentieth century. Christopher Hawkes proposed, as part of his famous ABC scheme (1931), that a Northern Iron Age B contingent entered Britain during the early fourth century from Gaul, invading Yorkshire and spreading

South and West to link with the Southern contingent via the Jurassic zone. Despite criticism of Hawkes' model and a general move towards theories of more insular development in Britain (e.g. Hodson 1960), the unusual nature of East Yorkshire's Iron Age means that questions about continental contact have remained at the forefront of discussion. Peter Halkon's recent volume on The Parisi (2013), the group occupying East Yorkshire during the pre-Roman and Roman periods, renews the discussion of whether the Parisi of East Yorkshire were connected with the Parisii of Gaul, referred to by Caesar (*Gallic Wars* 4:3). Mel Giles, referring to the question of the nature of links between East Yorkshire and the Champagne region, had written several years earlier that "this question is a non-question" (2007: 105), arguing that this debate has had its time. Related research, however, is still being carried out (e.g. Anthoons 2011; Jay *et. al.* 2013), demonstrating its continued relevance.

In addition to the role of East Yorkshire's middle Iron Age burial rite in formulating theories of contact between Britain and the continent during this time, certain aspects of the material culture of the inhumation burials have also been important in dictating the way that the structure of society within the region has been envisaged. The existence of chariot burials, and other rich burials, set apart from the 'bulk' of individuals has led to suggestions that an elite social class existed in the region as part of a social hierarchy, and that these rich burials were a means of expressing the wealth of this class (Sharples 2010: 242). Recent work on the complex meanings of the rich grave goods of East Yorkshire (Giles 2012) and the possible existence of heterarchical societies in the Iron Age (Hill 2011), however, suggests that the re-examination of this view may benefit understandings.

It is clear that there is much investigation left to be undertaken on the origins and nature of what is termed 'the Arras culture' and that the questions outlined above are likely to remain at the forefront of studies of Iron Age East Yorkshire. One could argue, however, that the Arras culture burial rites and the associated metalwork have come to dominate somewhat disproportionately the Iron Age archaeology of East Yorkshire. While the intricate metalwork and its deposition within burials, particularly chariot burials, presents a rare and fantastic opportunity to study Iron Age art and craft and the way this relates to buried individuals, I argue that giving more consideration to other aspects of the archaeological record could improve understandings of the way these objects functioned in society prior to deposition. Despite the wealth of metalwork found in graves, the most common grave goods were plain ceramic jars (Giles 2012: 132), and these are the objects on which the rest of this paper will focus.

This paper represents the early stages of PhD research which aims to analyse the aesthetic qualities not only of those exceptional objects that have seen so much attention in the past, but of the full repertoire of objects that people living in Iron Age East Yorkshire will have come into contact with on a daily basis. Through seeking out a fuller, more textured picture of the 'aesthetics of the everyday', it is hoped that a more nuanced understanding of the materials and objects that people were coming into contact on an everyday basis might be gained. This may increase understanding of what the exceptional metalwork and burials of the so-called Arras culture actually represent in terms of the lives of individuals.

The first step in this process has been to research the aesthetics of ceramic vessels in the region. The remainder of this paper will summarise my findings during this process and the implications they have for the study of everyday aesthetics in Iron Age East Yorkshire. The sample of ceramics analysed for this paper was derived from Valery Rigby's 2004 publication of the results of the British Museum East Yorkshire Settlements Project 1988-1992; *Pots in Pits*. The project was aimed at identifying and excavating settlement sites on and around the Wolds with the aim of balancing the focus of research in the region, which, as stressed above, had largely focussed on Arras cemetery sites up until this point. Potential sites were identified through aerial photographs and geophysics was used to target areas for excavation. Pits were by far the most frequently identified and excavated feature, containing what could be interpreted as dumps of domestic rubbish, but which, in some cases, seem to have been placed in a specific way, rather than being simply discarded (Rigby 2004: 182). Sections of enclosure ditches were also excavated, which

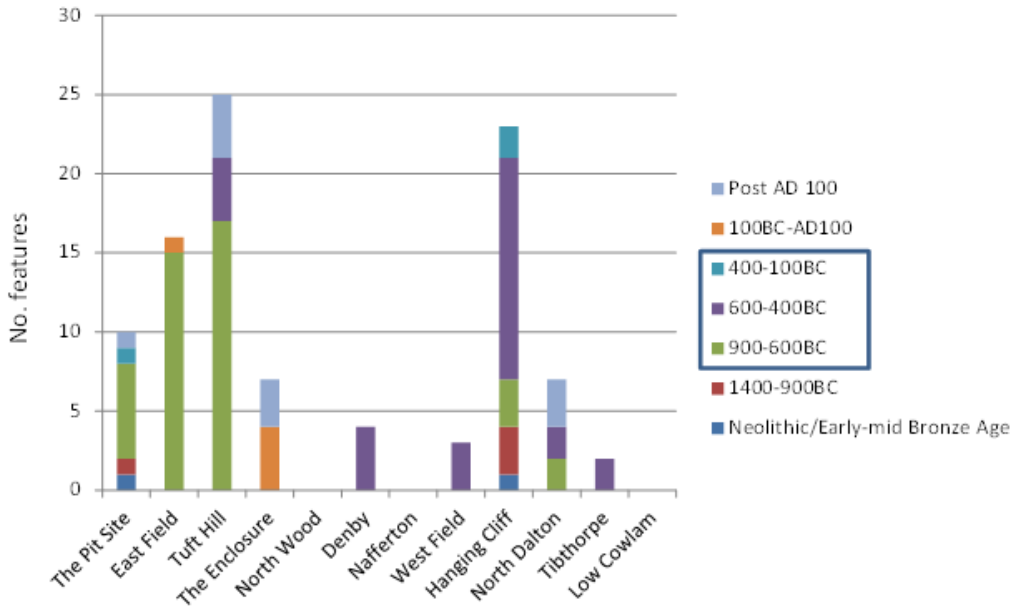

Figure 1: The dating of features excavated during the British Museum Yorkshire Settlements Project (data from Rigby 2004). The sample for this paper is shown within the blue box.

allowed the determination of phasing and illustrate the fact that many Bronze Age and Early Iron Age sites had been returned to and enclosed during the late Iron Age and Romano-British periods. The published volume summarises the findings of the project, but does not look at any patterns relating to aesthetic design or the wider regional context of the material in any detail. The material culture generated from the project was dated by Rigby, using a typological scheme applied to the pottery, which was by far the most frequent find. While support from additional data would benefit this scheme, I have used it in this instance to define a sample of pottery for this initial stage of investigation (Figure 1).

Ceramics dated to the period 900-100 BC were selected for investigation during this stage of the project. This is due, in part, to the material present, most of which dates to the earlier half of this period (900-400 BC). The date range has been extended to 100 BC in order to take in the ceramics produced during the period during which the practices associated with the Arras culture were occurring in the region. An advantage of being able to investigate ceramics over an 800 year period is that long term change can be investigated. Mel Giles, in her work on identity in Iron Age East Yorkshire, argues that a key consideration in the formation of relational identity is the concept of time; how people's actions fit into memories of the past and predictions of the future (2007:106). Looking at the long term development of ceramics in Iron Age East Yorkshire will allow me to begin to suggest not only what ceramics were like during the Arras period of 400-100 BC but potentially *how* and *why* they were as such through the consideration of the role of memory in the everyday 'taskscape' (Ingold 1993).

Investigating change in Iron Age East Yorkshire through Shapeless Jars

The name 'Shapeless Jar' was first used by Ian Stead (1991: 100-101) to refer to vessels recovered from Arras cemetery graves, but has since been taken up to describe more generally plain vessels from all context types within the region (see Figure 2). Archaeologists have tended to focus on the lack of technical skill and design flare employed in the making of the jars. Sharples, for example stresses their plainness, drawing a direct comparison between the ceramics and contemporary metalwork, which is used to emphasise his point:

> *"...the elaborate decoration of objects, such as the Kirkburn Sword, is associated with ceramic vessels that have been crudely made, have little formal variety and are completely undecorated" (Sharples 2008: 209).*

Rigby focusses on the basic technical skills of the potters without openly making the comparison:

> *"They are typically minimum input vessels, proportionally thick-walled for their size, where little effort was made to finish surfaces and mask the inclusions. Firing was uncontrolled in an open fire." (Rigby 2004: 47).*

The weaknesses of Shapeless Jars, particularly when contextualised by comparing them to metalwork have, historically, fed into the wider interpretations of the arrival of the Arras culture in East Yorkshire that were described earlier in this paper:

> *"...the Iron Age B warriors who invaded East Yorkshire did not introduce the beautiful pottery of their homeland. The pots buried with them are crude things made by the native women whom they had subjected, which reflect the Iron Age A tradition of the natives who still formed the bulk of the population." (Brailsford 1961: 93).*

While the Shapeless Jars written about in the above quotes are indeed, plain, undecorated and fired at low temperatures, critical assessments of their aesthetics do not necessarily add to understandings of their roles in Iron Age society and, importantly, in graves. In particular the comparison of plain jars with elaborate metalwork may be one that, overall, is not relevant or helpful, due to the differing functions and contexts of these two categories of object. I argue that a consideration of *why* the ceramic vessels of East Yorkshire are so plain might bring further understanding to the way in which Arras culture burial rites and the associated metalwork function within wider activities in the region during the Iron Age. Can plain pots be seen as being part of a suite of material culture associated with Arras culture burials and if so, why is there such a contrasting aesthetic between pots and metalwork? The remainder of this paper will investigate long term, gradual changes in potting practices in Iron Age East Yorkshire, through a focus on Shapeless Jars and the origins of the 'Arras aesthetics' of fancy metalwork and plain pots.

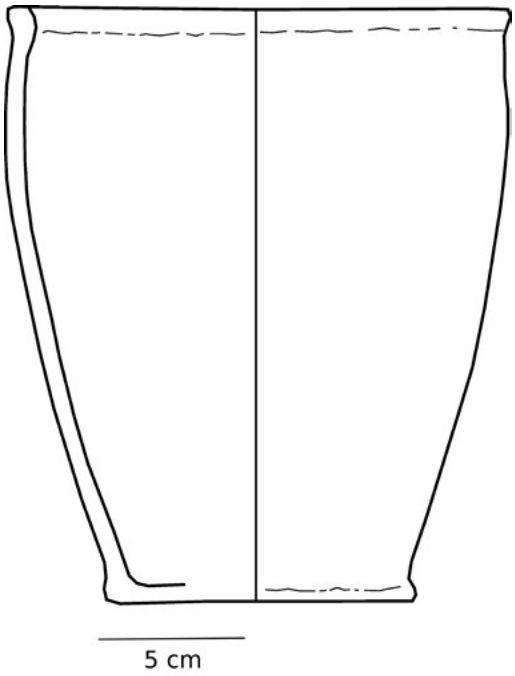

Figure 2: A Shapeless Jar from Hanging Cliff, Kilham (Pit HA29). The author after Rigby (2004), scale added by author.

Changing Ceramic Forms

The data presented below is taken from Rigby's *Pots in Pits* volume, mentioned previously. The changing proportions of different forms were investigated. As specified above, the date parameters of 900-100 BC were put in place (split into three periods: 900-600 BC, 600-400 BC and 400-100 BC).

A key observation made during the process of initial research was the decreasing range of forms present in the entire body of Rigby's excavated material from the Late Bronze Age. The table below (Figure 3) shows the typological groupings used by Rigby dating to 900-100 BC and the types of vessels that fall within each of these groupings.

Typological Grouping	Date range	Vessels present
c.	850-800BC	Thin walled, tripartite or waisted biconical vessels
d.	900-600BC	Jar and bowl forms with carinated shoulders.
e.	850-600BC	Carinated bowls/jars. Sloping slashes/fingernail notched decoration.
f.	600-400BC	Round bodied jars. Lid-seated/convex/everted rims.
g.	400-100BC	Shapeless jars

Figure 3: A table showing the decreasing variety in vessel forms in Rigby's typological groupings (data from Rigby 2004).

During the period 900-600 BC, it appears there are a wide range of different vessel forms present, contained within three typological groupings. During 600-400 BC, just one typological grouping is present, and contains a more standardised set of jars with specific rim types. The period 400-100 BC, during which time Arras culture characteristics are appearing in material culture elsewhere in East Yorkshire, sees the production of only one type of vessel, the Shapeless Jar. The general picture appears to show a move from varied, elaborate (and sometimes decorated) pot forms, towards standardised, very plain vessels.

More focussed research was required and changing form was then investigated on a site-by-site basis. Hanging Cliff, Kilham, has been chosen as a short case study for this paper, due to the fact that this site has the longest continuous occupation of any of Rigby's sites, so can be used best to represent long term change.

The name used to describe each named vessel for the periods 900-600 BC, 600-400 BC and 400-100 BC was recorded and the frequency of different vessel types for the three sub-periods was recorded and is displayed in the graph below (Figure 4).

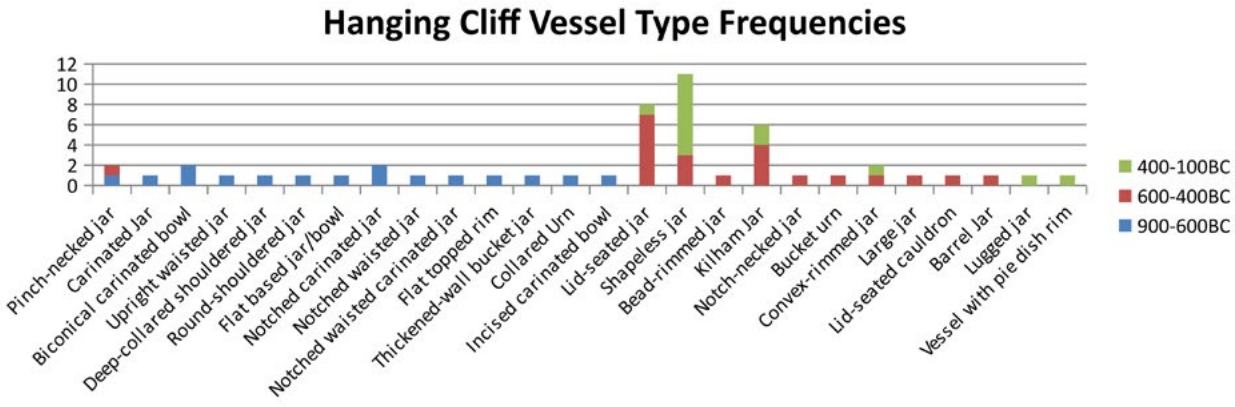

Figure 4: Ceramic forms at Hanging Cliff between 900 and 600 BC (data from Rigby 2004).

The graph above shows the changing proportions of vessel types at Hanging Cliff over time. It indicates a great diversity of vessel forms in features dated to the period 900-600 BC with barely two vessels being described in the same way. The period 600-400 BC, sees increasing standardisation, with Lid-seated jars and Kilham Jars beginning to dominate the assemblage. The much smaller range of vessel forms from features dated to 400-100 BC illustrates the domination of the assemblage by Shapeless Jars and the decline of other vessel forms. This might be interpreted as a loss of the technical skill or design skills used to create the earlier, more variable forms, or a more standardised mode of producing pots.

Looking at the wider assemblage excavated by Rigby, however, reveals local variations in the way in which vessel forms change over time. The percentages of vessels listed as Shapeless Jars in the Burton Agnes locality, around 5 km east of Kilham, were recorded. The sites located here; The Pit Site, East Field and Tuft Hill, were occupied during the early part of the period I am focussing upon, with the main phases of occupation occurring during the period 900-600 BC.

Site	% Shapeless Jars	
	900-600BC	600-400BC
	Total vessels 141	Total vessels 23
The Pit Site	8%	0%
East Field	20%	(no features dating to 600-400BC)
Tuft Hill	13%	9%

Figure 5: The percentages of Shapeless Jars recorded at sites in the Burton Agnes locality (data from Rigby 2004).

The table above (Figure 5) shows that, while at Hanging Cliff, Shapeless Jars are not present until the later periods represented, at the Burton Agnes sites they are actually fairly frequent during the earlier periods. This may suggest that Shapeless Jars were actually a constant presence in East Yorkshire during the period 900-100 BC, with proportions fluctuating differently at different sites. Although Rigby does allude to the presence of Shapeless Jars outside typological grouping g. (400-100 BC) (2004: 38), this is not reflected in the groupings. It appears almost as if Shapeless Jars have simply been obscured by fancier forms during periods where they exist alongside one another.

This changes the nature of the question being asked regarding the increasing plainness of pots. It seems that, perhaps, rather than pots becoming plainer, what is visible in the archaeological record is simply a decline in fancier forms, while Shapeless Jars, which have been present all along, simply remain a part of the ceramic repertoire. It is possible, then, to begin to see Shapeless Jars not as evidence of technological weakness in the potting sphere, but as a long-term survival or cultural tradition.

Tradition and Identity

Colloquially, the word 'tradition' tends to have implications pertaining to ideas of old-fashioned-ness or of the past. Timothy Pauketat's work on the subject, however, emphasises the dynamic nature of tradition in the present. "A tradition is some practice brought from the past into the present" (Pauketat 2001: 2), and therefore requires active reinterpretation and perpetuation by people in the present.

Recent explorations of identity have tended towards the idea that identities are formed through action and movement in the world (Giles 2007; Ingold 2011, 2012; Jones 2012). Conceptions of communal identities

in Iron Age Britain have been harnessed in the past to wider models of Celtic diffusion and characterised by chieftain models (Giles 2008: 333-340), which represent an example of what Ingold (2011: 157) refers to as genealogical models of identity, where cultural identity is simply 'inherited'. Newer models, however, see identity as being produced through practice and constituted through the making and unmaking of relations with people, things, materials, animals and places It is an "ongoing project", a "perpetual unfolding of capacities and properties" (Giles 2007: 105). Taking these ideas further, Andy Jones (2012: 105) has recently written that "categories are performed", and that the repetition or reiteration of performances produces differences in categories. Thus, it is possible to see that the perpetuation of a tradition, such as repeatedly producing shapeless jars, might constitute both the building of 'individual' identities, anchoring them to the past, and the production of a social or cultural category, perhaps a communal regional identity.

Concluding points

This paper began by summarising the study of the Arras culture by archaeologists and the Arras 'package' of square barrow cemeteries, chariot burials and elaborate metalwork. Plain pots could also be seen as being part of this suite of cultural features, presenting a stark and puzzling contrast with the intricately crafted metalwork. It has been shown, however, that Shapeless Jars pre-date those practices associated with the Arras culture and may represent the survival of a robust, long term tradition in the face of cultural change. This begins to add nuance to the way in which we understand the potential arrival and assimilation of cultural practices into East Yorkshire during the Iron Age and the social roles of material culture.

It seems that, despite appearances, not only are Shapeless Jars worthy of in depth study, they may represent a key way in which identity was produced and maintained in later prehistoric East Yorkshire at several different scales. Although Shapeless Jars have traditionally been categorised by archaeologists as evidence of technical weakness among potters, I argue that they may in fact represent a strong cultural tradition. This, however, is just one possibility and it is hoped that further holistic research into the material culture of the region will add further texture to the existing picture of the design and production of a distinctive aesthetic tradition.

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Divine Horsemen: equine imagery in Iron Age chariot terrets

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Chariot terrets, or rein-guides, are among the most common copper-alloy artefacts known from Iron Age Britain. A set of usually five of these sturdy rings would be set along the yoke of a chariot drawn by a pair of horses, each fixed upright with its attachment bar parallel to the yoke. The reins would pass separately through the terrets, a system which prevented the reins from becoming tangled between the bridle bits and the hands of the driver. Terrets of various form are found on Continental Europe, but the series of "D-shaped" terrets – terrets which comprise a rounded main ring distinguished by a pair of moulded terminals from a roughly straight attachment bar – is unique to Britain, and was current from probably the third century BC until at least the late first century AD.

The purpose of this paper is to place the D-shaped series of British terrets within the broader context of Celtic art. Some terrets are relatively plain but others are highly ornate, while many, it will be argued, incorporate elements of equine imagery into their design. The paper will also consider how we, today, understand the symbolic significance of the horse in Iron Age society, and how this might affect our interpretations of the *image* of the horse in Iron Age material culture.

Niall Sharples (2008: 206) has claimed that, in the context of Celtic art, it is important to distinguish between form and decoration, and that "form is as much an artistic expression as the appearance and complexity of decoration". This is true in the case of terrets, where there is great variation between forms. Quite aside from the decorative mouldings, incisions and enamels which embellish the rings of many terrets, the rings themselves occur in a range of shapes and sizes, and there is considerable variety among styles of terminal and attachment bar. These are not decorative elements, but part of the terret's basic structure. While bars and terminals have a practical application, allowing attachment to the yoke, the diversity in their form and style can be seen as an expression of artistic or at least aesthetic rather than solely functional intent. Where additional ornamentation is concerned, a study by the author (Lewis 2015: 141-142) of terrets from western and central Britain found that within the study area, of 337 D-shaped terrets of identifiable type, only around 60 are completely lacking decorative modification. We can reasonably conclude that D-shaped terrets are artefacts designed with visual appearance and tactility as well as purpose in mind.

A classic characteristic of Celtic engraved art is the interaction between lines and circles and the inclusion of sinuous motifs, resulting in an impression of fluidity and movement with "no simple beginning or end" (Garrow and Gosden 2012: 317). These techniques are displayed on many of the more ornate Iron Age terrets, most obviously on those of crescentic form: terrets with a broad, flat ring enamelled on both sides. D-shaped terrets with more usual round-sectioned rings can also be embellished with curvilinear incisions and enamelled cells. However, Spratling (2008: 194) points out that alongside this abstract pattern, Celtic art is now recognised to be "full of visual imagery". In terrets, images of foliage are relatively common: a terret from Cold Kitchen Hill, Wiltshire (held in the Wiltshire Heritage Museum, Devizes, accession no. DZSWS:1972.15; Figure 1) is set around the ring with three pairs of moulded wings, on the faces of which are inscribed small leaves, schematically presented. (The "leaves" here arguably stand in contrast to other, less directly representational work found on the same terret, including incised triangles, semi-circles and "hour-glass" motifs.) A number of terrets are embellished with sets of small "clustered knobs" around the ring, which can be seen as clusters of berries or grapes (e.g. LVPL2100 and LVPL2101 on the Portable Antiquities Scheme database, both from Tattenhall, Cheshire). Cunliffe and Poole (2000: 47-50) describe two of the terrets from Bury Hill, Hampshire as "rosette and tendril decorated", and one of them as also featuring a "bud". Berried rosettes are a recognised feature of

later Iron Age art (MacGregor 1976: xix; Megaw and Megaw 1989: 228). Enamelled cells are arranged in petal-like formation on the platforms of terrets such as that from Butler's Field, Lechlade, Gloucestershire (now held at Corinium Museum, Gloucester, accession no. 1997/25/164/16; Boyle *et al.* 1998: 123-124, fig.5.95 (16)), and those from the Saham Toney hoard, Norfolk (now held at Norwich Castle Museum, accession nos. NWHCM: 1847.66.2: A, NWHCM: 1847.66.3: A and NWHCM: 1847.66.4: A; *Norfolk Archaeology* 1849: figs.6-8). Bishop and Coulston (2006: 121) relate the vine tendrils, leaves and bunches of grapes that often embellish Claudian cavalry equipment to the association between Bacchus and horses, but this particular association may be unlikely in the context of British harness-gear, in which the earliest floral imagery considerably pre-dates the Roman invasion.

Figure 1: Terret from Cold Kitchen Hill, Wiltshire. Image by the author, reproduced with permission of Wiltshire Museum, Devizes.

Celtic art also contains imagery at a less literal level of representation, in which the object depicted is broken down, with particular elements of its nature emphasised. The repoussé bronze plaque from Llyn Cerrig Bach, held at National Museum Wales, Cardiff (accession no. 44.32.75; Figure 2) presents us with an example of the subjectivity that can come into play when we try to interpret imagery of this kind from a modern standpoint. Spratling (2008: 194-195) notes that the decoration on the plaque was read by Cyril Fox in geometric terms (as an "asymmetric triskele"), while more recent commentators, such as Jope, have seen birds' heads, specifically puffins. Spratling himself reads the decoration as "a horse on the move", and makes a convincing comparison with the stylised depictions of horses on East Midlands staters (Spratling 2008: figs 10.5 and 10.6). The curving, elongated shapes that comprise this pattern could also be compared to the leaves and tendrils inferred from several of the terrets mentioned above. It seems likely that the design is deliberately ambiguous, suggestive at the same time of plants, land-animals and birds, of the different elements (earth, air, water) they inhabit, and of the different shapes they cast in motion.

Figure 2: Close-up of detail on crescentic plaque from Llyn Cerrig Bach, Anglesey. Image © National Museum Wales – Amgueddfa Cymru, reproduced under the terms of the Creative Archive Licence of the People's Collection Wales.

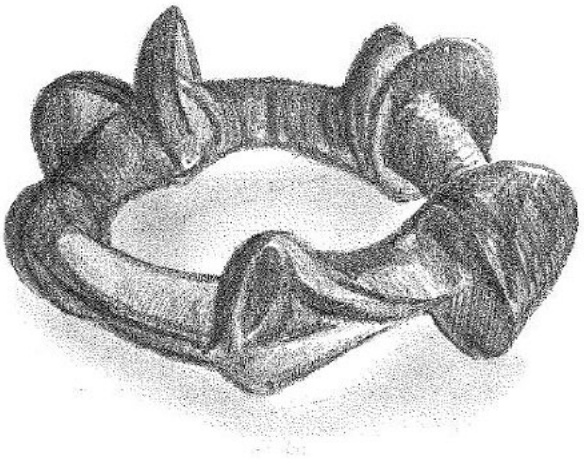

Figure 3: Close-up of detail on terret from the Polden Hills hoard, Somerset. Image by Philippa Lewis.

Figure 4: Close-up of detail on terret from the Polden Hills hoard, Somerset. Image by Philippa Lewis.

On one particular terret from the Polden Hills hoard, Somerset (Brailsford 1975) – now held at the British Museum, registration no. 1846,0322.100 – the shape of the ring has been embellished through moulding and incision to create the clear impression of a horse's face (Figures 3 and 4). The terminals taper away towards the underside of the bar so that, when viewed sideways-on, each terminal has the appearance of a pair of flared nostrils. Above the nostrils, on each side of the ring, are two sweeping triangular cells with traces of red enamel, surrounded by hatched borders: these have the appearance of eyes surrounded by lashes. The ring is keeled, with a band of pseudo-stitching running down its spine, which here helps to form the image of a long, narrow face, quite similar to that on the famous horse-mask from Stanwick/Melsonby (Figure 5).

Equine imagery can also be found in the basic shape of some terret rings. A good example comes from Silverdale, Lancashire: LANCUM-701EE1 on the Portable Antiquities Scheme

Figure 5: "Horse-mask" mount from Stanwick/Melsonby, North Yorkshire. Image © Trustees of the British Museum, reproduced under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence.

database (Figure 6). This is a simple terret and otherwise undecorated (grooved terminals notwithstanding), found in possible association with a hoard of Roman coins and copper-alloy horse-gear (PAS reference LANCUM-009B63). The lower portions of the ring and the terminals together give the impression of a horse's ankle and foot, formed by the steep angle at which the underside of the ring rises, requiring it to kink inwards slightly in order to continue its curve. This calls to mind a horse's fetlock, while the terminal – the underside of which is slanted at the same angle as the lower ring – is reminiscent of a hoof. The overall impression is heightened on this example by the degree of wear inside the lower portions of the ring, but while wear is not necessarily deliberate it would nevertheless have been expected, and perhaps anticipated in the ring's design.

Figure 6: Terret from Silverdale, Lancashire. Image © Portable Antiquities Scheme/British Museum, reproduced under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence.

Another distinctive example comes from Longdon, Staffordshire – DENO-679BE6 on the Portable Antiquities Scheme database – in which the lower portions of the ring are especially bulbous. This imagery can be encountered in many D-shaped terrets; generally, the visual relationship between ring and terminal can quite reasonably be said to mimic that between a horse's foot and hoof. Of course, much of the abstract imagery we encounter in Iron Age harness equipment is subjective in nature, and depends upon perspective: some individuals will recognise distinct images where others will not. This will have been the same during the Iron Age, and the fact that particular images can rarely be identified with objective certainty should not undermine the importance of artistic suggestion.

Equine imagery in harness-gear is not restricted to terrets, and nor is the imagery in harness-gear limited to horses. Jennifer Foster (2014) has identified 23 examples of Iron Age British champlevé harness-gear in which human and animal faces can be seen, although she acknowledges that not all of these faces – or impressions of faces – may have been intended by the maker, or recognised by those who used the artefacts. Foster finds faces in eight terrets (Foster 2014: nos. 14-21, fig. 5), mostly crescentic varieties. In most cases the faces are identified entirely from within the enamel, although in several examples the open space at the centre of the terret is interpreted as the mouth. Often the face is represented by rather generic features – round eyes, a triangular nose or mouth – that do not recall any particular creature, but on several examples Foster points out a "duck's head" motif: an enamelled detail with the shape of a compressed teardrop, beaky at one end, and containing a large central circle, as though an eye.

A horse-bit with a moulded human face decorating the side-link is known from Ireland (Raftery 1974); here, when we consider the account within the Ulster Cycle of Cúchulainn carrying the heads of the sons of Nechtan Scéne in his chariot, the association between harness-gear and the human head might take on an additional, macabre significance (Melanie Giles pers. comm.). Mortimer (1905: 360, fig.1022) suggests that the bottom end of a linchpin recovered from the Market Weighton chariot burial resembles the head of a "horse or dog". Spratling (1972: 58) has shown that on some vase-headed linchpins, the foot is "shaped like the upturned hoof and fetlock of a horse", an observation previously made by Greenwell (1906: 280) with regard to the terminal of a linchpin from the King's Barrow chariot burial. The bulging "ankle" on these linchpins (e.g. Spratling 1972: nos. 109, 111) makes the impression of a fetlock even more pronounced than it is on terrets. Intriguingly, the copper-alloy linchpins from Kirkburn (Stead 1991: figs

Figure 7: Linchpin from Kirkburn chariot burial, East Yorkshire. Image © Trustees of the British Museum, reproduced under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) licence.

37.1 and 38.1; Figure 7), two others with fetlock-like feet, both bear on the face of each terminal a relief triskele motif reminiscent of that from the Llyn Cerrig Bach plaque into which, as we saw above, Spratling (2008: 194-195) reads a "horse on the move".

If we accept the notion that terrets and other forms of harness-gear can be invested with equine imagery, then we might wonder what ideas are being communicated through this aspect of their design. Does it simply reflect the functional association between harness-gear and horses, or is there something more significant inherent in the image of the horse? Horses or horse-like creatures are depicted relatively prominently in Iron Age art: on the Aylesford and Marlborough cremation buckets (Evans 1890: pl. XIII), for example, and by the vast chalk horse cut into the hillside at Uffington. There is also archaeological evidence, especially from Wessex, to suggest that the horse was an exceptional animal in Iron Age society. In his analysis of human and animal remains from Winall and Danebury, Richard Madgwick (2008: 104-105) has shown that there was a clear and deliberate distinction in the treatment of horse and dog remains compared with those of other animals, indicative of greater sub-aerial exposure. This might relate to the fact that horses and dogs were not staple sources of food (Madgwick 2008: 110). Noting that most horse remains from the early and middle phases of occupation at Danebury were from mature animals, and that the vast majority from all phases of occupation were from males, Grant (1984: 224) suggests that horses might have been rounded up sporadically from feral herds rather than bred in the community, and might consequently have been regarded as "set apart". A similar conclusion was reached by Harcourt (1979) with regard to Gussage All Saints.

J.D. Hill (1995: 107-108), in his investigation into the content and structure of special deposits in Iron Age settlements from Wessex, finds that while there are differences between the ways in which human and animal remains were deposited, humans were not "radically distinguished" from animals. Within special deposits, the treatment – in terms of spatial distribution and material associations – of human remains is closest to that of horse and dog remains. It is less similar to the treatment of the remains of heavily domesticated animals – cattle, sheep and pig – and also of wild animals, which might suggest that humans, horses and dogs were "on the boundary between the domestic and the wild" (Hill 1995: 107). Cunliffe and Poole (2000: 80-81), noting the high proportion of horse bone at Bury Hill and the emphasis on horse-trappings within the pit deposits, posit that the horse and chariot played major roles in both the social system and belief system of the site's occupants; Cunliffe (1995: 37) has argued elsewhere that at times of social unrest during the Late Iron Age, the horse-drawn chariot may have been important "both as a symbol of prestige and as an instrument of war". Although much of this material relates to Wessex, the famous chariot burial rite of East and North Yorkshire (see Giles 2012; Jay et al. 2012; Stead 1979: 1991) is evidence that the horse also played a significant role in Late Iron Age societies further afield.

Creighton (2000: 26) notes that in the late second and early first centuries BC, "virtually everywhere throughout northern Europe coins appeared in a variety of styles, but almost all of them had in common a horse on one side and a [human] face on the other". This is partly because most northern European coinage derives from the gold staters of Philip II of Macedon, which depict the head of Apollo on one

side and a two-horse chariot on the other; however, Creighton argues that the endurance and popularity of the "duality" of the "man/horse" image reflects the position of the horse as a symbol of authority in Iron Age society. Creighton (2000: 22-24) relates this symbolism to the concept of sacral kingship: the Celtic notion that a king or leader is invested with power by the forces of the natural world, and that the success or prosperity of a reign is dependent upon the union between king and earth. Certain medieval Irish texts describe rituals in which a king is "married" to the earth; horses sometimes play a central role in these ceremonies. Although we cannot specifically trace this concept to the Late Iron Age, Creighton (2000: 22-23) states that this "theme… has very firm roots in Indo-European 'culture'", and that in the context of the British Middle and Late Iron Age, "if any one thing symbolised the power of potential rulers and the leaders of comitates, it was the horse".

As a result of this combination of artistic and social prominence, the horse is often viewed as a creature of special symbolic importance in Iron Age Britain, "on the boundary between wild and domesticated animals, and between nature and culture", as the excavators of the Uffington horse have stated (Barclay et al. 2003: 246), echoing Hill (1995: 107). However, it is sensible to be cautious when seeking to interpret particular motifs within Celtic art – such as that of the horse – as plainly symbolic, or as possessing a specific meaning. Hill's (1995: 107) analysis of special deposits in Iron Age Wessex includes the caveat that certain remains – such as human, horse and dog – may have been classified and curated similarly, but for different reasons. Moreover, as we saw in the Llyn Cerrig Bach plaque, ambiguity is part of the character of much Celtic art: it may be reductive to say simply that, for example, the horse is a symbol of power, the chariot a symbol of prestige, or equine imagery in chariot-gear an attempt to identify the charioteer with the horse in an overtly totemic sense. It could be argued that the image of the Uffington white horse arcing across the Berkshire Downs has itself become so iconic and pervasive an emblem of Iron Age society and art that it has influenced the ways in which we interpret the significance of the horse. The image reminds us of human mastery over the land and, at the same time, of the mystery of human creativity; this perceived dichotomy between application and instinct within the creation of the artwork implies a dichotomy between culture and nature within the subject of the art. Although we see the artwork as capturing the significance of the horse, it may be that we have transferred onto the horse – to the Iron Age horse in general – certain properties of the art.

As a creature often depicted in an ambiguous fashion, or a hybrid state, can the horse really have held a fixed and constant symbolic meaning in Iron Age society? Vincent Megaw (1970: 22) has noted the important theme of shape-shifting within Celtic mythology: the phenomenon by which people, animals, plants and objects exchange forms. In a world "saturated with magic" (Megaw 190:22) personal identity and bodily integrity are fluid. With this in mind, we can perhaps see the incorporation of subtle equine, floral and other motifs into items of chariot- and harness-gear as a means of drawing together the horse, the charioteer, the activity of chariotry, the physical material of the chariot, and the chariot's terrain, into one physical and conceptual space. From this perspective, the equine imagery found on terrets does not so much represent or symbolise the horse as share in its nature.

Megaw (1970: 38) writes that "Iron Age and particularly La Tène art is predominantly a religious art… [it] employs an iconography which imbues even the simplest objects with a degree of the mysterious or indeed the divine". This arguably reflects a culture in which there is no hard and fast distinction between the secular and the sacred worlds, and in which – just as animals, people, plants and objects may shift and exchange form – the physical and the spiritual may be in constant interaction. This differs from a reading of Iron Age art and society which places the practical in opposition to the spiritual, or the cultivated in opposition to the innate. Whether in the subtle equine imagery incorporated into the form of D-shaped terret rings, or in the abstract impressions of motion and connection encouraged by the curvilinear designs of enamelled crescentic forms, it may be a perspective of inter-relation and fluidity that underlies the character of many British terrets. Rather than any rigid symbolism, it is perhaps this very changeability that is communicated through the artistic effort put into their creation.

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Note: Artefacts recorded on the Portable Antiquities Scheme database can be accessed online at www.finds.org.uk.

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Burials of Martial Character in the British Iron Age

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Introduction

The significance of the decision to bury an individual with martial objects during the British Iron Age cannot be overstated. It is a rare subset of funerary practice, conferred upon select individuals. This article examines martial burials, firstly summarising past research, then presenting an overview of martial object classes, and their treatments in funerary practice. There is a particular focus on the Arras Culture of East Yorkshire, which dominates the data due to the highly unusual, almost unique, ritual in which spears appear to have been thrown at the corpse as part of the funeral. The analysis presented here highlights the importance of non-offensive martial objects, and demonstrates that there is much greater diversity in Iron Age martial burial practice than previously recognised.

Past Research

In one of the most prominent analyses of British Iron Age martial burials, Collis (1973) catalogued 17 examples. Whimster's (1981: 129-146) survey of burial practices noted a sub-group of burials with swords. Johns (2002: 64-68) listed 36 British burials, which included swords or spears. Stevenson (2013) suggested there were 39 burials with weapons, and Sealy (2007: 33) stated that fewer than 25 warrior burials are known for England and Wales, excluding those with solely defensive equipment. These accounts reflect modern concepts relating to the importance of weaponry, especially offensive weapons, obscuring the nature and diversity of burials with martial objects for the British Iron Age.

Hunter's (2005) contextual exploration of warrior iconography on British Iron Age coinage rightly acknowledged the need to look beyond offensive weaponry, and expanded the corpus to 63 burials. Any truly comprehensive account must embrace all martial objects. This allows for a more nuanced exploration of the nature of these practices, possibly revealing expressions of social status and identity construction, which have previously gone unnoticed.

New finds have come to light since Hunter's review so that there would now appear to be at least 80 burials with martial objects confidently datable to the British Iron Age, a further 22 may have an Iron Age date (Figure 1). The full list of burials is included in a supplemental file for this paper. Giles (in preparation), exploring an entwined biographical perspective on the lives of individuals and weapons, will also provide an updated list. More than half of the positively identifiable Iron Age martial burials were discovered in East Yorkshire (Figure 2). The dominance of Yorkshire in the raw count of martial burials is largely attributable to the Arras Culture (Figure 3). Consequently, due to the Arras Culture's particular practice of burial as a majority funerary rite, a greater number of Iron Age burials have been recorded in East Yorkshire than anywhere else in Britain.

'Warrior' Burials with shield, sword and spear

Nine individuals were buried with the full complement of sword, spear and shield in Iron Age Britain. Five of these were Arras Culture burials. Elsewhere, two martial burials from Brisley Farm, the Owslebury Warrior and the Kelvedon Warrior round out the coterie of Britain's most equipped martial burials (Figure 4). The well-equipped double-inhumation cist burial from Camelon, Falkirk in Scotland, close to the Roman Fort (Breeze *et al.* 1976: 75) may be Romano-British.

FIGURE 1: SITES WITH MARTIAL BURIALS CONFIDENTLY DATED TO THE IRON AGE.

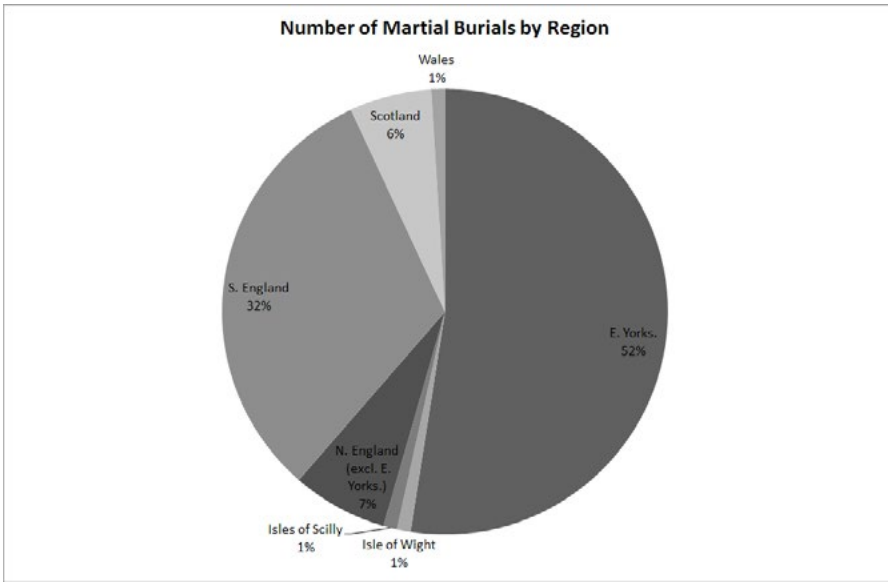

Figure 2: Number of Martial burials by County (confident and possible Iron Age burials)

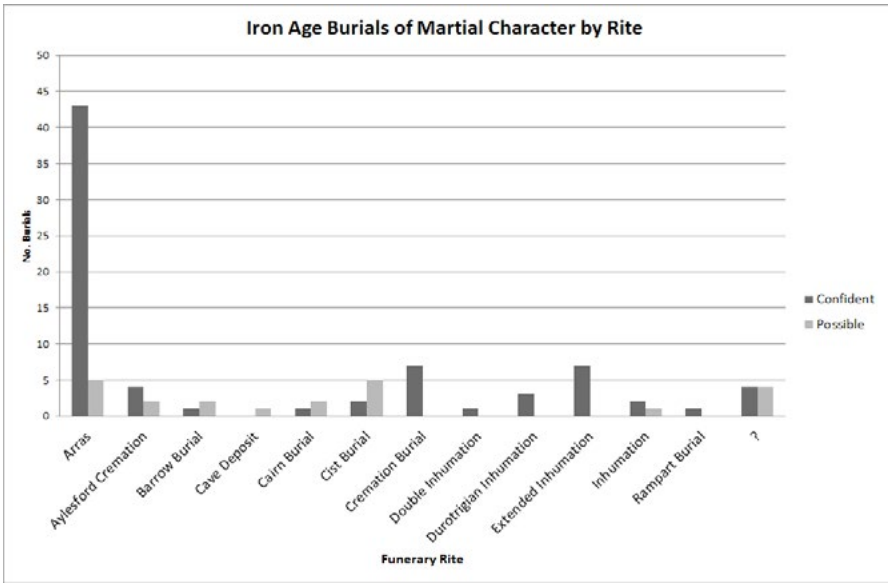

Figure 3: Number of Iron Age burials of martial character by funerary rite.

Similarities can be observed in the layout of these nine Iron Age 'warrior' burials. All are located in regions with close connections with the Continent via maritime and riverine routes (Cunliffe 2005). Five burials, Rudston R154, and R174, the two from Brisley Farm and the Owslebury Warrior, were extended, distinct from the usual crouched position. Grimthorpe was a supine flexed burial (Mortimer 1905: 150-152). Garton Station GS10 and Wetwang Cart Burial 1 were contracted with the head to the north (the normative Arras Culture rite). Unfortunately, it was not possible to identify the funerary rite or body position of the Kelvedon Warrior (Sealy 2007: 1-4).

Placement in an extended position may signify that these individuals were somehow different, perhaps holding a special position within their communities. Different performative aspects of the funerary rites associated with spears may also have highlighted special roles in the community, or represented something different about the way in which these individuals lived or died.

Burial	County	Rite	Period	Objects
Rudston Burial R154	East Yorkshire	Arras Culture	MIA	1 Shield 2 Iron spearheads 1 Iron sword 1 Iron hammerhead 1 Pair iron tongs 1 Iron coupler
Rudston Burial R174*	East Yorkshire	Arras Culture	MIA	1 Shield 7 Iron spearheads 2 Bone spearheads 1 Iron sword 2 Bone toggles
Garton Station GS10*	East Yorkshire	Arras Culture	MIA	1 Shield 14 Iron spearheads 1 Iron sword
Wetwang Cart Burial 1*	East Yorkshire	Arras Culture	MIA	1 Shield 7 Iron spearheads 1 Iron sword 1 Dismantled two-wheeled vehicle with associated fittings Forequarter of a pig
Grimthorpe*	East Yorkshire	Arras Culture	MIA	1 Shield 1 Iron spearhead 16 Bone spearheads 1 Iron sword Animal bone Pottery fragments
Owslebury Warrior*	Hampshire	Extended Inhumation	LIA	1 Shield 1 Iron spearhead 1 Iron sword 1 Iron ferrule 1 Copper alloy belt hook Charred grain
Brisley Farm Burial 19	Kent	Extended Inhumation	LIA	1 Shield 1 Iron spearhead 1 Iron sword 1 Platter 1 Butt-beaker 1 Cup Half pig's head
Brisley Farm Burial 20*	Kent	Extended Inhumation	LIA	1 Shield 1 Iron spearhead 1 Iron sword 1 Butt-beaker
Kelvedon Warrior	Essex	Unknown	LIA	1 Shield 1 Iron spearhead 1 Iron Ferrule 1 Iron sword 1 Iron dagger 1 Tankard 1 Roman copper alloy bowl Iron fittings of uncertain function 2 Pedestal urns

Figure 4: Iron Age burials including shield, sword and iron spearhead (* indicates a 'speared-corpse' burial).

FIGURE 5: MAP SHOWING IRON AGE BURIALS WITH SHIELD, SWORD AND ONE OR MORE IRON SPEARHEAD/S.

The spears in the Owslebury Warrior burial and Brisley Farm burial 20 had been thrust into the wall of the grave, and their shafts broken (Collis 1973: 126; Stevenson 2013: 152-158, 2014: 40-41). R174, GS10 and Wetwang Cart Burial 1 appear to have been subjected to the 'speared-corpse' rite, discussed below.

Offensive Weapons

Few Iron Age burials include the full panoply of sword, shield and spear. A greater number of burials included one or more martial objects. These often appear in isolation, or in association with just one other class of martial object (Figure 6). Other martial objects include daggers, ferrules, sling-stones, body armour and helmets. Each class of martial object recorded from the major burial traditions observed in Iron Age Britain is discussed below.

Spears and 'Speared-corpse' Burials

The spear, noted in 36 burials, is the most frequently recorded martial object. Spearheads were most commonly found in isolation, but occasionally with shields, swords or both (Figure 6). Spearhead forms vary considerably, and include iron and bone examples. The long, angular spearhead form represented in the Brisley Farm burials and the Kelvedon Warrior burial, resemble Swanton's Anglo-Saxon Type E3, which was originally thought to be an insular development during the sixth and seventh centuries AD: this is clearly erroneous (Swanton 1974: 14).

Burials of martial character occurred most frequently within the Arras Culture of Iron Age East Yorkshire. Of particular note and unparalleled throughout Iron Age Europe is the 'speared-corpse'. This practice can be identified in 22 burials across several Arras Culture sites, and perhaps two outside East Yorkshire (Collis 1973: 126; Dent 1985: 88; Giles 2012: 1-2; Stead 1991a: 33-35; Stevenson 2014: 40). Fifteen 'speared-corpse' burials can be identified with confidence, from Grimthorpe, Wetwang, Garton Station, Kirkburn and Rudston, the remainder with varying degrees of confidence (Mortimer 1905: 237; Stead 1991a: 33-35). The rite can be described as follows: the deceased was placed into the grave and then one or more spears were thrust or thrown into the grave, sometimes piercing the corpse. The number of spears deployed in this manner varies from one (e.g. R50 and R140) to 17 at Grimthorpe (Mortimer 1905: 150). The stratigraphy suggests that the rite may have continued as the grave was being filled, with some spearheads found in the fill, the tips pointed down into the grave (Stead 1991a: 33). Many of the iron and bone spearheads appear to have suffered damage as a result of the force with which they were hurled into the grave (Stead 1991a: 75).

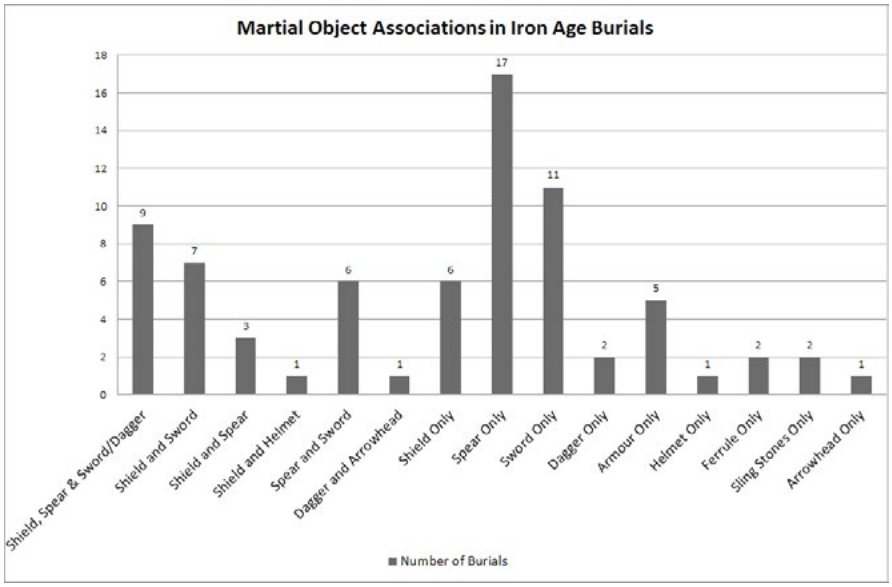

Figure 6: Associations between martial objects in Iron Age burials in Britain, burials of confident Iron Age date.

For extended or flexed burials, not subjected to the 'speared-corpse' rite, the normative position of spearheads was by the left foot with the tip pointing towards the foot of the grave (including R24, R54 and BF63). Placement of spearheads pointed to the foot of the grave was also the normative practice in the Champagne region during the La Tène I period (Stead *et al.* 2006: 75). In La Tène burials from Pottenbrun, and Mannersdorf, Austria, the placement of spears was close to the skull, by the shoulder with the tip pointed to the head of the grave (Ramsl 2011: 23-28, 2012). The final position of the spearhead at Owslebury was close to the skull, above the left shoulder, consistent with this practice (Collis 1973: 126-129). Spearhead placement, combined with other elements discussed below, suggest strong affiliations with Continental practice for this individual.

Beyond East Yorkshire, Owslebury and Brisley Farm 20 closely resemble the 'speared-corpse' ritual. Both burials show evidence that the spearheads had been either hurled or thrust into the grave and each was sited within a square enclosure, and Brisley Farm burial 20 may also have been covered with a barrow, similar to the Arras Culture rite (Collis 1968: 25-27; Stevenson 2013: 152-158, 2014: 16-17).

The reasons for the performance of such a ritual are unclear. Aldhouse Green and Giles have suggested the practice ensured the deceased would not rise from the grave (Giles 2012; Aldhouse Green 2002: 35). Individuals subjected to such aberrant acts elsewhere were often buried away from the communal cemetery and were not accorded the usual funerary rites (Müldner *et al.* 2011). However, the speared-corpse burials were not isolated and were accorded funerary rites in line with Arras Culture tradition. Further, it appears that Owslebury became a focal point for later burials, and Brisley Farm 20 is associated with acts of veneration (Collis 1973; Stevenson 2013: 179). Kristoffersen and Oestigaard (2008: 127-128) argue that variation in funerary practice may represent special rites undertaken when the deceased has "died in the wrong way or place," necessitating additional steps to ensure their safe passage.

Swords, 'Sword Burials' and daggers

Swords have been recorded from 34 burials confidently dated to the Iron Age (see supplemental file, and Figure 6 for object associations). Three burials – Rudston R87 and R153, and an Aylesford-type cremation burial from Ham Hill – included iron daggers. The swords are insular La Tène forms, assignable to Stead's Groups B-G (Stead 2006). The sword groups have distinctive geographic distributions. Groups A-D have been found in the south (apart from the outlier Group C longsword from North Grimston) and Groups E-F in the North. Group G short-swords were found in both the North and South of Britain. Northern swords never reached the lengths observed in southern examples (Figure 7), none exceeding 800mm. Swords in northern burials were medium-length swords of Stead's Groups E-F (Stead 2006: 55-70).

The only Group B example comes from the inhumation burial at Deal, dated to the late third century or first half of the second century BC (Garrow et al., 2009; Stead 2006: 166, fig.59). Medium-length Group A-B swords go out of circulation in the South in the second half of the first century BC, replaced by Group C longswords, represented in two burials (Stead 2006: 37-38). Both burials are unusual. North Grimston is the only British burial to include two swords; the second is an anthropoid-hilted short-sword with comparanda across Europe (Halkon 2013: 118). The cist burial from Bryher is the only insular burial known to include a mirror and martial objects in association (Johns 2002: 15-20). Other burials to include mirrors, such as Birdlip and Wetwang were found in close proximity to martial burials, and the association between mirrors, gender and social status remains problematic and uncertain (Joy 2011, Pope and Ralston 2011).

It is during the floruit of Group D longswords (first century BC and first century AD) that we have the greatest number of southern burials with swords (Stead 2006: 53). These eight burials include the Owslebury

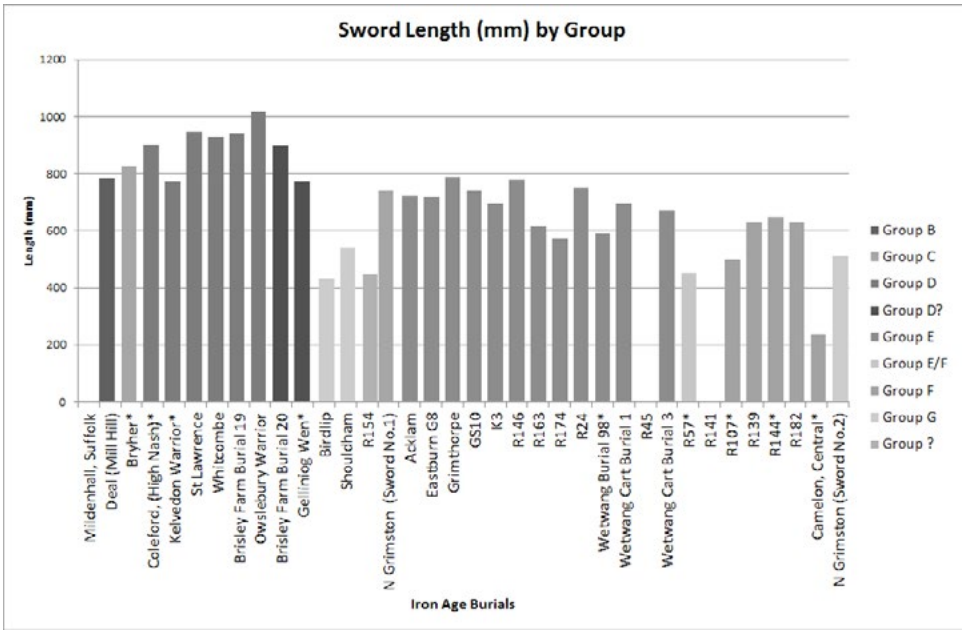

Figure 7: Overall sword length (mm) in accordance with Stead (2006). * - indicates incomplete sword

and Kelvedon Warrior, and the two Brisley Farm burials – some of the best equipped martial burials for all of Iron Age Britain (Collis 1973: 126-129; Johnson 2002; Sealy 2007: 5-8; Stead 2006: Nos.105, 115, 116, 146; Stevenson 2013: 151-179). In addition to these are the Whitcombe Warrior, a Durotrigian inhumation in Dorset, St Lawrence, Isle of Wight, and Coleford, Gloucestershire, and, possibly a cist burial at Gelliniog Wen, Anglesey (Stead 2006: Nos.114, 117, 128 & 142).

A small number burials contained short-swords of Stead's Group G: Birdlip, Gloucestershire and Shouldham, Norfolk in the south and, in the north, the anthropoid-hilted short-sword from North Grimston, and two cist burials from Camelon, Falkirk, their length suggestive of close-quarter fighting (Stead 2006: 197-198).

Swords within burials are usually found on the right side of the body, along the back, or overlying the torso. In Arras Culture burials seven of 23 burials with swords had the sword placed either along the spine, or wholly or partially over the torso. Grimthorpe, Rudston R139 and R163 have the sword placed by the left arm. In all but two instances the hilt is oriented toward the head of the grave. Kirkburn burial 3, placed behind the back, has the hilt oriented to the foot of the grave (Stead 1991a: 224-225). Brisley Farm burial 19 has the sword placed by the left leg, with the hilt pointed towards the feet (Johnson 2002: 17).

The burials with swords placed along the spine may demonstrate the way they were worn in life, matching the chalk figurines of Iron Age East Yorkshire, depicting males wearing a sword strapped vertically to their back (Stead 1988: 13). Anthoons (2011: 38-39) observed that the suspension loop on northern sword scabbards was half way along, further from the mouth of the scabbard than southern scabbards. By contrast she argues that in the south swords were worn about the waist (Stead 2006: 52, Anthoons 2011: 38). The decision to wear swords strapped along the back may explain the preference for medium-length swords in the north. Osteoarchaeological analyses from Rudston/Burton Fleming, Kirkburn and Garton Station suggest average stature for males in the region was 1.7m (Stead 1991a: 128) and swords in excess of 800mm length would not have been easily worn in this manner.

Arrowheads and Sling-stones in burials

Sling-stones and arrowheads were noted from the poorly recorded Durotrigian cemetery at Jordan Hill (Whimster 1981: 40). At Maiden Castle two burials each included two sling-stones (Whimster 1981: 269-270). Finney (2006) assessed the martial role of sling-stones in the southern hillfort dominated zone, and excavations at Danebury revealed caches of sling-stones in proximity to site entrances from Middle and Late Iron Age contexts (Cunliffe 2003: 171). At Bredon Hill, Hencken (1939: 47) noted a number of sling-stones embedded in the roadway running through the inner entrance. It is possible that this represents an expression of martial identity particular to the region.

One arrowhead was noted amongst the grave goods in an Aylesford cremation burial from Ham Hill, associated with an anthropoid-hilted dagger (Walter 1923). This is the only burial in which it is certain that the arrowhead was deliberately deposited as part of the grave good assemblage.

Non-Offensive Martial Objects

While there has been a strong research focus on martial burials furnished with offensive weapons, the importance of non-offensive martial objects must not be overlooked. Shields, armour and helmets have been recorded from 32 Iron Age burials, 12 of which did not include any offensive weapons.

Shields

Shields have been identified in 28 burials (see Figure 5 for object associations). Most examples are only identifiable from their metal fixtures, although Stead (1991a: 63-64) has noted four wholly organic shields (R154, R174, GS5 and GS10), and Hunter (2005: 52) suggests shields are underrepresented due to their poor survivability. Beyond the nine well-equipped 'warrior' burials, a further 11 Arras Culture burials included a shield. Collis (1973: 123-124) identified three shield bosses from Aylesford-type cremation burials. Other Iron Age burials with shields comprise a cremation burial from Stanway, Essex, the cist burial from Bryher, Isles of Scilly, an extended inhumation from Deal, Kent, and an inhumation from North Bersted, West Sussex (Crummy et al. 2007; Farley et al. 2014; Johns 2002).

The placement of shields within the grave was noted for 20 of the 28 burials, eleven were placed covering the torso:

- The Owslebury Warrior,
- Brisley Farm burial 20,
- Garton Station GS4, GS5, and GS10,
- Rudston R148 and R174
- Wetwang Cart Burials 1 and 3, and burial 98
- Grimthorpe

In Burial 19 at Brisley Farm the shield was placed over the legs and lower torso (Johnson 2002). These burials suggest that the normative placement for shields was partially or wholly over the body. Exceptions to this practice are observed in the Bryher cist burial, Deal and in the Aylesford-type cremation burials, where the shields were placed to one side in the grave (Johns 2002: 18). The shields in Rudston R154 and North Bersted appear to have been placed to the left of the body (Stead 1991a: 63, fig.112, 1991b; Taylor, 2014). At Stanway, the shield was placed boss-down towards the southwest corner of the grave, its concave interior serving as a cinerary vessel (Crummy et al. 2007: 170-196).

Shield forms appear to have been oval, rectangular, or hide-shaped. Stead *et al* (1968: 173) argued that British shield types differed from Continental forms, expressing a distinctly insular identity. By contrast,

the shield bosses from Owslebury and Kelvedon do not correspond with other insular examples. The bosses fit well with Brunaux and Rapin's Type V, suggestive of Continental connections (Brunaux and Rapin, 1988: 81; Collis 1973: fig.4, Sealy 2007: 11-12).

While the shield is often considered as primarily defensive its offensive potential must not be overlooked. Brunaux and Rapin (1988: 17, 21-27) interpreted the shield as providing "une défense essentiellement dynamique". Likewise, Warry (2006: 148) has argued that the *umbo* (boss) of the early Roman *scutum*, from which Celtic shield forms evolved, was employed as a weapon. *The Táin* also suggests an offensive role for the shield, Cú Chulainn described as arming himself with a shield featuring a rim that could "slice as keenly as with sword or spear" (Carson 2007: 108).

Armour and Helmets

Armour and helmets have not been found in association with offensive weapons in British Iron Age burials. The Kirkburn vehicle burial K5 includes the earliest complete find of mail armour in Britain, other fragmentary examples are recorded from cremation burials at Lexden, Essex and Baldock and St. Albans, Hertfordshire (Niblett 1999: 159-167). In addition, two helmets have been noted from a cremation burial at Canterbury and an inhumation burial from North Bersted, West Sussex. Both helmets, respectively typed as Coolus 'A' and Coolus-Mannheim examples, are datable to the first century BC (Farley *et al*. 2014). The forms were worn by Gallic and Roman warriors of the period, and the nearest comparable helmets are Gallic examples (Farley 2013: 5). These burials may represent the remains of locals who had travelled to the Continent and acquired their helmets during mercenary service, though the possibility that they were acquired locally via exotic gift exchange or trade must also be considered (Farley, 2013: 7; Richardson 2013).

Ritual Destruction and Inverted Placement of Martial Objects

Ritual Destruction

A distinct difference between British and Continental burial practices is the almost total absence of ritual destruction of weapons. However, rare instances did occur. The Kelvedon Warrior's sword and spearhead had both been deliberately manipulated prior to deposition, as had the swords from Acklam and Coleford (Sealy, 2007: 32; Stead 2006: 180-181). At Brisley Farm burial 19 the spearhead was subjected to a similar act of destruction, bent markedly out of shape. The destruction of these objects would appear to conform to Continental practice, where weapons were more frequently ritually 'killed' prior to deposition in votive or funerary contexts (Măndescu 2012; Rapin 1993).

Alternative Placement of Martial Objects: Rites of reversal

Several martial burials show unusual object placements. These burials seem to express what Parker Pearson (1999: 26) has termed "rites of reversal." Within the Arras Culture Stead (1991a) observed 15 prone, or partially prone, burials, three of which (R144, R148 and R182), included martial objects. Prone burials have not been noted at other Arras sites and prone burial may only have occurred at Rudston/ Burton Fleming and Kirkburn.

Rudston Burial R148 included an iron shield boss and fragments of the shield binding (Stead 1991a: 61). Burial R182 included an iron sword, placed behind the back, in accordance with the normative tradition (Stead 1991a: 208). Rudston burial R144 included an iron sword (in normative position) and an iron spearhead. It appears that care was taken to ensure the placement of the spearhead by the left foot, with the tip pointed toward the body, suggesting, along with the prone position, an inversion of the natural order.

At Brisley Farm, burial 19 shows a distinct expression of altered placement of the grave goods. Each of the martial objects deviates from the normative placement. The sword is placed by the left foot, and the orientation is inverted so that the hilt is at the foot of the grave. The spearhead is placed over the right shoulder in the position the sword would usually have been placed. The shield boss was placed over the knees rather than covering the torso. The position of the body, oriented to the south, is also slightly unusual.

In Kirkburn burial 3, the Kirkburn sword was placed with the finely decorated scabbard face-downward into the grave and the hilt oriented towards the foot of the grave. This facedown sword placement was also observed in the Owslebury Warrior burial. By contrast, sword placement in other burials prominently displayed the decorated scabbard faces.

In the Kirkburn vehicle burial, the mail shirt was placed in the grave with its sleeves close to hips and its opening close to the shoulders as if ready to put on (Stead 1991a: 54-55). The placement of the shirt in this manner is highly unusual, though there are ethnographic parallels for turning clothing inside out in funerary rituals (Goody 1962: 72-73, Okely 1983: 217-218).

The copper alloy helmet found at Bridge, near Canterbury may also echo this inverted placement of martial objects. The position may have been dictated by its function as a cremation vessel (Farley et al., 2014). However, the use of a face-down shield as a cinerary vessel at Stanway suggests the practice may have held greater significance (Crummy *et al.* 2007: 171). Wetwang Cart Burials 1 and 3 also included shields, placed boss-downwards into the grave (Dent 1985).

Conclusions

Martial burials are far greater in number and diversity than has previously been acknowledged for the Iron Age in Britain. The more inclusive assessment presented in this article, examining all classes of martial objects included in burials, allows for patterns to emerge. A range of martial associations formed an important part of the constructed funerary identity of select individuals within the Iron Age communities of Britain. Strong contacts with the Continent are indicated through the inclusion Continental shield forms observed at Kelvedon and Owslebury, and the helmets recovered from Canterbury and North Bersted, highlighting the exchange of ideas and equipment. The performance of acts of ritual destruction in a small number of martial burials, suggests Continental influences in the funerary rites accorded some individuals.

Performative aspects of burials including spearheads indicate that funerals could be dramatic spectacles, which sometimes, as at Brisley Farm and Owslebury, became foci for ongoing acts of veneration, such as feasting and later burial activity. The enactment of rights of reversal also appears to have been a much more prevalent part of martial burial rites than previously recognised. It is hoped that future research will continue to expand our understanding of martial burial practices during the British Iron Age.

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Supplemental file: Full list of Burials

County	Site	Grave	Reference	Confident IA Burial?	Date	Burial Rite	Shield
Angelsey	Gelliniog Wen	Gelliniog Wen	(Piggot, 1950, Whimster, 1981: 353, Stead, 2(	Yes	First C BC - First C AD	Extended Inhumation	
Birkshire	Wooley Down	Barrow 2, Chaddleworth	(Whimster, 1981: 391)	No	Romano-British	Secondary Cremation burial in ring barrow	
Cambridgeshire	Snailwell	Snailwell	(Lethbridge, 1953)	Yes	First C AD (pre-conques	Aylesford Cremation	1
Cambridgeshire	Soham	Soham	(Fox, 1923; Whimster, 1981: 229)	Possible	Poss Anglo-Saxon	inhumation	
Cambridgeshire	Wittlesford	Wittleford Burial Mound	(Fox, 1923 77-79)	Possible	?	Barrow burial	
Canterbury	Canterbury	Canterbury, Helmet Cremation Burial	(Farley et al., Forthcoming)	Yes	75-25BC	Cremation burial	
Clackmannanshire	Alloa	Marshill, Alloa	(Stead, 2006: No. A283)	Possible	90-130AD	cist burial	
Cumbria	Haverbrack	Haverbrack, The Dog Hole	(Whimster, 1981: 408)	No	?	Cave Deposit	
Derbyshire	Winster	Winster	(Whimster, 1981: 403)	Yes	First C BC	Double inhumation	
Dorset	Maiden Castle	'Peace-time' burial No.18	(Wheeler, 1943; Whimster, 1981: 262)	Yes	Belgo-Roman	Rampart Burial	
Dorset	Maiden Castle	'War Cemetery' No.48	(Wheeler, 1943; Whimster, 1981: 262)	Yes	Belgo-Roman	Durotrigian Inhumation	
Dorset	Maiden Castle	'Peace-time' burial No.7	(Wheeler, 1943; Whimster, 1981: 262)	Yes	Belgo-Roman	Durotrigian Inhumation	
Dorset	Portland, The Grove	Portland, The Grove	(Whimster, 1981: 258)	No	Romano-British	Durotrigian Inhumation	
Dorset	Quatre Bras	Bradford Peverell	(Piggot, 1950)	Possible	?	?	
Dorset	Whitcombe	Whitcombe, Skeleton 12	(Aitken and Aitken, 1991)	Yes	Romano-British	Durotrigian Inhumation	
Durham	Bishop Middleman	Bishop Middleman	(Whimster, 1981: 408)	No	?	Cave Deposit	
East Yorkshire	Arras	Arras Burial W15	(Whimster, 1981: 293)	No	MIA	Arras	
East Yorkshire	Bugthorpe	Bugthorpe	(Stead, 1979: 58-61)	Possible	MIA	Arras	1
East Yorkshire	Burton Fleming	BF63	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Clotherholme	Clotherholme	(Collis, 1973)	Possible	MIA	Arras	
East Yorkshire	Eastburn	Eastburn G7	(Sheppard, 1939)	Yes	MIA	Arras	
East Yorkshire	Eastburn	Eastburn G8	(Sheppard, 1939)	Yes	MIA	Arras	
East Yorkshire	Eastburn	Eastburn G11	(Sheppard, 1939)	Yes	MIA	Arras	1
East Yorkshire	Eastburn	Eastburn G12	(Sheppard, 1939)	Yes	MIA	Arras	1
East Yorkshire	Garton Station	GS10	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Garton Station	GS7	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Garton Station	GS5	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Garton Station	GS4	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Garton Station	Garton Station 'Anglo-Saxon' Burial	(Mortimer, 1905: 237)	Possible	MIA	Arras	
East Yorkshire	Grimthorpe	Grimthorpe	(Stead et al., 1968)	Yes	MIA	Arras	1
East Yorkshire	Hunmanby	Hunmanby Chariot Burial	(Sheppard, 1907)	Yes	MIA	Arras	1
East Yorkshire	Kirkburn	K3	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Kirkburn	Kirkburn Grave 7 (1939)	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Kirkburn	K5	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Kirkburn	Kirkburn Grave 8 (1939)	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Kirkburn	Kirkburn Grave 11 (1939)	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Kirkburn	Kirkburn Grave 12 (1939)	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	North Grimston	Birdsall	(Mortimer, 1905: 150-152)	Yes	MIA	Arras	
East Yorkshire	Rudston	R174	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Rudston	R154	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Rudston	R146	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R24	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R50	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R57	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R94	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R140	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R144	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R152	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R170	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R45	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R87	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R107	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R139	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R141	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R148	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Rudston	R153	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	R163	(Stead, 1991)	Yes	MIA	Arras	1
East Yorkshire	Rudston	R182	(Stead, 1991)	Yes	MIA	Arras	
East Yorkshire	Rudston	Rudston Thorpe	(Greenwell, 1906)	Possible	MIA	Arras	
East Yorkshire	Rudston	Thorpe Hall	(Greenwell, 1906)	Possible	MIA	Arras	
East Yorkshire	South Cave	South Cave	(Stead, 2006: No.195)	Possible	?	?	
East Yorkshire	Wetwang	Wetwang Cart Burial 1	(Dent, 1985)	Yes	MIA	Arras	1
East Yorkshire	Wetwang	Wetwang Burial 211	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Burial 346	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Burial 269	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Burial 101	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Burial 360	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Burial 98	(Dent, 1984)	Yes	La Tène II to La Tène III	Arras	1
East Yorkshire	Wetwang	Wetwang Burial 244	(Dent, 1984)	Yes	MIA	Arras	
East Yorkshire	Wetwang	Wetwang Cart Burial 3	(Dent, 1985)	Yes	MIA	Arras	1
Essex	Colchester	Playgolf Colchester	(Shimmin, 2014)	Yes	First C AD	Cremation burial	
Essex	Kelvedon	Kelvedon Warrior	(Sealy, 2007)	Yes	First C BC	?	1
Essex	Lexden	Lexden	(Foster, 1986)	Yes	Late First C BC	Cremation burial	
Essex	Stanway	Stanway	(Crummy et al., 2007)	Yes	Mid 1st C AD	Cremation burial	1
Falkirk	Camelon	Camelon, Central (1922)	(Breeze et al., 1976)	Yes	LIA	cist burial	1
Falkirk	Camelon	Camelon, Central (1975)	(Breeze et al., 1976)	Possible	Romano-British	cist burial, double inhumation	1
Fife	Mersford	Merlsford, Fife	(Hunter, 2005)	Possible	Romano-British	?	
Gloucestershire	Birdlip	Birdlip, Gloucestershire	(Stead, 2006: No.231)	Yes	Mid 1st C AD	Cairn burial	
Gloucestershire	Coleford	Coleford, (High Nash)	(Stead, 2006: No.128)	Yes	Second C BC - First C AI	?	1
Hampshire	Owlesbury	Owlesbury Skeleton 39	(Collis, 1973)	Yes	Late La Tène	Extended Inhumation	1
Hertfordshire	Baldock	Baldock	(Niblett, 1999)	Yes	20-35AD	Aylesford Cremation	
Hertfordshire	Folly Lane	Folly Lane	(Niblett, 1999)	Yes	Mid 1st C AD	Cremation burial	
Hertfordshire	Little Amwell	Little Amwell, Hertford Heath	(Whimster, 1981: 375)	Possible	LIA	Aylesford Cremation	1
Hertfordshire	St Albans	St Albans	(Niblett, 1999)	Yes	Mid 1st C AD	Cremation burial	
Hertfordshire	Welwyn Garden City	Welwyn Garden City	(Collis, 1973)	Possible	First C AD (post-conque	Aylesford Cremation	1
Isle of Wight	St Lawrence	St Lawrence	(Collis, 1973)	Yes	Second C BC - First C AI	?	1
Isles of Scilly	Bryher	Bryher, Isles of Scilly	(Johns, 2002)	Yes	410-350 cal BC	Cist burial	1
Kent	Brisley Farm	Brisley Farm Burial 19, Ashford Kent	(Johnson, 2002)	Yes	30-50ad	Extended Inhumation	1
Kent	Brisley Farm	Brisley Farm Burial 20, Ashford Kent	(Johnson, 2002)	Yes	10-30AD	Extended Inhumation	1
Kent	Deal (Mill Hill)	Grave 112	(Parfitt, 1995)	Yes	Late 3rd to first half 2n	Extended Inhumation	1
Kent	Dumpton Gap	Dumpton Gap		Yes	La Tène III	inhumation	
Lancashire	Billington	Billington		Possible	?	Cist Burial, under a barrow	
Mid-Glamorgan	St Brides Major	St Brides Major, Ogmore Down	(Whimster, 1981: 418)	No	Poss Anglo-Saxon	inhumation	
Mid-Glamorgan	St Brides Major	St Brides Major, Ogmore Down	(Whimster, 1981: 418)	No	Poss Anglo-Saxon	inhumation	
Midlothian	Kirknewton	Kirknewton, East Langton	(Whimster, 1981: 414)	Possible	?	?	
Norfolk	Shouldham	Shouldham	(Collis, 1973)	Yes	?	Extended Inhumation	
North Yorkshire	Acklam	Acklam	(Stead, 2006: No.189)	Yes	Second C BC	?	
North Yorkshire	Airton	Airton	(Whimster, 1981, 405)	Yes	MIA	Barrow burial	
North Yorkshire	Birdsall	Aldro Group burial 108	(Mortimer, 1905: 56)	Yes	EIA	Cremation burial	
North Yorkshire	Malham	Malham, North Yorkshire	(Whimster, 1981: 406)	Possible	?	Cairn burial	
North Yorkshire	Malham	Malham, North Yorkshire	(Whimster, 1981: 406)	Possible	?	Cairn burial	
Northamptonshire	Stanfordbury	Stanfordbury	(Hunter, 2005)	Yes	First C AD (post-conque	Aylesford Cremation	1
Oxfordshire	Sutton Courtenay	Sutton Courtenay	(Hunter, 2005)	Possible	?	Cist Burial	1
Somerset	Wookey Hole	St Cuthbert Out	(Whimster, 1981: 399)	Possible	?	Cave Deposit	
South Somerset	Ham Hill	Ham Hill	(Walter, 1923)	Yes	First C AD	Aylesford Cremation	
Stirling	Goshen	Goshen	(Hunter, 2005)	Possible	Romano-British	Cist Burial	
Suffolk	Mildenhall	Mildenhall	(Hunter, 2005)	Yes	La Tène II	Extended Inhumation	
Suffolk	Risby	Risby, Barrow Bottom	(Fox, 1923 76-77)	Possible	?	Barrow burial	
West Sussex	Bersted	North Bersted	(Taylor, 2014)	Yes	50BC	inhumation	1
Dorset	Jordan Hill	Weymouth - Multiple Graves	(Whimster, 1981: 260)	No	Third to Fourth C AD	Durotrigian Inhumation	

Iron Spear	Bone Spear	Ferrule	Sword	Dagger	Knife	Arrowhead	Sling Stones	Armour	Helmet	Other
			1							
				2						
1										2 dogs
1										iron nails
									1	
1			1							suspension rings and oranments
										iron axe
2										rotary quern
							1			
							2			
							2			
1										
			1							
1			1							hammerhead
	1									
										1 Miniature Axe
			1							
1					1					
			1							
1										
			1							
14			1							
11										
4	3									
3										
7										
1	16		1							
3			1							
1										
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			2							
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			1							
5										
1			1	1						
								1		
1										
			1							
2			1							
1										brooch of Roman type
			1							
			1							
1		1	1							
								1		vessel and pig
								1		Horse fittings, Cattle, sheep, pig and hare, Furniture, shoes poss bird figurine
								1		
			1							
			1							mirror
1			1							
1			1							
			1							
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1										
				1					1	
				1					1	
				1						
			1							
			1							
1										
		1								
1										
1										
1			1							
				1	1					1 iron billhook
				1		1				
1										ornament
			1							Ornament, 2 horses Tool
2										
									1	3 iron rods, ceramics
	1	1	1			2	2			

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Iron Age Iron Production in Britain and the Near Continent

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The nature of social and technological reciprocity has been of interest to anthropologists for decades, and generated a great deal of theoretical debate within various academic disciplines (Dobres and Hoffman 1994; Pfaffenberger 1992; Schiffer and Skibo 1987). This fundamental connection between object and individual also lies at the heart of material-based archaeological analyses, as the evolution, adaptation and transmission of particular technological practices (in theory) represent discrete and identifiable episodes in human history. However, establishing firm links between objects and the people who made them is a complicated endeavour in modern contexts, and is even more daunting when applied to extinct social groups. To help in this matter, many archaeologists have advocated an approach focused on technological processes, exemplified in the *chaîne opératoire*, as opposed to simply looking at finished products (Figure 1; Martinon Torres 2002; Sellet 1993). One of the benefits of this theoretical framework is that due to the increase in the number of recognized relevant technological stages, researchers can begin to more seriously take advantage of "hard" scientific resources, allowing for a more dynamic marriage between social and material science.

Figure 1: Simplified iron production chaîne opératoire.

Archaeometallurgical studies, in particular, have profited from this sort of holistic approach. For example, when dealing with iron, each stage in the manufacturing process (from ore beneficiation to bloom refining to final deposition) offers an opportunity to employ an array of microscopic, spectroscopic and experimental techniques. By combining several different approaches to various stages in the *chaîne opératoire*, the task of understanding the overall production complex becomes much more manageable.

Slag, the waste material from smelting and smithing operations, has been increasingly recognized as an especially valuable resource as it was often left by ancient craftspeople *in situ* following the completion of metallurgical operations (Paynter 2006: 272). Its ubiquity on archaeological sites, as well as its perceived low social value compared to other metallic artifacts such as ornate finished objects make slag a prime target for scientific analyses.

The research introduced in this paper is part of a systematic compositional survey of ferrous production remains in Scotland, with the aim to compile new scientific data for comparison with existing studies in England and France. As no current models for such research exist in northern Britain, a basic framework has been created to try and maximize interpretive results from the relatively small body of available Iron Age slag assemblages. Several previous investigations of ferrous archaeometallurgical data from other geographic areas have been the basis for the methodology used here, permitting a pilot evaluation within the confines of Scotland.

Methodology

Two distinct forms of analysis take place in compositional studies of metallurgical residues; an initial technical characterization of the material, and a subsequent estimation of how this characterization relates to the contextual setting of the assemblage within its archaeological environs. Specific to ferrous metallurgy, these analyses allows archaeologists to identify the temperatures reached in furnaces, the relative "efficiency" of a smelt, the scale of production, what type of ores were used, and potentially even discrimination markers between smelting and smithing remains. This in turn leads to the possibility of asking more intimate questions of the material: if different slag morphologies are present on a given site, are there observable compositional differences between these classifications? What can these chemical discrepancies be attributed to? How does the character of metalliferous waste reflect or refute existing interpretations of iron production and social organization? To begin to answer these questions, a coherent procedure needs to be established specifically targeting certain elements of a compositional profile.

Technical Characterization

As a function of the relatively limited input materials introduced during the iron production process, the predominant oxides expected in Iron Age European slags are FeO, SiO_2, CaO, and potentially Al_2O_3 (Bachmann 1982: 10; Pleiner 2000: 252). Proportional variation of major constituents can indicate a great deal about the overall procedure, though the quantities of other minor-element level oxides such as MgO, K_2O, P_2O_5 and MnO are of equal value in reconstructing past activities. These can be measured both qualitatively and quantitatively using different analytical techniques, depending on the types of questions being asked of the material. The presence of certain elements (such as titanium or manganese) can offer clues about the ores used during the smelt, and can also help to test initial macroscopic classifications, potentially separating smelting and smithing slags (McDonnell 1986: 203). Corroboration between reflected light microscopy and spectroscopy, especially in the case of mineralogical phases such as wüstite (FeO) and fayalite (Fe_2SiO_4), enables general assessments of redox conditions and yield efficiency. Bloom-welding lines or flow interaction zones may also present themselves when looking at slag under the microscope, linking material to specific stages within the smelting or smithing procedure. Although these kinds of basic characterization points represent a critical first step in slag analysis, they alone are not sophisticated enough to account for potential diachronic and geographic variability in sample material, necessitating the exploration of more nuanced methods for this study.

Non-Reduced Compounds

The process of scientifically analyzing stages within the *chaîne opératoire* has led some archaeologists to apply the same framework on the micro-scale to individual properties observed within smelting "systems". A system, as defined by Dillmann and L'Heritier (2007: 1814), is a "smelting operation with the same ore, charcoal, fluxes and furnace lining". As each one of these components has a particular chemical composition (and elements preferentially partition during the smelt into either the iron bloom or slag), it is postulated that certain NRC (non-reduced compound) ratios represent signatures within these systems. This enables unique system profiles to be generated for different slag corpora and allows them to be differentiated through compositional slag analysis. As each smelting system exhibits variable chemical ratios due to furnace construction and smelting parameters, slags showing similar NRC ratios likely represent similar overall smelting conditions. Since the NRC signature is created within the first smelting operation (or is altered during smithing), primary production system markers can be identified using NRC analysis, and are just as useful as the slag inclusion indicators the technique was originally devised for. With this approach in place, the reasons behind similarities (or differences) in the observed chemical profiles can then be considered in wider socio-technological terms.

Slag "Optima"

While NRC ratios can highlight connections between slag groups, they offer comparatively little help in identifying and interpreting choices made by prehistoric craftspeople. Rehren *et al.* (2007) propose a model that elucidates some of these cognitive elements, identifying two eutectics (the lowest temperature of solidification for a given mixture) within ternary space as reference points. These so called slag "optima" represent different theoretical production scenarios; Optimum 1 requires higher fuel usage and smelting temperatures (resulting in a more "efficient" iron extraction from the ore), and Optimum 2 uses less fuel and lower temperatures, but sacrifices significant quantities of "wasted" iron in the process. Slag approaching the first optimum also carries with it a greater risk of accidental carburization (rendering the bloom unusable in prehistory), while the second is far more forgiving in practical terms. It is proposed that the position of slag plotted between these two poles within a ternary diagram can offer clues about the priorities and decisions made by prehistoric smelters.

The merits of this approach are disputed elsewhere (see Young and Poyner 2014), as without specific knowledge of ore and furnace lining composition, materials-balance reconstructions of smelting systems are not necessarily indicative of overall extractive efficiency. Even with a rough understanding of the system output, the formation of slag approaching Optimum 2 (roughly 75 wt% FeO, 20 wt% SiO_2, and 5 wt% Al_2O_3) without the use of an extremely ferruginous ore source would require very inefficient reducing conditions within the furnace. Thus, depending on the nature of parent materials and the smelt conditions, these optima will not always represent a viable "target" that artisans would have striven towards.

However, if these eutectics are considered as general directions of production, rather than specific goals pursued by ancient craftspeople, certain elements of choice may yet be visible when combined with contextual excavation information. As Rehren *et al.* (2007, 215) state, "... it is still necessary to understand the relevant phase diagrams and the behavior of the melt as it evolves from ore to slag and metal, not least to identify those driving factors and constraints which have to be taken into account when isolating the variables available for human choice". By recognizing that ore composition may restrict certain production scenarios, and understanding the general character of furnace construction and use, the position of slag in a ternary system can still highlight unexpected data trends and serve as a useful comparative tool between assemblages and sites. Slag plotting between the two optima is to be expected, though this makes inferring past priorities and decisions more difficult.

Although necessarily abbreviated, the above points permit a pilot evaluation program to be set up to apply to individual sites and assemblages as well as larger geographic regions and site clusters, on the basis of subsequent stages of technical characterization, NRC analysis, and ternary plotting. This model can 1) offer a general appraisal on the character of a slag corpus, 2) attempt to identify whether or not the slag in question is from a single smelting system, 3) and begin to make provisional statements about the priorities and technological practices of ancient craftspeople. To demonstrate the model's utilities and shortcomings, these methods will be applied in the following case study of a Scottish Iron Age slag assemblage.

Grantown Road, Forres

The small scale domestic site of R2 Grantown Road in Forres, Scotland (NJ 0263 5740), was excavated in 2008, comprising a single ring-ditch roundhouse, *souterrain*, and two potential furnaces (Cook 2008: 10). Occupation layers are dated to the later Iron Age (on the order of approximately 150 BC – 150 AD, based on the presence of diagnostic structural features such as the *souterrain),* although radiocarbon dating is not published for the site. Excavations yielded approximately 34 kg of iron slag, and a total of 27 samples of slag and associated silicates were taken using both scanning electron microscopy (SEM-EDS) and

Sample	Type	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO
152/109 #6	Tap	0.9	N.D.	6.8	28.2	0.6	2.3	1.9	N.D.	3.8	55.4
152/109 #8	Tap	1.2	N.D.	8.2	29.1	1.3	2	1.8	N.D.	1.8	54.6
158/111 #6	Tap	0.6	N.D.	6.2	45.7	1.1	3.1	1.2	N.D.	1.2	41
158/120 #2	Tap	0.2	N.D.	8.1	19.5	2.3	0.9	0.7	N.D.	1.3	67
214/124	Tap	1	N.D.	6.6	26.7	0.4	1.3	1.9	N.D.	3	59.2
152/109 #5	Furnace	1.4	N.D.	4.7	25.5	4.6	1.2	2.9	N.D.	N.D.	59.6
152/111 #1	Furnace	0.7	N.D.	8.3	18.3	2.4	0.9	0.8	N.D.	1.2	67.3
199/114	Furnace	1.2	N.D.	8	25.4	0.3	1.5	1.4	0.1	0.8	61.3
206/006	Furnace	0.2	N.D.	4.2	25.8	1	0.6	1.1	N.D.	10.2	56.9
220/125	Furnace	1	0.2	3.1	26.1	0.6	2	3.5	0.3	4.2	59
220/126	Furnace	0.9	N.D.	6.7	25.8	0.2	1.5	0.9	N.D.	1.7	62.4
152/109 #1	Contact	0.8	N.D.	7.6	31	0.8	2.2	1.4	N.D.	4.1	52.2
152/109 #2	Contact	0.8	N.D.	8.2	38.6	0.6	2.4	1.9	N.D.	2.9	44.4
152/109 #9	Contact	0.5	N.D.	9.4	25.1	0.5	1.6	1.1	0.3	5.9	55.8
159/122 #2	Contact	0.5	N.D.	6	28.9	0.6	1.7	1.1	0.2	3.1	58

Figure 2: Normalized SEM-EDS compositional values of the Grantown Road slag (weight %).

X-ray fluorescence (XRF) at the Wolfson Laboratories at UCL in order to generate a site profile of the metallurgical system in use at Grantown Road (Stetkiewicz 2011). The SEM-EDS values are presented in Figure 2 and are plotted in ternary space against Rehren *et al's* slag optima model in Figure 3.

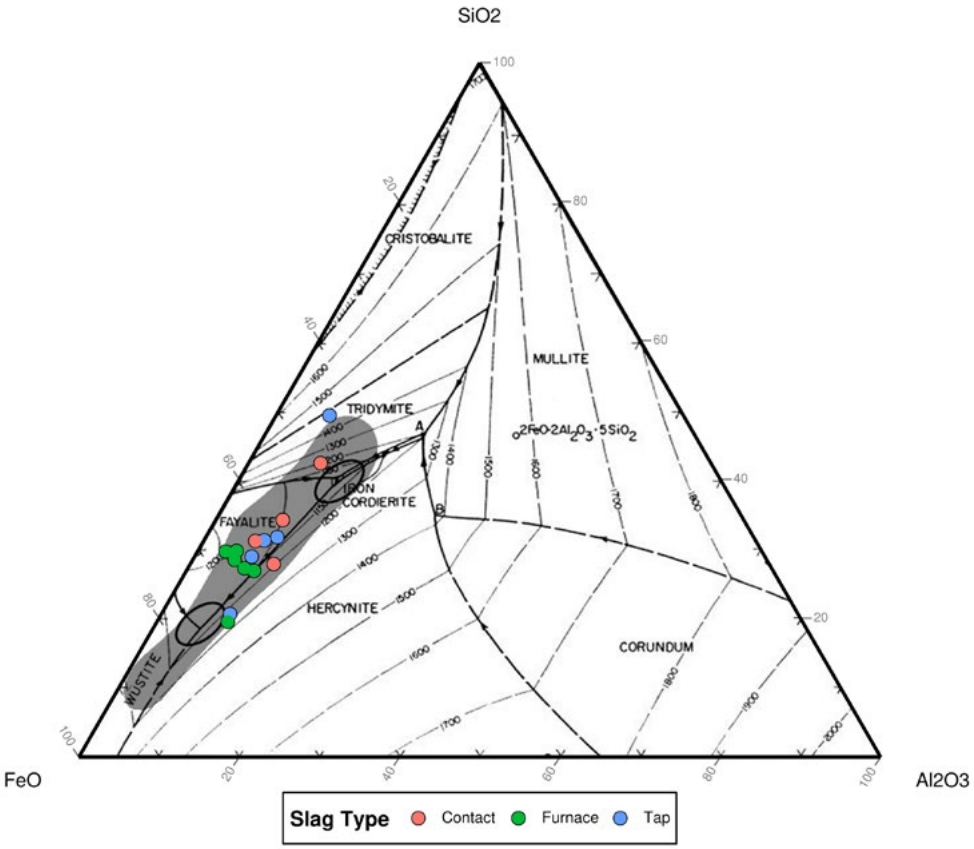

Figure 3: Grantown Road slag plotted in ternary space.

Figure 4: Furnace slag.

Figure 5: "Tap" slag.

Figure 6: Contact slag.

Several different slag morphologies were present within the assemblage (see Figures 4-6), and these were grouped according to density, porosity, and overall form (per McDonnell 1986, 195). Instances of small, fully liquefied, horizontally flowed slag were tentatively categorized as tap slag in 2011, though other specialists have since considered these to be in fact "runned" slag (G. Cruickshanks, personal communication, 2015) or slag "prills". While the presence of tap slag in a Scottish Iron Age context is rare, instances have been found and dated to between the 7th and 5th centuries BC at Broxmouth (McDonnell, in Armit and McKenzie 2013, 394). No hammerscale was reported during excavation, and only a single, unstratified piece displayed characteristic smithing slag attributes. Thus, the assemblage appears to represent the remains of a small-scale primary production operation.

Technical Characterization

The levels of FeO and SiO_2 found in the Grantown Road slag are relatively unsurprising and offer little in the way of interpretive value outside of the fact that they seem to indicate a process unconcerned with maximum iron extraction from the ore, as FeO values over 50% are considered to be high (Pleiner 2000: 252). Judging from elevated levels of P_2O_5, MnO and Ba, it would seem that bog iron is the most likely ore to have been used at Grantown Road, with ferric oxyhydroxides such as limonite representing a major ore source in Scotland (Hall and Photos-Jones 1998: 57). CaO, which enters the smelting system through ore or fuel ash, is surprisingly low in the tested samples. The elevated alkali levels are difficult to account for, but may originate from saline-saturated trees from near the coast, implying a very local focus for charcoal production (Findhorn Bay on the Moray Firth lies less than two miles north of Forres).

Non-Reduced Compounds

Figure 7 presents the composition of the Grantown Road slags in NRC scatter plots, as measured by weight percent. As MgO values in the tested samples were below detection limits in all but one case, that oxide has omitted from analysis. Three slag classes were initially identified by macroscopic evaluation, and if the groups were indeed from appreciably different smelting systems, one would expect to find NRC concentrations relating to these perceived slag types. However, very little in the way of clustering can be seen along the assumed classificatory lines. ANOVA similarly found no statistically significant differences between the morphological groups (at $p<0.05$), suggesting that either the macroscopic groups are a product of a largely homogeneous tradition, or NRC association lies in much more complex slag groupings than were tested for.

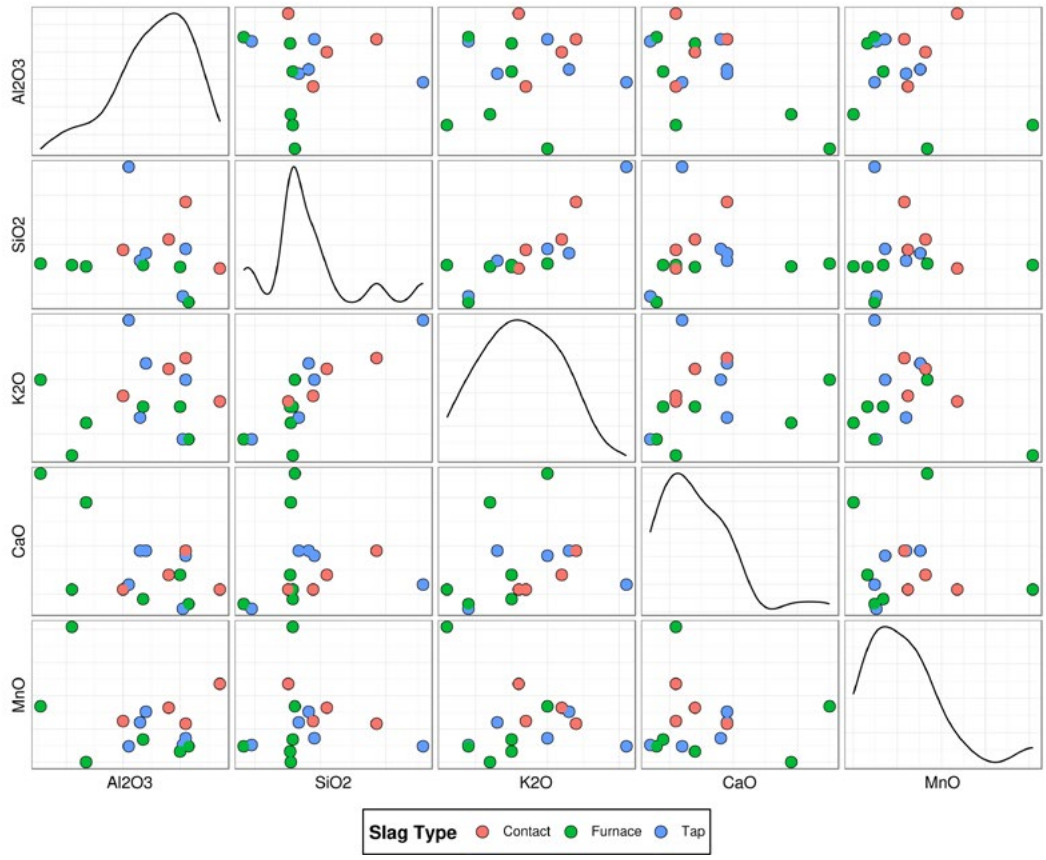

Figure 7: NRC bivariate scatter plots of the Grantown Road assemblage.

Slag Optima

The slag assemblage from Grantown Road falls roughly between the two optima identified by Rehren et al, suggesting that the system was not likely constrained heavily by either a scarcity of iron minerals or fuel. The compositional nexus is even more pronounced when contextual issues during excavation are noted with some of the outliers that plot towards or past the two optima (Stetkiewicz 2011: 33). Variation within the core cluster is most likely attributed to two primary factors; the degree of system reduction (the amount of fuel used, draught, and the duration of the smelt), and the ore charge (Rehren *et al.* 2007: 214), rather than any radically alternate source of parent materials.

Interpretation

With these observations in place, several conclusions can be drawn. Firstly, the overall nature of the Grantown Road slag can be outlined. The material indicates a comparatively economically unsophisticated operation took place on site, and the smelters probably utilized local sources of bog iron ore and charcoal. Secondly, the analytical work points to a slag corpus resulting from a relatively homogeneous smelting system, likely either a single episode or series of activities carried out with similar materials, expertise, and redox conditions. It does not seem to have been a prolonged operation, as larger quantities of slag and more furnace features would be expected. Thirdly, the position of the assemblage in ternary space implies that the smelters were operating without a need to conserve fuel, but were similarly uninterested in highly efficient iron extraction from their ore.

While these statements are useful in their own right, their true value comes from integrating the points in context with the rest of the site and in the wider Scottish Iron Age. The typical view of a later first millennium BC homestead in Scotland is one of relative self-sufficiency and transience, with recent thought on the occupation of roundhouses advocating a generational view of the structures, rather than one of great longevity (Hunter and Carruthers 2012: 53). If the furnace(s) at Grantown Road were used to produce iron for local consumption (as indicated by the general scale of operations), the single-episode/single-generation implication of the compositional data fits quite well with this broader interpretive model. The assumed priorities of prehistoric craftspeople at Grantown Road (to produce iron in the easiest fashion, without specific concern for efficiency or resource conservation) would not be unexpected in this area at the time, as local bog iron ore is considered to have been plentiful throughout most of Iron Age Scotland. If timber sources for charcoal production were locally produced, as the presence of alkali metals may indicate, the entire smelting operation in question could have been carried out without the participants having to travel more than a few miles.

The aforementioned observations offer some interesting points of discussion, but certain inadequacies with the proposed model must also be noted. The scientific complexities of chemical reduction within furnaces are still largely based on conjecture, at the mercy of a limited experimental database (Blakelock *et al.* 2009: 1746). Thus, the assumed behaviour of NRCs to represent system signatures may not be completely reliable. Charlton (2006: 116-125) has also outlined the underappreciated complexities of identifying and explaining "groups" and "classes" in slag analysis, and advocates the use of multivariate statistics to mitigate against these issues (an approach currently being pursued for integration with this study). Moreover, despite a chronological separation of several centuries, some slags display profound compositional similarities, necessitating a strong absolute dating program to be used in conjunction with metallurgical studies (Dungworth 2011: 11), something unfortunately not possible with the Grantown Road slag. As discussed in the methodological section, the slag optima model put forward by Rehren et al is not universally accepted, and takes a controversial leap by extrapolating anthropogenic elements from purely scientific data. Perhaps most importantly, this proposed framework addresses, at best, three stages in the iron production *chaîne opératoire* (smelting, bloomworking, and secondary smithing), rendering it far from a comprehensive approach.

Despite these issues, this interpretive model provides a much needed first step in archaeometallurgical studies in Scotland. Employing it, a small reference point is created that incorporates a smelting system record, a ternary interpretation, and the context of the surrounding area. That reference point can then be used to compare the Grantown Road slag with other Iron Age assemblages across Scotland (see Figure 8). Slag assemblages from Buchlyvie, Moncreiffe, Applecross, Ellary Boulder Cave, and Kintore are currently being analyzed to use in association with the handful of existing compositional surveys carried out at Culduthel, Seafield West, High Pasture Cave, and Broxmouth. With a larger data set available, it is hoped that regional and even national scale trends within slag compositions can be observed.

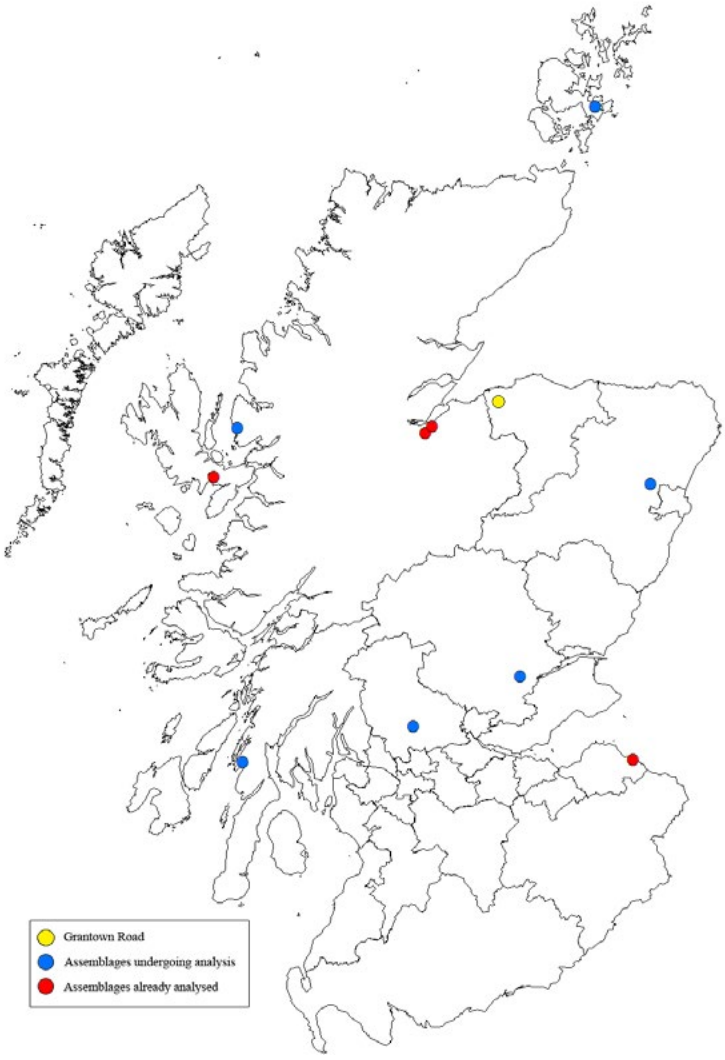

Figure 8: Scottish Iron Age iron assemblages.

To better understand how the development of iron production techniques in Scotland is paralleled elsewhere in the European Iron Age, slag studies carried out in England and France need to be incorporated as well. Paynter's (2006) study of English slags presents an excellent basis for such juxtapositions, and is supplemented by other studies carried out in East Yorkshire (Dungworth 2009), Gloucestershire (Fulford and Allen 1992) and Berkshire (Preston 2013). Comparisons of iron and its use across the English Channel are not new, as the traditional view of iron's spread to the UK is one of diffusion from the continent (Tylecote 1986: 124); a cultural connection illustrated clearly in the exploration of iron in burials from the "Arras" culture (Halkon 2007). While problems present themselves regarding the compatibility of studies from across such large geographic and cultural spaces, the simplicity of the approach advocated here has the potential to balance some of these complexities and establish a common interpretive language.

Conclusion

Although numerous techniques exist to analyze archaeological materials, studying the *chaîne opératoire* widens the scope of both subjects and approaches available for examination. The methods employed in this paper, building off that premise, allow for several production stages to be explored together, with an aim to relate observed compositional trends to human decisions where possible. For Iron Age Scotland,

this represents one of the first such attempts to bridge social and technological factors through "base" (e.g. slag) material analysis, exploiting the reductional potential of the pilot model used here to facilitate inter- and intra- site comparability. This encourages a shift away from studying perceived historical elite, who have long attracted archaeological capital, and instead focuses attention upon much more obscure social elements in both British and wider European contexts. Given the staggering preponderance of everyday iron objects in areas such as France during the later La Tène period, slag studies represent a valuable opportunity for archaeologists to approach prehistoric mentalities removed from (or, perhaps, less strictly dictated by) a highly specialized, elite-driven production system. Accordingly, the priorities, decisions and innovations recognized in the metallurgical record likely represent important changes that affected a large segment of the general population, and thus provide a unique window into the lower social strata of the past. With a scientifically grounded picture of Iron Age iron manufacturing in place, this can then be compared with existing social science models to integrate these lines of thought into a more systematic and robust understanding of prehistoric iron production.

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Religion and society
Cave sanctuaries and votive offerings in Oretania

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Introduction

This paper attempts to approach the role that religion exercised over the group formation process of the Oretani, one of the most prominent Iberian ethnic groups. The study focuses on their famous places of cult, the cave sanctuaries, although the sacred caves were not the only places of worship for the Iberian world.[1] The importance of these places is based on the finding of votive offerings that represent human figures, animals and anatomical parts.[2] I therefore consider the term 'sanctuary' not only as an area with a sacred function, but also with an economic, social, commercial and political-territorial background.

This article is divided into two main premises. First, the rituals documented in the cave sanctuaries have been brought together. Secondly, the *ex-voti* in bronze, a distinct feature of Oretani culture, have been analysed, focusing on their possible role in the Iberian liturgy.

Oretania and the Oretani

The Oretani are mentioned by the classical sources as *Oretani* or *Orissios* (Tovar 1989: 28) (lit. "mountain dwellers"). The origin of Oretani culture is established from the end of the Bronze Age, during the transition towards the Iron Age. From the eighth century BC, a succession of influences from the Mediterranean cultures has been revealed. In the case of Oretani, the predominance of the ceramics made by a potter's wheel by the fifth century BC is one of the traditional markers for the beginning of the Iberian culture (García-Gelabert and Blázquez 1992; García and Rodríguez 2000: 47-68).

The area occupied by the Oretani is difficult to specify (Figure 1). Livy (35.7.6) and Strabo (3.1.6) ascribe the centre area of Oretani to the inland regions of Iberia, with Sierra Morena as the structural base of the territory. They dwelled in the lands between the Upper Valley of the Guadalquivir, where Strabo (3.4.10) mentions the *Orospeda* "a wooded and rough place" and the modern La Mancha. The western limit of their territory was near the current division between the province of Badajoz and Ciudad Real. The *oppidum* of *Libissosa* (Lezuza, Albacete) was their eastern limit. The Campo de Montiel and the Sierra de Alcaraz divided Oretani and Bastetani territories. The Montes de Toledo did the same between the Oretani and the Carpetani and Celtiberians. Their geographical location made it possible for the Oretani to therefore control communication between La Meseta and the southeast peninsular coasts through the *Vía Heraklea* (Sillières 1990; López 1990).

Tradition and popular religiosity

Since prehistoric times, humans have found some elements in the natural landscape (mountains, caves, rivers, etc.) that, because of their characteristics and according to their cosmological conception, they

[1] The Oretani had urban sanctuaries at Alarcos and Cerro de las Cabezas (Ciudad Real) and, moreover, we must not forget that the sanctuary caves are related to urban centers.
[2] In Oretania, this kind of votive figures was found, in addition to the cave sanctuaries, in the urban sanctuary of Alarcos *oppidum* (Caballero and Mena 1987) and Mentesa Oretana (Benítez de Lugo and Moraleda 2013).

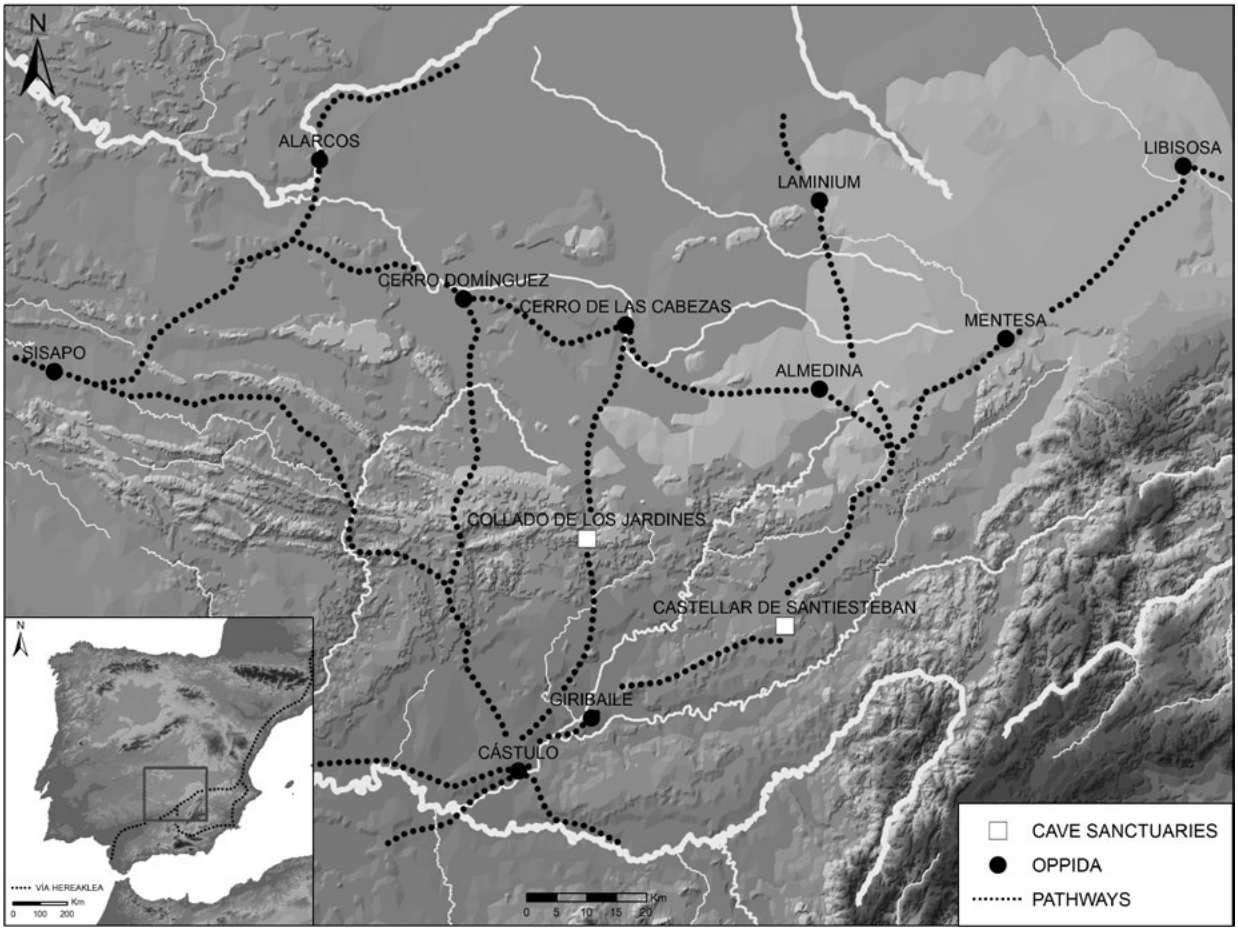

Figure 1: Map of Oretani territory and some of the most important oppida connected by some of the main pre-Roman roads.

considered symbolic. The symbolization of the landscape tells us about the perception of the society and the landscape elements of the everyday life are conceived in a symbolic universe with a sacred value.

On the whole, geographical and topographical units of the natural or everyday landscape are symbolized. However, in many cases some natural elements constituted the starting point for the standardization of the cult and therefore the ritual carried out. In Oretania, two rural sanctuaries are known, Collado de los Jardines (Santa Elena, Jaén) and Castellar (Jaén), probably two of the most important cult sites of the Iberian Peninsula.[3]

The cave sanctuaries

Normally, cave sanctuaries are a typically popular form of ritual site for rural communities. The identification of a 'sanctuary' depends on the following elements:

A) Shelters are produced via natural processes, next to a forest and a cliff. Cave bases often show signs of manipulation, likely in order to adapt the environment to cult practice. Evidence of use is apparent from as early as the Bronze Age (Nicolini *et al*. 2004: 143), but it is not known with precision the date in which these places started to be frequented with a symbolic purpose.

[3] Recent archeological works has started in a cave belonging to the *oppidum* of Giribaile (Vilches, Jaén), but its nature is not known at this time.

B) The ritual practices were carried out in a chambers series (Nicolini 1969: 37-43). The chambers also had a kind of natural platform that was interpreted as an offering table by Blázquez (1983:91).

C) Collado de los Jardines and Castellar sanctuaries found the presence of nearby natural springs (Prados 1994: 129; Nicolini *et al*. 2004: 151). Fresh water appears to have been necessary in Oretani ritual, possibly associated with purification. The water had a protective or even a therapeutic function in the settlement entrances (*Iberian therapeia*). The divine power in the cave was exerted as an opening of the underground world with the cult of earth and / or funeral divinities.

D) The forest probably promoted the idea of the existence of a *témenos*, in the sense of the divinity property. In Castellar sanctuary (Nicolini et al. 2004:160), Calvo and Cabré (1917) already suggested this hypothesis in the case of the Collado de los Jardines sanctuary, where they interpreted it as a sacred forest or *lucus*.

E) The accumulated cultural and votive objects were discovered at the foot of the natural platforms situated in the entrance of the caves. Nevertheless, the interpretation is difficult, as evident in the lack of archaeological contexts. It is not possible to know if is an offering deposit (Calvo and Cabré 1918: 22) or a dump created after the platform cleaning (Nicolini *et al.* 2004: 146).

Monumentalization and political sacralization

The practice of the Oretanian cult adapted to the circumstances, becoming gradually more visible during the fourth century BC. The cave sanctuaries were eventually built around. These spaces became a real complex consisting of caves, some buildings and streets. In this way, it is likely that access to these sanctuaries was restricted in certain areas.

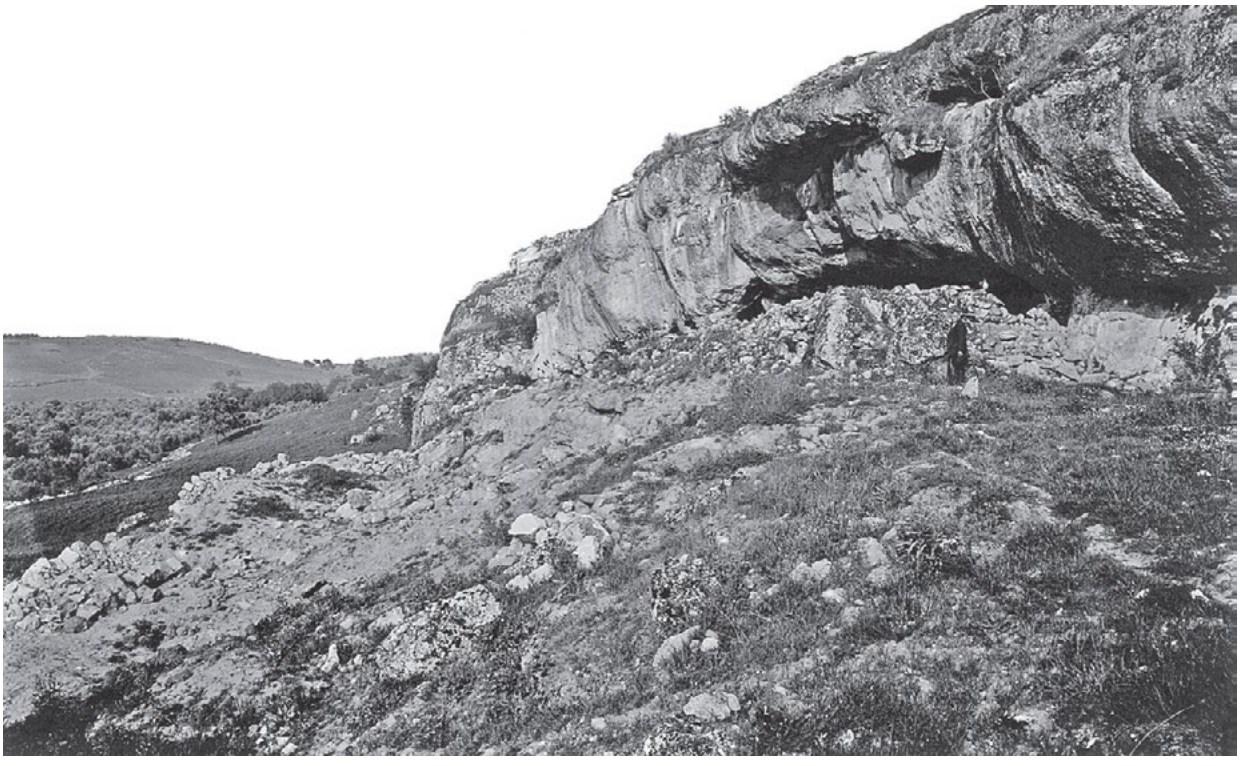

Figure 2: View of Castellar sanctuary in 1918 (Archivo Cabré, Instituto del Patrimonio Cultural de España, Nº Inv. 4275) (Copyright in the public domain).

Architecturally, the problems with the register prevent us from knowing the exact floor plan of these buildings. However, taking into account the orographic characteristics, the Oretani built different stepped levels in both cliff sanctuaries. Construction was initiated in both places at the same time (c. 500-300 BC) (Nicolini et al. 2004). The buildings associated with the caves are interpreted by Nicolini *et al.* (2004: 143-145) in the case of Castellar as houses or in Collado de los Jardines as a temple by Calvo and Cabré (1918).

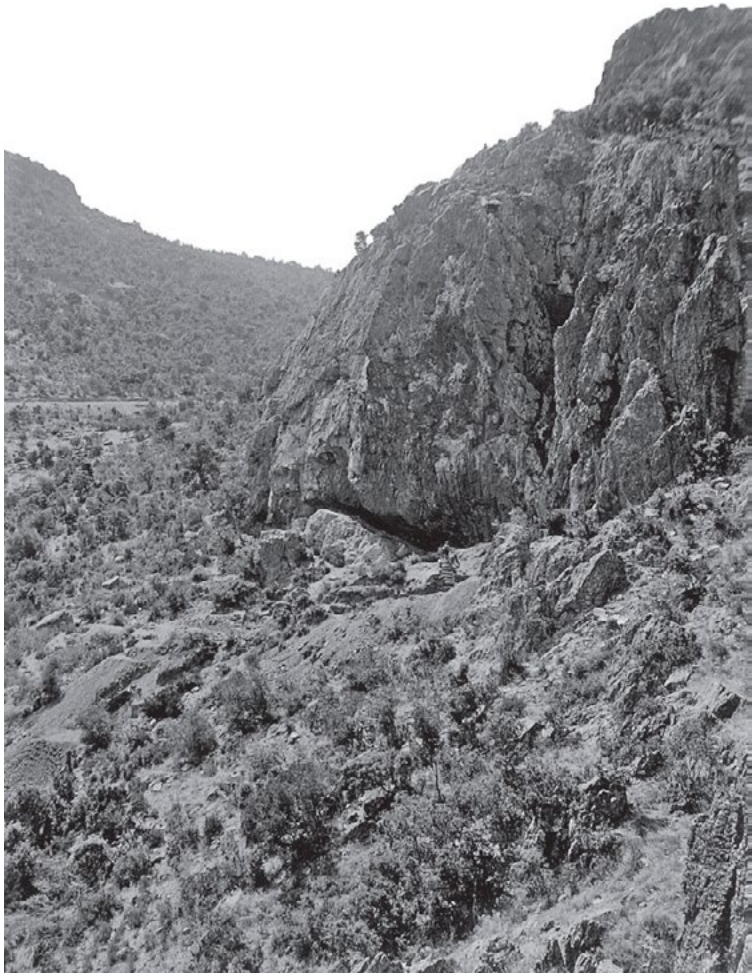

Figure 3: View of the hillside of Collado de los Jardines sanctuary (Santa Elena, Jaén) between 1916 and 1918 (Archivo Cabré, Instituto del Patrimonio Cultural de España, Nº Inv. 4771) (Copyright in the public domain).

The structures allow us to confirm the double intentionality of visual control: not only the ability to see, but also to be seen. They reflect the territorial control and the visual links. The purpose of the monumentality was promoted by added elements, as the discovery of Orientalising style capitals shows in Collado de los Jardines (Calvo and Cabré 1918: 22). The final complex was intended to impress and surprise visitors. The addition of terraces and structures outside the cave sanctuaries promoted the visual significance of the cult (Figure 3). This monumentalization directly relates the political dirigisme of the elite, who were responsible for the execution of buildings, influenced by the style of Greek sanctuaries of federal character. As a result, this is the moment of the conversion of the original cave sanctuaries of the popular tradition into supra-territorial sanctuaries, places where the elite from different Iberian regions met (Moneo 2003: 96).

It is possible to consider the existence of a dominant class responsible for the premeditated design of both complexes. At the same time, they are incorporated into a broader scope strategy. The Iberian elites played a key role in the organization of the space and used the religion as the perfect justification in the appropriation of the land. Strabo (3.2.11) tells us that the Oretani territory was organized around two urban centres in the Guadalquivir Valley: Oria-*Oretum* and Cástulo. The formation process of these territorial units is registered from the fifth century BC. The creation of the true *oppida* became an unequivocal sign of the Iberian elite, establishing a political supra-*oppidum* structure in the area of the countryside of Jaén (Molinos *et al.* 1994). This new territorial model was linked to a political model of aristocratic groups and the demographic expansion of the fifth and fourth centuries BC. The final result of the new territorial model was the consolidation of a strong social hierarchy.

After the crisis produced as a consequence of the Second Roman-Carthaginian Treaty in 348 BC,

the territory of Cástulo was consolidated (Rueda 2008a: 57-59). The Castellar sanctuary was created to reinforce the political occupation of the new territory and acting both of them as the physical and ideological borders of the new territory of Cástulo (Rueda 2011: 167, Figure 77). Thus, this geographical point was dominated because Sierra Morena is a very rich area in mineral resources and it is related to its near position to one of the main roads of the Iberian Peninsula: the *Vía Heraklea*.

A place for men and women

Among all the objects detected as offering for the divinities in these sanctuaries, the votive offerings made in bronze are the most impressive. They constitute more than the 90% of the global Iberian collection of the Iberian Peninsula. Rueda (2008b: 228) defends the *ex-voto* as "a representative image of the dedicant (εικών), a likeness testifying a moment, a religious sentiment". These votive figurines play, then, with a double meaning: they are offering an individual character, but public exhibition. The votive offering turning into a vehicle through the ideological structure put in contact the reality of the Iberian society with the religious, imaginary one.

These votive offerings represent anthropomorphic forms, anatomic parts and animals. The chronology of the *ex-voti* is established between the sixth and the second centuries BC and those from Castellar present a later chronology (fourth century BC) (Nicolini 1977). However, it is possible to make an anacronic interpretation. Some *ex-voto* show archaic elements (clothing, weapons, belts, etc.) result of a social and symbolic representation of power and prestige. This data may distort the manufacturing chronology figure.

An analysis of the votive offerings reveals more about the different rituals developed at the cave sanctuaries. Among these rituals are the so called "passing rituals",[4] which symbolize transition and the change from one state to another (Van Genep 1986). They are understood within a communal framework of celebratory rites, where an individual is believed to have passed from one stage of life to another (birth, puberty, etc.). Rueda (2013: 353) classifies five different passing rituals according to the *ex-voti*:

A) Warrior initiation rituals exclusive to the male sphere and the aristocratic elites. It was identified by the representation of warriors with the offering or exhibition of weapons.

B) Coming of age rites represent the access gate to an active social life. The initiation rituals related to young (*puberalli*) are promotional (Bernard 1986: 81-82). They imply introduction to the

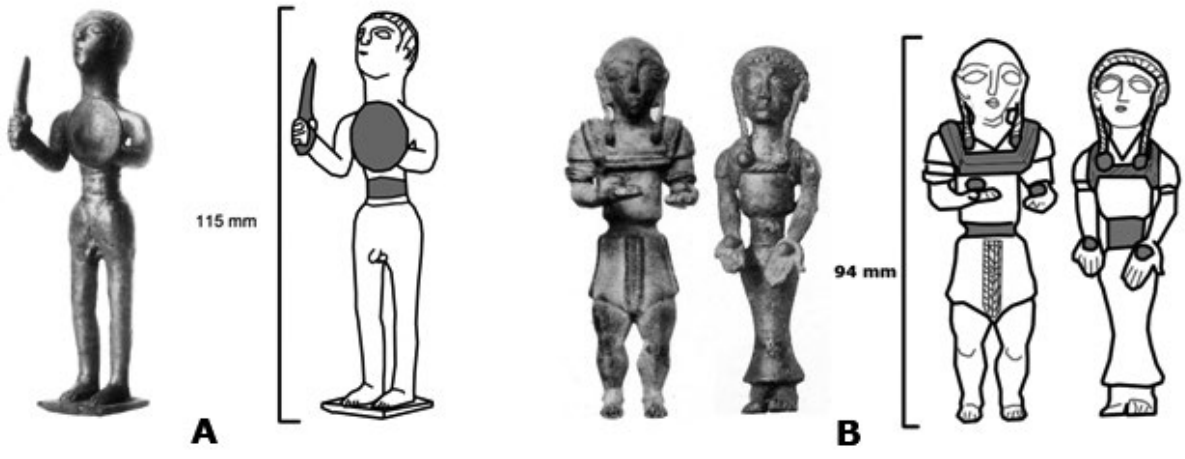

Figure 4: A: Ex-voto in a war initiation ritual (Álvarez-Ossorio 1941: Lám. XXXII, nº 202); B: couple in a coming of age rite (Álvarez-Ossorio 1941: Lám. CIV, nº 2360 and Lám. CII, nº 1374)

[4] This concept reminds us the rituals of peninsular Celtic world (Moya-Maleno 2007).

community and in the reproductive functions. The celebration place is the sanctuary of territorial character located at the ends of the land (Rueda 2013: 358). This factor implied a "forced trip" for young people and it supposed the temporary segregation of the group in order to reintegrate in it later with a different role. In addition, it implies the previous step to the execution of the couple rites. Some of the male and female *ex-voti* share the same outfit and attributes. Young people are represented offering two little round elements (bread rolls, fruits, etc.) and the outfit is very specific: cords are adjusted to the shoulders and are crossed in the back. Moreover, both sexes share the same hairstyle, two braids that fall down on their chest and finish in two balls, knots or hopps. The rite finishes with the haircut, it also could be another offering. The hairstyle change symbolizes the passing age. In the Iberian culture, there is not specific information about the age that the rites were carried out, but some Italian referents establish them about fifteen years old. (Torelli 1984: 22).

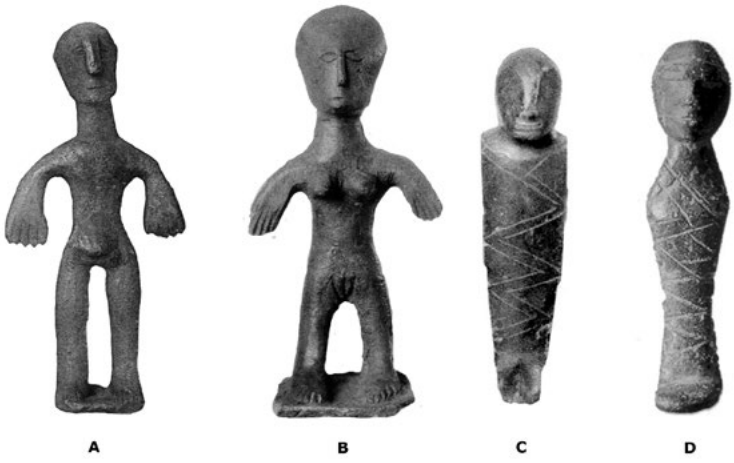

Figure 5: A and B: ex-voti associated to fecundity rites (Álvarez-Ossorio 1941: Lám. LIII, nº 358 and Lám. XXVII, nº 177); C and D: newborn (Álvarez-Ossorio 1941: Lám. XCV, nº 1332)

C) Nuptial rites: consists of the married and lies in the transmission of social identity to the person and therefore, the group identity that they belong to. Women hair is wrapped and hidden under a headdress characteristic of the matron image (the halo miter) while the man shows the tonsure.

D) Fertility rites are associated with the transition to a reproductive age (Figure 5A and B). The figures with shared attitudes for both genders are abundant. They use the repetition of anatomic and gestural attributes, above all the ones based on the nudity or the exaggeration of the representative organs of the gender. They also involve prosperity, fertility, health, gratitude or respect requests to the divine favours.

E) Gestation rites are actions of temporal character. They can cover several facets (protection, presentation and acceptance of the child rites). The examples of gestation rites between the Oretani *ex-voti* are exceptional (Figure 6). The evidence of child rites are also exceptional. The two votive offerings interpreted as newborn are testimonies to these rites.

Conclusions

The structural design of both complexes shows the creation of a common and cultural ideology for the whole social group. It implies a real religious regulation of everyday life and this detailed organization. It allows us to establish the existence of an elite who tried to remain in power. In order to obtain it, prestige elite was at the service of the religious sphere. At the same time, it allowed them the society control as well as the economic, territorial opportunities and also the communication. Presently, it is not known who is represented by the *ex-voti*. The aristocracy appears represented with their clientele class, but the degree of participation is not known. The standardization can be associated with the customer representation. Therefore, individuality is a clear symbol of distinction that must be related to class features.

Figure 6: Front view and profile of a pregnant woman ex-voto (Instituto y Museo Valencia de Don Juan, Nº Inv. 2591) (Copyright in the public domain).

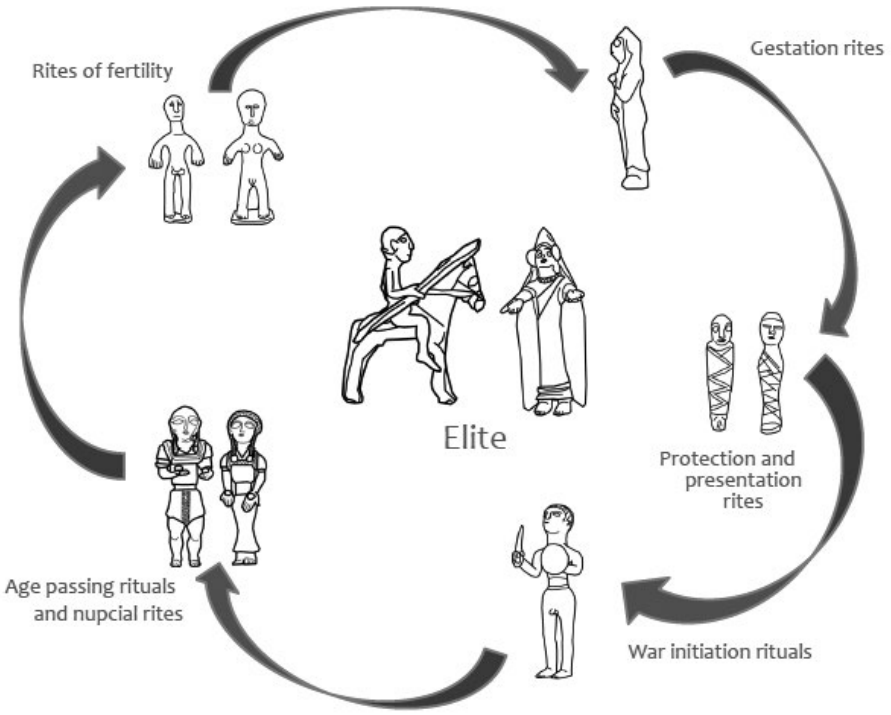

Figure 7: Scheme of the social operation rites and the cyclic conception of time.

This model is expressed through the rites of cyclic nature subject to a temporality within the biotic cycle, as a round-trip (Figure 7). In the Iberian case, it is not known the specific calendar for them, but in Italian contexts, they are linked to the beginning of spring (Torelli 1984: 50). The celebration of the vernal equinox means the start of the New Year (Moneo et al. 2001: 123-136). However, the ruling class evolution to aristocratic forms makes that the cult moves towards fecundity forms in relation to agrarian practice (Moneo 2003: 305).

This article shows an Oretani religiosity with a strong collective character and also marked by a liturgy with Iberian features. At the same time, Oretani religiosity is defined by their own characteristics, differing from their neighbours. The role of the couple reminds us to the couple construction of ancestors. It could go beyond time borders and the collective memory favours the survival of traditional schemes (Rueda 2013: 379). It also guaranteed the survival of the social *status* and the unity of the ethnic group.

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From Huts to Huts:
The Early Iron Age transition in the domestic architecture of Etruria

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In the Orientalising period (720-580 BC), a number of aspects of Etruscan domestic architecture changed in what has been referred to as a transformation "from huts to houses" (Brandt and Karlsson 2001: 7). However, changes to traditional building construction in the Early Iron Age (900-720 BC) appear to predate this supposed architectural transformation. By describing the materials and techniques used in domestic structures from the Early Iron Age (henceforth EIA) and contrasting them with the earlier Final Bronze Age (1200-900 BC), this paper aims to identify changes in building construction from the "huts" of the Final Bronze Age (henceforth FBA) to the "huts" of the EIA.

Discussing differences in the materials and techniques of building construction provides evidence for overall architectural change in relation to construction methods. This paper is separated into two halves, focussing on the FBA and the EIA, respectively. Each half contains subsections on the essential components in building construction, including:

1. Building shapes;
2. Foundation construction, and;
3. Wall and roof construction.

The conclusions therefore highlight the differences over time in building construction as a means of understanding architectural change between the FBA and the EIA. Ultimately, this paper is intended to lay the groundwork for discussions on Etruscan architectural change, particularly those challenging the common perception of an outright architectural transformation in the Orientalising period.

The evidence

The location of settlements during the FBA allowed for the foundations of many structures to survive. Beginning as early as the Middle Bronze Age, central Italian settlements clustered at both naturally defended sites and open, undefended sites (Pacciarelli 2000: 94). By the FBA, settlements at defendable sites had begun to grow, and some became what Pacciarelli (2000: 103) describes as village communities, or proto-urban settlements. As noted by Leighton (2013: 134-135), Rajala (2013), and Riva (2010:11-29), by the end of the FBA, the probable synoecism of previously undefended, open villages into more populous defended urban centres had begun. This pattern of synoecism later became more prominent in the EIA, when the majority of the smaller, undefended settlements of the Bronze Age were abandoned altogether.

With the extensive restructuring of settlements in the EIA, many FBA sites were not subsequently built upon following their abandonment (e.g. Scarceta, Sorgenti della Nova, and Torrionaccio-Le Grotte) (Pacciarelli 2000: 98-108; Perego 2001: 14-17; Rajala 2013: 2). In addition, the reorganisation of defensible settlements into more dense, proto-urban villages (e.g. Tarquinia) during the EIA further prevented the destruction of the more widely dispersed Bronze Age structures (Iaia, Mandolesi, Pacciarelli and Trucco 2001: 3-5). However, despite the general survival of FBA sites to today, buildings from FBA contexts generally do not survive beyond their foundations due to the perishable nature of their building

materials (Donati 2000: 316). Moreover, the dataset for the FBA is biased toward buildings with robust foundations, which generally survive better and are more archaeologically noticeable (e.g. Sorgenti della Nova).

In contrast with the FBA, the EIA was a transformative period in the prehistory of central Italy (Rajala 2013: 1-3). The evidence for EIA domestic architecture is therefore relatively limited when compared to either the FBA or the Orientalising period. In contrast with a number of important Bronze Age sites, occupation at EIA settlements often continued into the Orientalising period and beyond (Bartoloni 2013: 79-80; Riva 2010: 13-18), with some developing into major urban centres, such as Tarquinia (Linington 1982), Populonia (Cambi and Acconcia 2011), and Veii (Bartoloni 2006; Ward-Perkins 1959). As a result, later developments have destroyed, obscured, or, in some cases, reused EIA architectural features, making it difficult to create a broad sample of EIA architecture. Despite the limited sample size, evidence of EIA structures has been found at a number of well-excavated sites, including: San Giovenale, Tarquinia, Luni sul Mignone, Veii, and Acquarossa.

Furthermore, the majority of EIA architectural features discussed in the literature is from southern, inland Etruria. This bias largely results from a relative lack of architectural, ninth- and eighth-century BC data from northern Etruria. The earliest structures at Lago dell'Accesa (the principal site for early, northern Etruscan buildings) were probably built in the second half of the seventh century BC, in the Orientalising period (Camporeale 1985: 169; 2010: 145). Certainly, the excavations at Poggio del Telegrafo established that the northern Etruscan urban centre of Populonia was widely settled during the ninth century BC (Cambi and Acconcia 2011: 3-6). Moreover, evidence at Volterra hints at the similarity between Volterra and Tarquinia in the creation of EIA sanctuaries (Bonamici 2003: 36; Bonghi Jovino 2010). However, although EIA settlement evidence is abundant, few architectural features from pre-seventh-century BC contexts have been discovered at northern sites.

Buildings of the Final Bronze Age

Most buildings of the FBA were constructed using materials, and in some cases techniques, that had existed from at least the Middle Bronze Age (Domanico 2005). Key Bronze Age sites, including Sorgenti della Nova (Negroni Catacchio 1995), Scarceta (Poggiani Keller et al. 2002), Luni sul Mignone (Östenberg 1967; Wieselgren 1969), and Montereggioni-Campassini (Bartoloni 2001), demonstrate that, out of the various available materials, those used in the FBA were also largely similar to the ones used in the EIA and Orientalising period. In the instances of walling and roofing, the similarities are profound; for instance, wattle-and-daub, pisé, and thatch were manufactured materials used from the Bronze Age well into the EIA and, in some cases, beyond (Miller 2015: 406-450). Yet, despite the constancy of many of the materials used in construction, a number of essential building construction techniques were either unique to the FBA, or distinct from the characteristic building techniques used in the EIA.

Building shapes

The sizes and shapes of buildings in FBA contexts vary considerably. For the most part, buildings were not rectangular. Rather, elliptically shaped buildings appear to have been the norm. Many scholars, such as Colonna (1986: 390) and Pacciarelli (2000: 170), argue that an architectural chronology can thus be established based primarily on building shape. Despite this clear preference for elliptical building shapes, some buildings, particularly the so-called 'longhouses with large dimensions' (see below), are more rectangular than elliptical. The appearance of quadrilateral (e.g. Section Ve of Sorgenti della Nova) and rectangular buildings (e.g. the Northern Bronze Age Building of Luni sul Mignone; Figure 1) indicates that it is impossible to classify buildings of the FBA by shape alone.

Furthermore, a number of the FBA buildings discussed below have relatively large dimensions. For instance, the foundations for Abitazione 2 from Section III of Sorgenti della Nova suggest a building

approximately 11 x 8m (Dolfini 2002: 17). Several buildings with even larger dimensions have been discovered, such as the building at Scarceta (21 x 10m) or the Northern Bronze Age Building at Luni sul Mignone (30 x 4m) (Domanico 2005; Figures 1 and 2). However, as indicated by Sector Ve at Sorgenti della Nova (Cardosa and Passoni 2004: 143-145), buildings with smaller dimensions (<3 x 3m) were common in the FBA, with the circular/elliptical style of the so-called 'habitations with sunken floors' (see below) part of a longstanding tradition dating to the beginning of the Bronze Age, if not before (Cattani 2009). Therefore, while it may seem that the larger buildings are more prominent (particularly based on types established by Domanico [2005], discussed below), they are actually part of a wide spectrum of FBA building sizes.

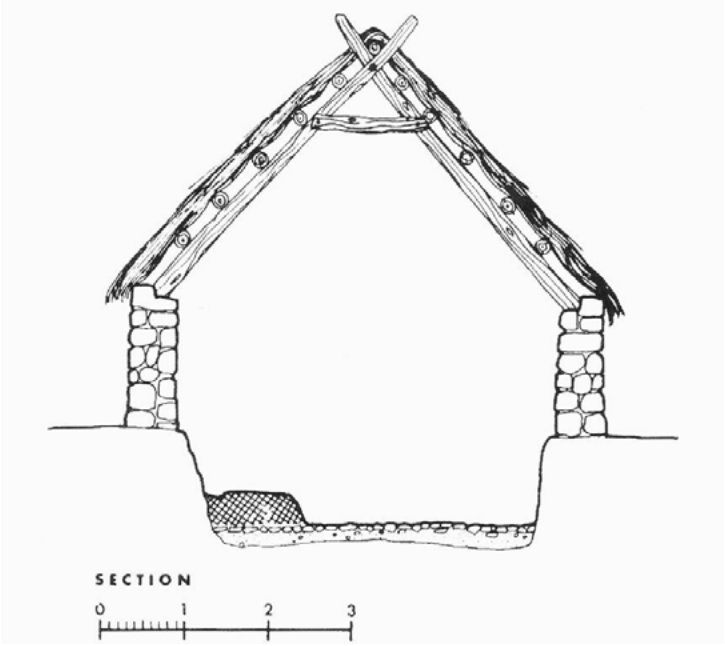

Figure 1: Illustrated reconstruction of Northern Bronze Age Building at Luni sul Mignone (Hellström 2001: 167, reproduced with permission).

Foundation construction

Some of the typical FBA foundation techniques differ from both previous Bronze Age and later EIA examples. Indeed, many of the wall footings in FBA building foundations are notably distinct from EIA examples. Both Domanico (2005) and Cattani (2009) discuss a few of the more typical materials and techniques used in the foundations of Bronze Age structures. Cattani (2009) focuses on the shape and size of structures, as well as certain elements of the foundations. Ground preparation techniques, in particular, interest Cattani, and he notes that certain forms of semi-subterranean structures predominate from the Middle Bronze Age (1600-1300 BC) until the eleventh century BC, when buildings set on levelled bedrock surfaces become more common.

Domanico (2005) further deconstructs Bronze Age buildings by foundation, resulting in four types of prevalent buildings:

1. Habitations with stone foundations;
2. Habitations with sunken floors/foundations;
3. Longhouses with large dimensions, and;
4. Habitations with foundations of parallel trenches.

Domanico Type 1, or habitations with stone foundations, is based on structures with cobble and rubble walls from sites such as Scarceta, Crostoletto di Lamone, Torrionaccio, and Luni sul Mignone (Domanico 2005: 514-517). Perhaps the grandest example of this type, the building at Scarceta Section D was set on soil, with the wall footings placed in shallow (10-15cm) foundation trenches (Poggiani Keller et al. 2002: 356-358; Figure 2).

Domanico Type 2, or habitations with sunken floors/foundations, describes semi-subterranean structures (Figure 3). A common type of building in the Bronze Age (e.g. Cattani 2009), buildings of this type

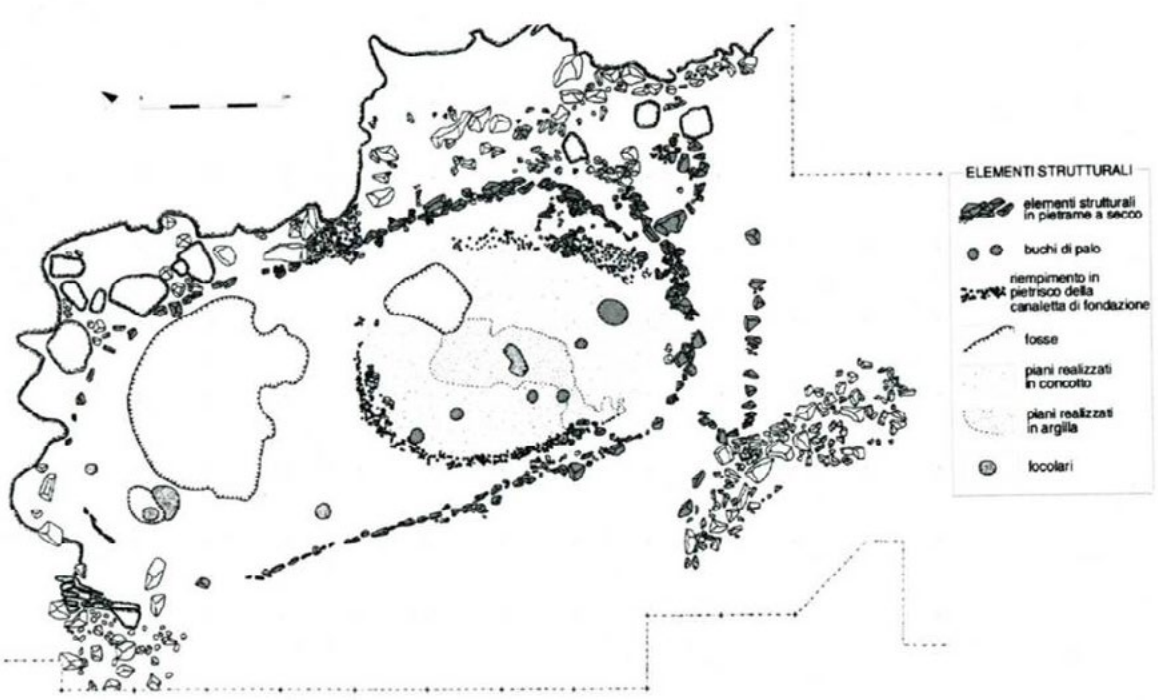

Figure 2: Plan of Scarceta Section D, Final Bronze Age Structure (Poggiani Keller et al. 2002: 359, reproduced with permission).

varied in depth and shape, with some buildings built into the ground two metres deep (Domanico 2005: 519). The foundations of the building were cut into either the bedrock or virgin soil, and the sides of the excavated stone or soil could be manipulated to form either a bench or part of the wall. Typically, the posts of the wall were then placed above the cut edge of the foundation, as in the examples from Sorgenti della Nova (Negroni Catacchio 1995; Figure 3).

Domanico Type 3 buildings, or longhouses with large dimensions, were constructed in a similar way to Domanico Type 2 (Figure 1). It is unclear what function these long, monumental structures had. The longhouse at Monte Rovello and one of the longhouses from Luni sul Mignone were originally built in the Recent Bronze Age

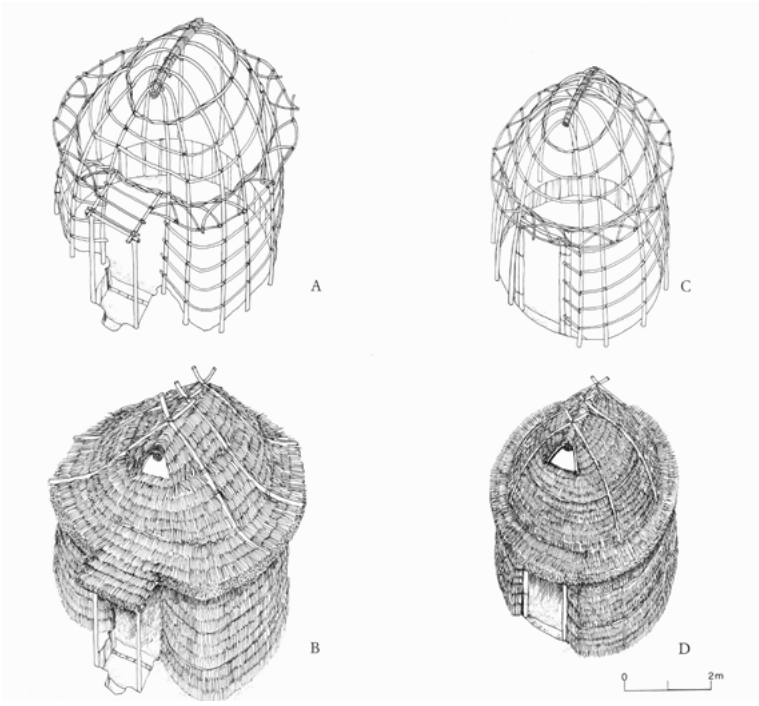

Figure 3: Illustrated reconstructions of Capanne 1 and 2 at Sorgenti della Nova Section I (Negroni Catacchio 1995: 318, reproduced with permission).

(1300-1150 BC) and were possibly reused in the FBA, with what appear to be differing functions over time (Hellström 2001: 166-168; Figure 1). However, Domanico (2005: 524) states that the function was domestic in nature, made clear by the appearance of hearths. Furthermore, at least in the FBA, both Domanico (2005: 524) and Hellström (2001: 166-167) agree that it is possible longhouses housed multiple families, at least based upon the multiple hearths discovered on the floors of the building at Monte Rovello. Despite these claims, the differences between these so-called hearths at each site suggests that, as indicated by Hellström, further research into function is necessary.

Domanico Type 4, or habitations with foundations of parallel trenches, in contrast with the types of buildings listed above, first appears in the FBA (Domanico 2005: 526; Figure 4). Constructed upon bedrock, channels cut into the bedrock were used in the place of wall footings. Typically elliptical in shape, Domanico Type 4 buildings of the FBA often contain interior posts and channels that indicate interior divisions of space. Domanico (2005: 531) mentions the similarity of these buildings to those found in Bronze Age Greece, and suggests that the appearance of Domanico Type 4 is part of a broader cultural change occurring in central Italy at the end of the second millennium BC, which includes the changing scope of regional trade and contact.

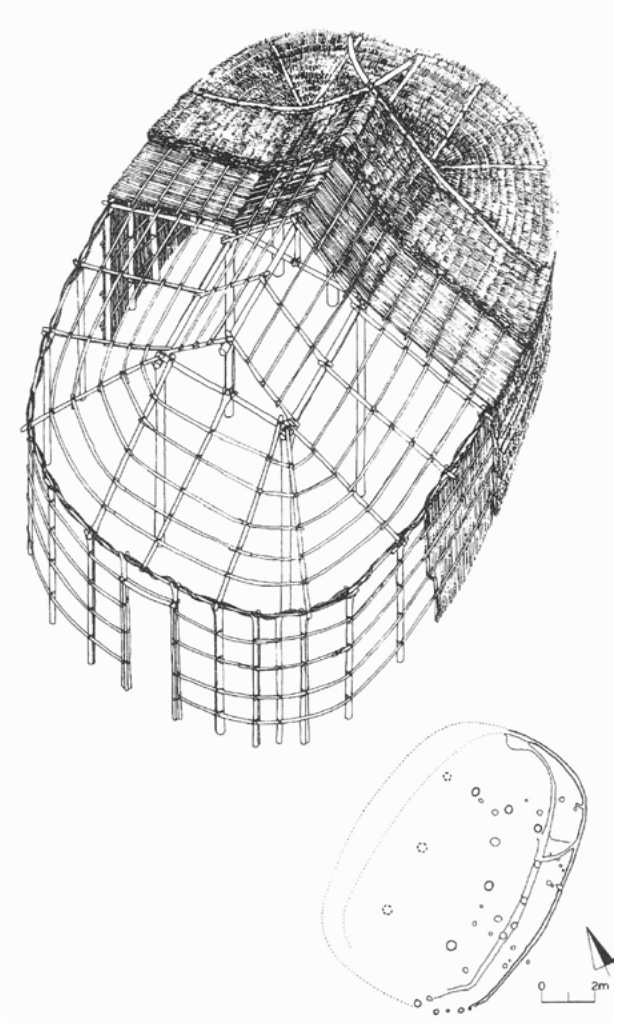

Figure 4: Illustrated reconstruction and plan of Abitazione 2 at Sorgenti della Nova Section III (Negroni Catacchio 1995: 342, reproduced with permission).

Wall and roof construction

In Bronze Age structures, it is likely that walling techniques were as diverse as the foundation techniques. Bronze Age walls, as well as EIA and Orientalising period walls, can be divided into two distinct groups: timber framed and self-supporting (Miller 2015: 294-296). Timber framing, usually seen in Domanico Types 2 and 4, was generally comprised of structural (e.g. the timber framing) and infilling (i.e. the use of materials, such as wattle-and-daub, to fill the timber frame) techniques. Self-supporting walls, commonly observed in Domanico Type 3 as well as some Type 1 foundations, did not have separate structural and infilling techniques, but instead used materials that accomplished both at the same time.

There is limited direct evidence of the walling and roofing techniques and materials for Bronze Age buildings beyond what is found in the foundations. It is widely assumed that wattle and thatch were the materials used in walls and roofs, respectively, but these materials are perishable and are not often recovered in context. As a result, the discovery of post holes is vital since they indicate both the vertical and horizontal structural elements of the building. Most interpretations are then based on modern *capanne*, as

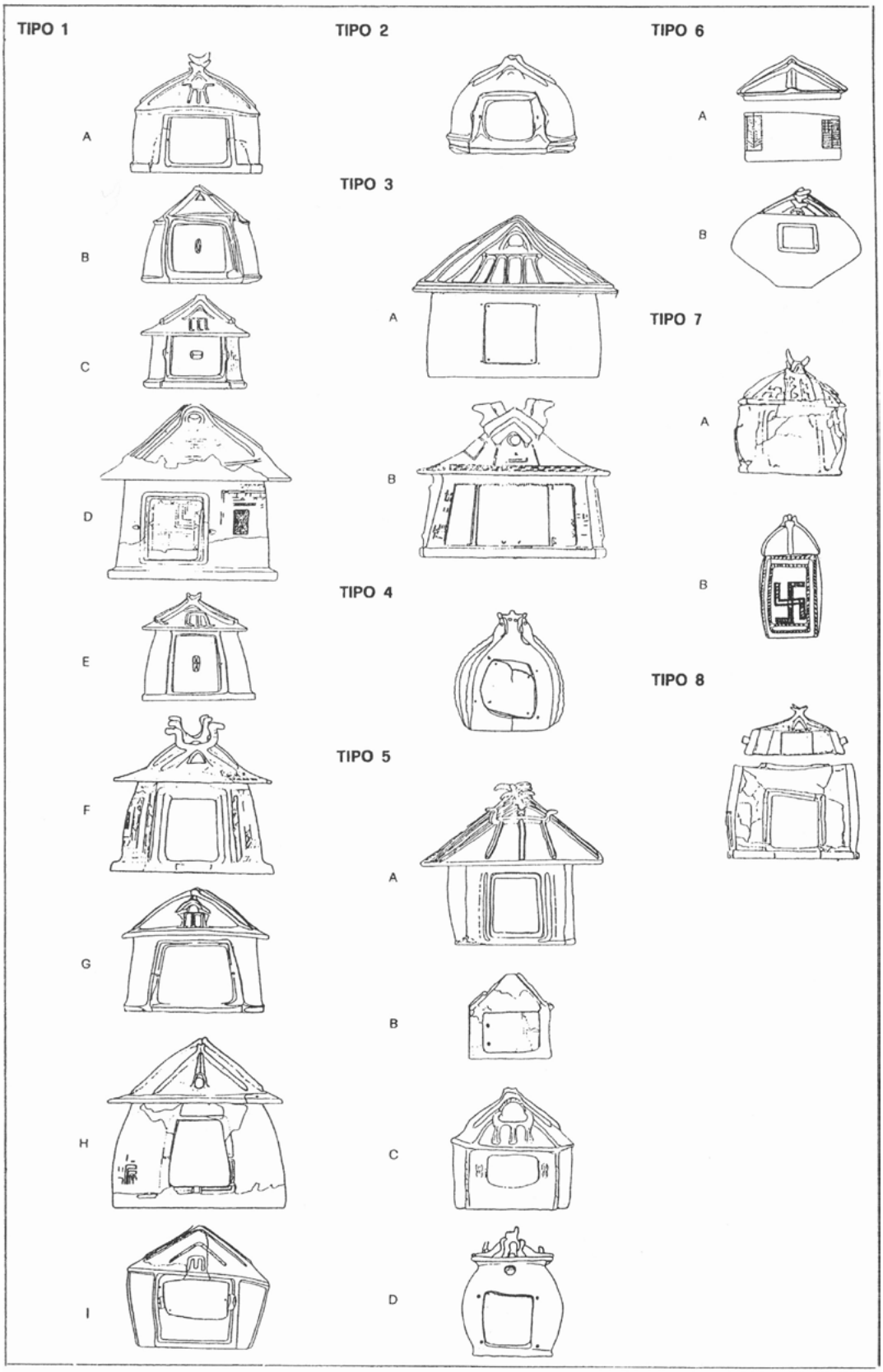

FIGURE 5: TYPOLOGY OF HUT CINERARY URNS AS DESCRIBED BY BARTOLONI ET AL. (1987: 123-133, REPRODUCED WITH PERMISSION).

well as EIA depictions in funerary evidence (Damgaard Andersen 2001: 245; e.g. Dolfini 2013: 139; Figure 5). Ultimately, the complexity of Bronze Age walling and roofing techniques has been lost in a much more noticeable way than in later periods, where walls of ashlar stones and roofs of terracotta tiles survive.

Building materials and techniques of the Early Iron Age

As with the FBA, the materials used in the buildings of the EIA did not significantly change from the established tradition, with the possible exception of the introduction of mud bricks in wall construction. Evidence suggests that foundations were constructed with both cut bedrock and portable stone, walls were made with perishable materials such as wattle-and-daub and pisé, and roofs were built with timber and thatch. Nevertheless, buildings of the EIA are distinct from FBA examples, changing away from traditional techniques in favour of previously unseen styles.

Building shape

At the beginning of the EIA, it appears that the building shapes remained primarily elliptical, as they had been in the FBA. However, the most archaeologically prominent of Domanico's building types, Domanico Type 4, appears to change in EIA contexts over time, initially in terms of building shape. Nowhere is this change in building shape more noticeable than at Tarquinia. The excavations of Calvario dei Monterozzi at Tarquinia produced example Domanico Type 4 buildings of both elliptical and rectangular plans (Figure 6). The excavator, Linington (1982; Linington et al. 1978), suggests that the buildings at Calvario were occupied simultaneously during EIA I and (possibly) II. According to Linington, the larger, elliptical buildings possibly served as outbuildings (for storage and stabling), whereas the rectangular buildings acted as domiciles. However, Colonna (1986: 390) and Pacciarelli (2000: 170) challenge this notion, proposing instead that the buildings represent different phases of settlement. They argue that the similarity between the elliptical structures at Calvario and other structures from the FBA, as well as the proximity and size of the elliptical and rectangular structures, indicates that the elliptical buildings preceded the rectangular ones.

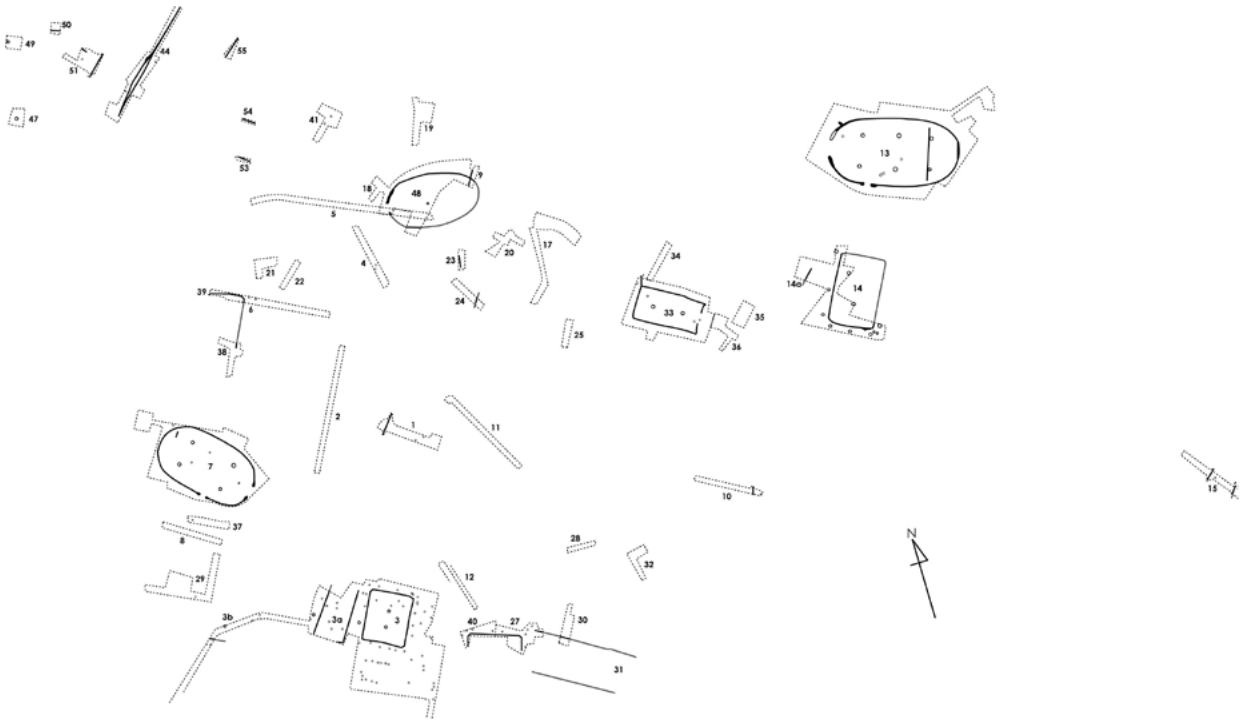

Figure 6: Plan of Calvario dei Monterozzi at Tarquinia (after Linington 1982: 252, reproduced with permission).

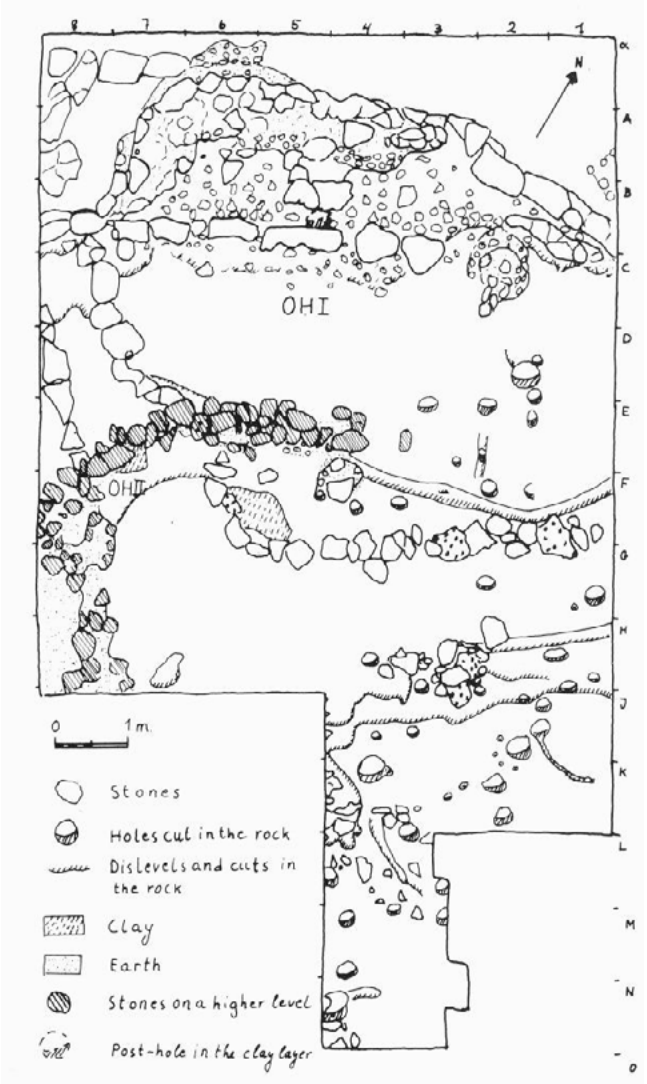

Figure 7: Plan of San Giovenale Area E (Pohl 1977: 14, reproduced with permission).

Evidence from the excavations at the Northwest Gate at Veii supports an evolution in building shape from elliptical to rectangular. The so-called Rectangular Timber Building was built in the mid-eighth century BC to replace an elliptical or possibly circular timber building at the same location (Ward-Perkins 1959). At Populonia, Cambi and Acconcia (2011: 5) mention that a seventh-century rectangular structure replaced an elliptical EIA structure built in the ninth century. However, Cambi and Acconcia (2011) do not describe the foundations of the structures in detail, so it is not clear what type of foundations were used at Populonia, though based on their description it is probable that the Iron Age structure was a habitation with foundations of parallel trenches. Nevertheless, it should be noted that rectangular structures were not an altogether new phenomenon in central Italy, but were instead only an evolution in Domanico Type 4 buildings. For instance, rectangular Domanico Type 3 buildings at Luni sul Mignone and Monte Rovello were probably built as early as the Recent Bronze Age (Maffei 1987; Östenberg 1967).

Foundation construction

EIA foundation techniques were not significantly different from that of the FBA, at least at the start. The most prevalent foundation techniques of both the FBA and the EIA were probably Domanico Type 2, although little evidence for these typically less permanent buildings survives. Most Bronze Age foundation techniques continue into the EIA and beyond. For example, the first phase of House I at San Giovenale Area F East, which fits Domanico Type 3, was built at the beginning of the Orientalising period. At Acquarossa Zone K, several Domanico Type 2 foundations were also discovered in late seventh-century contexts (Rystedt 2001).

Later in the EIA, buildings with foundations similar to Domanico Type 1 gradually replaced the previously common Domanico Type 4 buildings. In Area D at San Giovenale, an EIA habitation with foundations of parallel trenches, Capanna I, was slightly altered over time to include a platform of cobbles and rubble along one side of the building (Domanico 2005: 527-531; Malcus 1984). Similarly, the builders of Oval Hut I in Area E altered the traditional techniques used in Domanico Type 4 to accommodate the sloping bedrock of the area (Pohl 1977: 13-14; Figure 7). Located at the northern, steep edge of the acropolis plateau, Oval Hut I was partially built upon a terrace that flattened the ground between the more level bedrock and the cliff edge. While half of the building had bedrock-cut channels, the half of the building

that was situated on the earthen terrace had wall footings made of portable (i.e. not carved into the bedrock) stones. According to the excavator, the walls of the building were constructed of wattle-and-daub and not stone (Pohl 1977: 14).

The builders of the subsequent building in Area E, Oval Hut II, did not use bedrock-cut channels of any kind (Pohl 1977: 25; Figure 7). Instead, they artificially raised the ground level and erected foundations with wall footings made of cobble and rubble stone upon the new layer of soil. Since Domanico Type 4 was the established foundation style at San Giovenale prior to the mid-eighth century BC, this change from bedrock channels to wall footings made of portable stones, in addition to the setting of Oval Hut II on a prepared soil deposit, is significant (Karlsson 2006: 137; Malcus 1984; Pohl 1977: 14).

Although Area E contains the best-preserved example of the change in foundation techniques at San Giovenale, less intact evidence of buildings with portable stone wall footings from the eighth century can be found in Area F East and possibly in the Borgo quarter (Karlsson 2006: 137-141; Pohl 2009: 131; Figure 8). Further evidence for the mid-eighth-century appearance of buildings with portable stone wall footings can be found at Luni sul Mignone, where three successive phases of building continued from the middle to the end of the eighth century (Wieselgren 1969). The significance of the widespread appearance of buildings with portable stone wall footings in the eighth century BC is emphasised by the fact that the Etruscans did not build Domanico Type 4 buildings in urban centres following the eighth century.

Walling may also have changed in the eighth century BC. As with the foundations, the prominent building techniques and materials of the FBA, including wattle-and-daub and (possibly) pisé, continued into the EIA. Nonetheless, an association between portable stone wall footings and the introduction of mud brick as a building material has been made in the literature (Bartoloni 2012: 266; Izzet 2007: 152; Steingräber

Figure 8: The Borgo quarter at San Giovenale. Wall and roof construction

2001: 26). This association suggests that the use of mud brick in walls may have begun in the eighth century alongside the transition away from Domanico Type 4.

Unfortunately, there is little direct evidence for mud brick in EIA central Italy. In situ examples of mud brick were indeed found in seventh- and sixth-century BC contexts at Acquarossa (Wendt 1986: 60-61), Roselle (Bocci Pacini et al. 1975: 23; Laviosa 1970: 214), and Poggio Civitate (Phillips 1970; 1992: 13-14), but, prior to the seventh century, there are no clear examples of the material found in situ. It is therefore difficult to associate mud brick use to the widespread appearance of portable stone wall footings in the EIA.

There is also no clear evidence for a change in typical roofing materials from the FBA to the EIA. Depictions of roofing are the primary form of evidence used to determine EIA roofs. Damgaard Andersen (2001) presents a thorough re-examination of the roofing evidence, with particular focus on the so-called "hut" urns. Using the roof pitch as an indication of roof type, she identifies depictions of thatched roofs against later tiled roofs, noting that the cinerary urns of the EIA are thatched (Damgaard Andersen 2001: 245). Interestingly, Damgaard Andersen (2001: 254) mentions that thatch might have been clay-revetted in the EIA, which may indicate a kind of material precursor to terracotta tiles.

Although roofing materials probably did not change from the FBA to the EIA, there is some evidence that certain techniques did. In FBA buildings, a three-aisle system of posts is predominant, as exemplified by Abitazione 2 at Sorgenti della Nova Section III (Dolfini 2002; Figure 4). This system remains prominent until the eighth century BC (e.g. San Giovenale Area D Capanna I and Veii 'Timber Structure from the Earliest Age'), when two-aisle systems appear in both the rectangular Domanico Type 4 buildings at Calvario and possibly Oval Hut I of San Giovenale Area E (Figures 6 and 7).

This change in the system of posts indicates a possible transition in the roof structure. The three-aisle system of posts, as demonstrated by Büchsenschütz (2001; 2005),

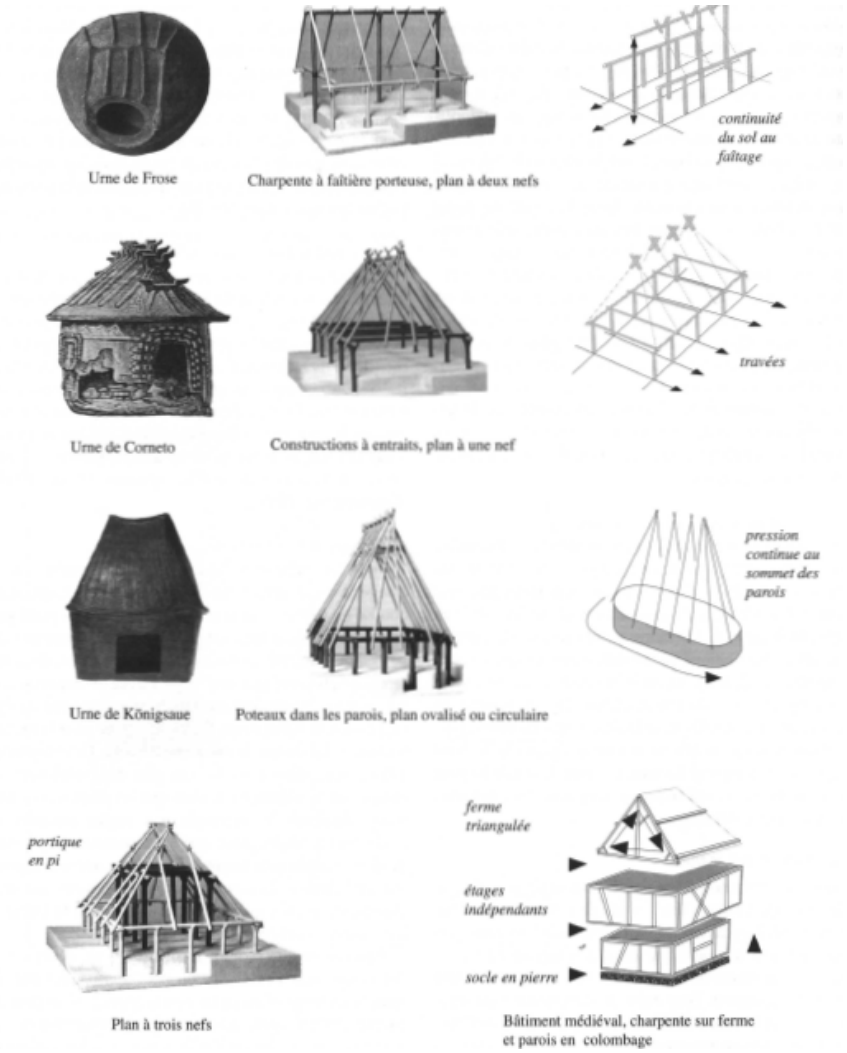

Figure 9: Diagram of post systems and roof support types (Büchsenschütz 2005: 56, reproduced with permission).

allows the formation of a rectangular frame of purlins/collar beams, which is supported at the joints by the posts (Figure 9). The result is often a hipped roof, where all sides of the roof slope to the apex. In contrast, Büchsenschütz (2005: 55) indicates that the two-aisle system of posts is often used to support a central ridge pole (Figure 9). Depending on the location of the posts, a ridge pole can be indicative of a saddle roof, where only two sides of the roof slope to the apex of the roof, leaving two gabled ends. Although the evidence for roof supports is too thin to substantiate a transition between hipped and saddle roofs, the shift from a three-aisle to two-aisle system hints at clear alterations in the use of structural elements in the roof, with the disuse of collar beams particularly notable.

Conclusions

The differences over time in building construction are a means of understanding change between the FBA and the EIA. In the EIA, changes in:

1. Shape to predominantly rectangular structures;
2. Foundations to wall footings of portable stone on soil deposits, and;
3. Roofing from a three-aisle to a two-aisle post system

resulted in notably different architecture than that of the Bronze Age. These changes in how the buildings were constructed indicate that, although the buildings of the FBA and the EIA used many of the same, traditional materials, they were not similar. The changes in building construction witnessed here are emblematic of the wider transformation in settlements of the period, where traditional aspects of the Bronze Age appear to have been overturned in favour of concepts that would take hold later in the first millennium BC. This more nuanced impression of FBA and EIA buildings thus provides further evidence for a cultural change between the two periods, and suggests that later changes to architecture may not have been as radical as is often depicted.

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A reconsideration of the distribution of crannogs in Scotland

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Crannogs are a critical aspect of the settlement history of Scotland, and represent a building tradition that spans from the Early Iron Age to the early Modern period (Crone 2012). Known for their outstanding waterlogged preservation conditions, there are over 500 recorded crannogs and some suggest that as many as 1000 still survive (Dixon 2004; Henderson 1998b: 289). Each of these islet structures can add much to our knowledge of prehistoric (and historic) settlement. The sheer quantity of well preserved remains found on crannogs should be recognised as an opportunity to not only better understand crannogs but also elucidate details of wider settlement patterns across a great span of Scottish history. Nevertheless, this potential has rarely been realised. This can primarily be attributed to the difficulty in excavating these submerged or waterlogged sites resulting in a lack of primary data, but also owing to our lack of understanding regarding some of their most basic characteristics – morphology, chronology and distribution. Indeed, debate remains concerning even a basic definition of the site-type, some arguing the term crannog should be period specific, defined by morphology, or should simply refer to any occupied island with substantial elements of artificiality (see Harding 2000; Henderson 1998a; Lenfert 2012: 47-71, for discussion on definition of 'crannog' as a site-type). The last of these definitions will be used here so as to be as encompassing as possible. Crannogs are widely accepted as having a western or Atlantic distribution in Scotland (Cavers 2010: 26-36; Henderson 1998a: 240-2, 2009), but this assumption has never been adequately tested particularly with regard to how crannogs have been affected by Improvement period loch drainage.

The effects of loch drainage on crannog survival have been noted before (Hale 2007: 275; Morrison 1985: 2), however no attempt has been made to quantify this effect. Through an analysis of the Roy Military Survey of Scotland (1747-1752) (RMS hereafter), it is apparent that Improvement period drainage altered the landscape at different rates and times throughout Scotland. Loch drainage was occurring earlier and more intensely in eastern regions of Scotland which has probably resulted in the loss of the majority of crannogs in these regions (Stratigos in prep). Furthermore, later loch drainage during the second half of the 19th century in southwest Scotland served to help record crannog sites by making them accessible at a time when interest in lake-dwellings had been spurred by discoveries across Europe (see Midgley and Sanders 2012). These early investigations also put in place a corpus of work which has influenced very recent research strategies for the survey and excavation of crannogs. More recent investigations have helped to re-establish and perpetuate the idea that crannogs are a western or Atlantic phenomenon. However, the potential for crannogs to have survived drainage is possible (see Barber and Crone 1993), and in eastern Scotland, there are recorded examples of a handful of crannogs in drained contexts. Through a re-examination of the specific areas of loch drainage identified through the RMS analysis (Stratigos in prep), this paper will propose a list of possible crannog sites that have been recorded as various other archaeological site-types. Given the presence of these possible crannogs combined with the recorded number of crannogs from eastern Scotland, it will be suggested that crannogs are not the western or Atlantic phenomenon as has been proposed elsewhere (Cavers 2010: 26-36; Hale 2007: 278; Henderson 1998a: 240-2, 2009; Lenfert 2013: 132-34), but they were built across Scotland. These observations have significant implications for both our understanding of the Iron Age and other periods, but also for how future research strategies are designed and implemented on crannog sites.

State of Research: Crannog distribution and the legacy of drainage

Although there are a small number of crannogs recorded from the late 18th century onwards, it was the emergence of archaeology as an academic discipline coupled with the discovery of lake-dwellings on the continent and crannogs in Ireland that sparked investigations of crannogs in Scotland. The discovery of seven crannogs in Dowalton Loch, Dumfries and Galloway after the loch was drained in 1863 was the first indication that crannogs might be a very widespread phenomenon in Scotland (see Stuart 1866). Following on from the Dowalton discoveries, Robert Munro was the first to excavate crannogs systematically and record in detail what was uncovered (Munro 1882). Munro's excavations were ahead of their time in their rigorous execution and recording, although not to what would be considered modern standards (Midgley and Sanders 2012: 30-1). Nearly all of Munro's work resulted from these curious structures being found following loch drainage by a local farmer or a landowner (e.g. Lochlee and Buiston crannogs). Those early excavations still represent a major portion of the corpus of research on crannogs (Dixon 2004: 60). The first half of the 20th century saw very few programmes of research on crannogs, and when sustained research on crannogs returned in the 1970s, research strategies were informed by the legacy of Munro's and other antiquarians' work that was inescapably focused on the southwest.

Crannogs have consistently been considered to have a western or Atlantic distribution. This distribution was first proposed by Munro (1882: 242-59) and has been more recently repeated (Cavers 2010; Hale 2007: 278; Henderson 1998a: 240-2, 2009: 39-40; Lenfert 2013). However, the distribution of crannog sites in Scotland is biased by the history of research on crannogs which has seen programmes of survey return repeatedly to areas which have been known to have crannogs with other regions seeing no targeted searches for crannogs. Only three lochs have been systematically and entirely surveyed for crannogs in Scotland – Loch Awe (McArdle *et al*. 1973), Loch Tay (Dixon 1982), and the Lake of Mentieth (Henderson 1998b). Other survey programmes for crannogs have deliberately been regionally targeted - the South-West Crannog Survey (Henderson 2004), the Scottish Wetland Archaeology Programme (Henderson *et al*. 2006), The Perthshire Crannog Survey (Dixon and Shelley 2006) (Figure 1). Each of these survey programmes have identified and confirmed more crannogs in the regions where the study was located. The previously known crannogs were recorded mostly during 19th century antiquarian investigations. The regional bias is even more pronounced when we consider the excavation of crannogs which has been heavily concentrated in southwest Scotland (Figure 2).

While it is clear that the majority of recorded crannogs are to be found in western areas of Scotland, what is surprising is the more recent rejection of the idea that crannogs can be found in other regions also. This is demonstrated in the suggestion that, 'the revised western-orientated densities of sites suggest not only that crannogs are chronologically significant but also that they are culturally specific and should be regarded as a characteristically western trait' (Henderson 2009: 40). This stance is based on the modern distribution of known and possible crannogs, as recorded in the National Monuments Record of Scotland, which has simply been accepted as representative of the past distribution of sites in some instances (see Cavers 2010: 26-36; Henderson 2009: 39-40). This has perhaps influenced modern survey programmes and dubiously re-affirmed the western distribution, as there have been no systematic field surveys for crannogs from the modern councils of Moray, Aberdeenshire, Aberdeen City, Angus, Dundee City, Fife, Clackmannanshire, Falkirk, West Lothians, City of Edinburgh, Midlothian, East Lothians and the Scottish Borders (Figure 3). However, there are crannogs in eastern parts of Scotland (Hale 2007; Stratigos and Noble 2014), and there is no reason that further crannogs would not be found in these regions if they were systematically searched for as has been done in other regions. Such targeted work would test the hypothesis that crannogs are predominantly a western or Atlantic site-type.

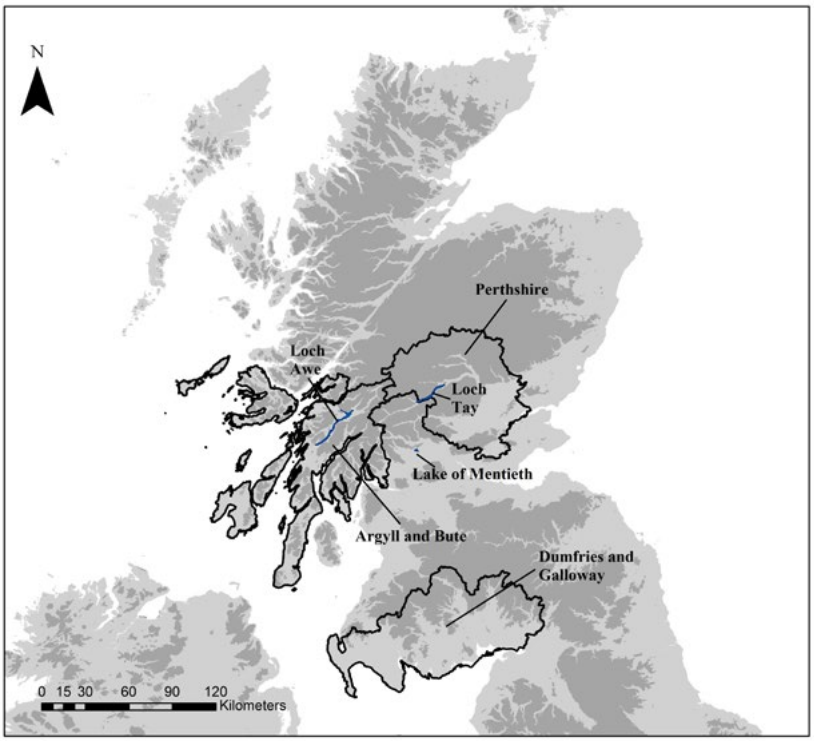

Figure 1: Outlined regions have been systematically surveyed for crannogs, and this focus has been particularly intense in Dumfries and Galloway. Regions outside of these areas have seen little targeted assessments of crannogs.

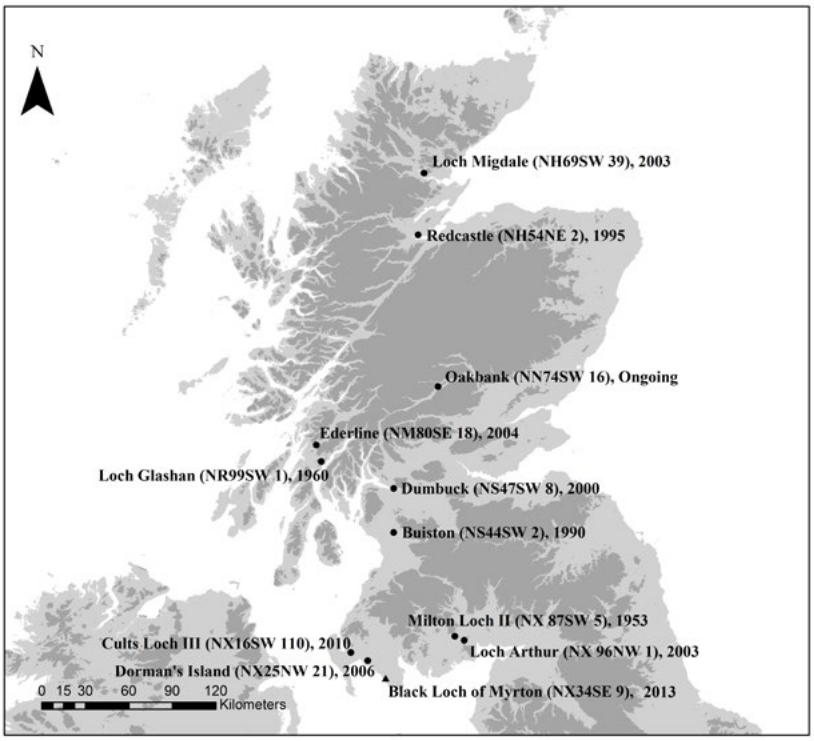

Figure 2: Name (NMRS Site Number), Date last excavated. Crannogs that have been excavated since 1950, note the focus on southwest Scotland (5 of 12 having taken place in Dumfries and Galloway alone). The triangle represents Black Loch of Myrton which has been interpreted by the excavators as a loch-side dwelling rather than a crannog (Cavers and Crone 2013: 61). However, the site remains listed as a crannog in the National Monuments Record of Scotland.

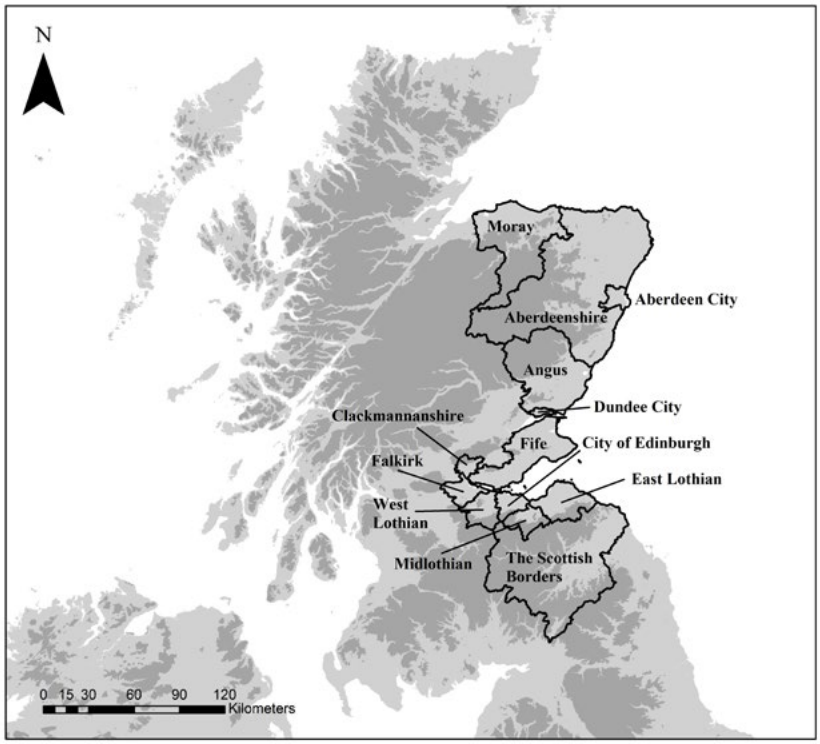

Figure 3: The outlined areas are the modern councils in which no systematic searches for crannogs have taken place.

Research Aims and Method

In order to test the perceived distribution of crannogs as a western or Atlantic phenomenon, crannogs must be systematically searched for in areas where they have not previously, and account must be made of how loch drainage may have impacted these areas with regard to the quantity of sites. It is clear that previous crannog research has focused on areas where crannogs were known to have existed in significant numbers, and that these areas are in regions where antiquarians were most active. With this in mind further questions to explore are whether it is possible to link loch drainage of the 18th and 19th centuries to the research history of crannogs and, by extension, critically assess the apparent disparity in crannog numbers seen between eastern and western areas. Using the results of an analysis of the RMS and other historic records which shows that loch drainage was taking place at different times across Scotland, are there recorded features which might be crannogs on the basis of their presence in a former loch.

These questions were answered by using the results of an analysis of the RMS where lochs were identified and their present condition and their condition depicted on the First Edition Ordnance Survey (c. 1860-1875) were assessed (Stratigos in prep). The analysis was made over all of mainland Scotland - the area which is mapped on the RMS. The method was to simply search through each sheet of the RMS and note the spatial reference for each loch using the National Library of Scotland's online version of the RMS (Figure 4). As the RMS is more of a sketch of the country rather than an accurate map, the location of the individual lochs had to be located in real-world coordinates which relied on historic and modern editions of the Ordnance Survey. This analysis resulted in 1796 lochs being identified, 1745 of which were successfully located (Figure 5). In some cases, the paleoshorelines of lochs could be reconstructed using the Ordnance Survey Digital Terrain Model (10x10m) with the reconstructed water level based on a variety of indicators (Figure 6; Stratigos in prep). From within these specific lochs and drained lochs,

Figure 4: Screenshot of the former Loch Auchlossan as depicted on the RMS at NJ 581 005 on the National Library of Scotland's online version (Sheet C.9.b 20/1a, © British Library Board). This is an example of a loch that was drained before the production of the first edition of the Ordnance Survey in this region, and has a possible crannog, The Houff (NJ50SE 4). A possible paleoshoreline of the loch is shown in Figure 6.

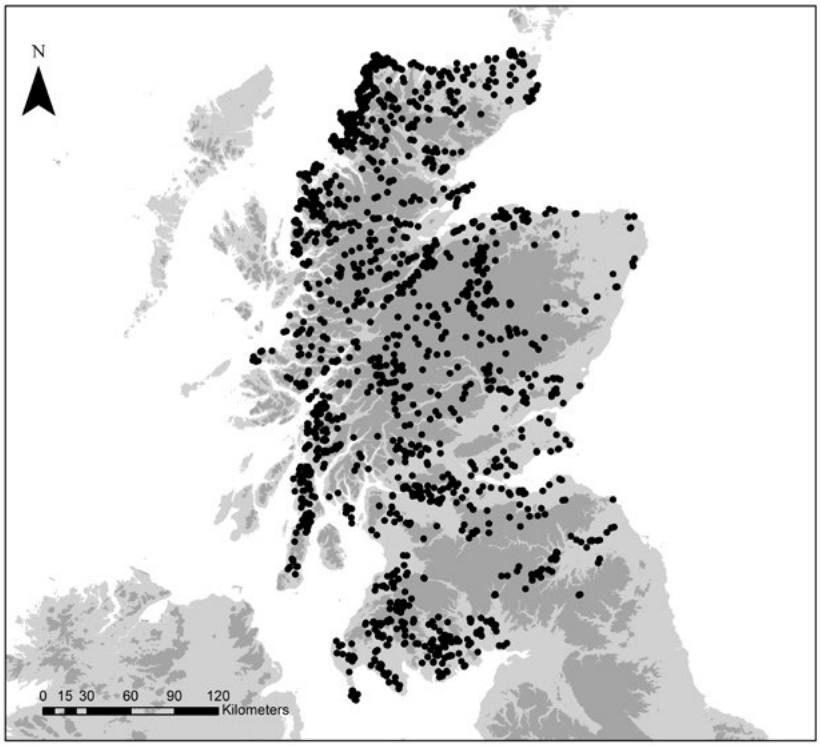

Figure 5: The 1745 identified lochs that are depicted on the RMS (Stratigos in prep).

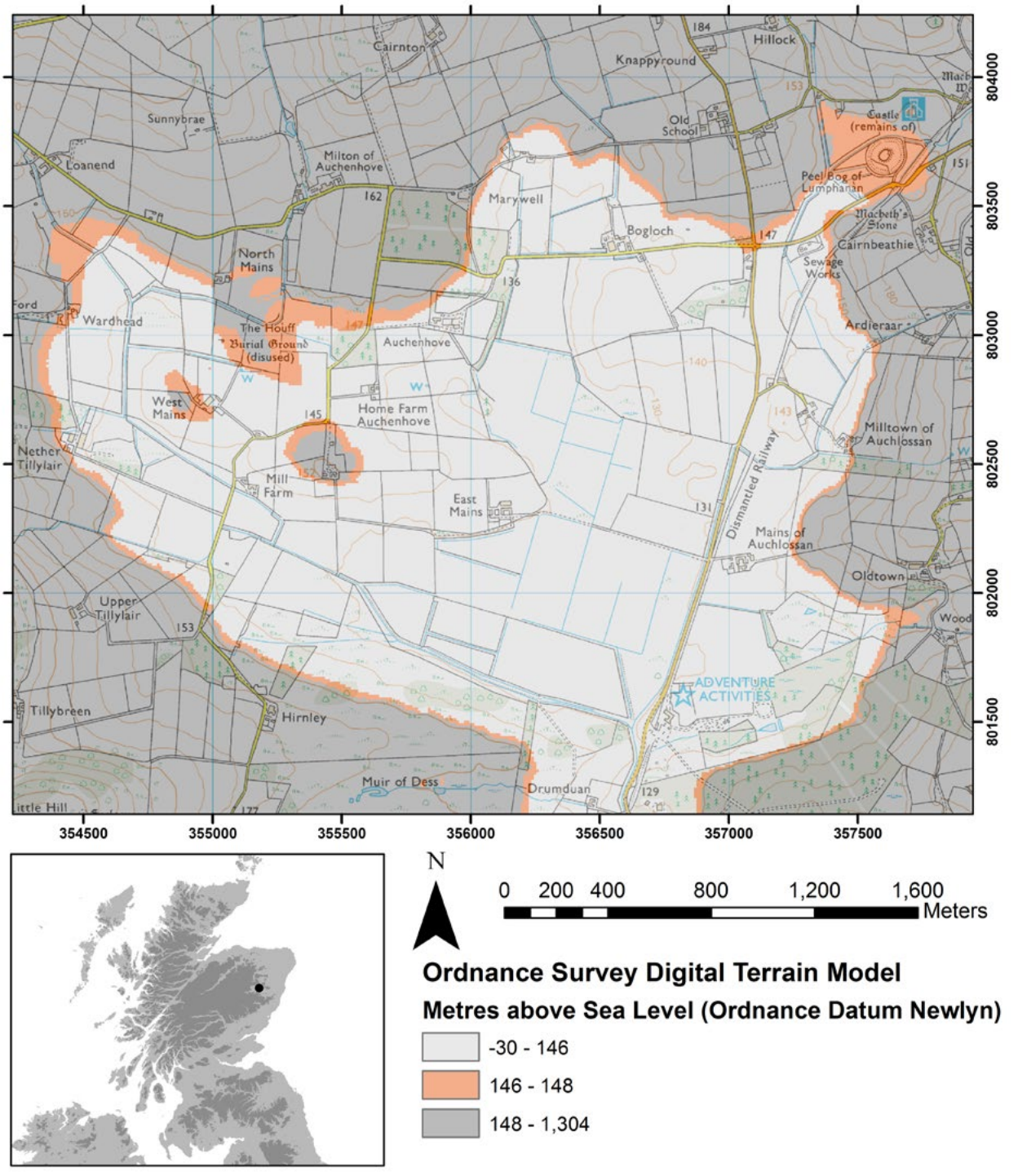

FIGURE 6: THE AREA OF THE FORMER LOCH AUCHLOSSAN WITH POSSIBLE PALEOSHORELINE INDICATED IN ORANGE. IN THIS INSTANCE, THE PALEOSHORELINE WAS SUGGESTED ON THE BASIS OF AN ARCHAEOLOGICAL FEATURE WHICH WAS INTERPRETED AS BEING A TRACKWAY WITHIN THE FORMER LOCH (SUTHERLAND 1989). THE UPPER LIMIT OF THE SUGGESTED PALEOSHORELINE IS AT THE SAME HEIGHT ABOVE SEA LEVEL AS THE TRACKWAY (© CROWN COPYRIGGHT 2014).

sites that could reasonably be considered to be a crannog were noted as possible crannogs. These sites have been recorded as a range of other archaeological site-types in the National Monuments Record of Scotland and include, mottes, mounds, natural features, cairns, and castles among others. The reason these sites have been considered here as possible crannogs is due to their likely location within a former loch and the resemblance their descriptions have to known crannogs. Those descriptions have been compared to the known characteristics of crannogs in drained contexts which have been gauged here through assessing previous site descriptions of crannogs in drained contexts (see Munro 1882; Barber and Crone 1993; Henderson *et al*. 2003; Cavers 2010). Sites from within lochs depicted on the RMS which have been recorded as island dwellings, fortified islands, islands, and other crannog-like classifications have also been assessed and added to this list of possible sites where their description is consistent with a possible crannog, where they are not listed elsewhere as a crannog and where no modern archaeological investigation of the site has demonstrated conclusively otherwise.

Results

The above methodology identified 78 sites recorded in the National Monuments Record of Scotland from within areas of loch drainage (Figure 7). In addition to these sites, 10 possible crannogs recorded elsewhere in eastern Scotland can be seen in Figure 8. Of the 88 sites in total, 35 are from within what is considered here as eastern Scotland. When added to previously recorded crannogs and possible crannogs (n=15), there are total of 50 crannogs and possible crannogs in eastern Scotland and the resulting distribution map of sites across Scotland is noticeably less centred on western areas (Figure 9).

Name	NMRS ID	Loch	Council	Situation
Bishop's Palace	NJ50SE 4	Bishop's Loch	Aberdeenshire	Lowered
Inverallochy Castle	NK06SW 4	Loch Faulds	Aberdeenshire	Drained
Loch Kininmonth	Unrecorded	Loch Kininmonth	Aberdeenshire	Drained
Round Top	NK03SW 4	Meikle Loch	Aberdeenshire	Lowered
The Houff	NJ50SE 4	Loch Auchlossan	Aberdeenshire	Drained
Castle Hill	NO45SE 19	Forfar Loch	Angus	Lowered
Castleton of Eassie	NO34NW 5	Unnamed	Angus	Drained
Baikie Castle	NO34NW 4	Unnamed	Angus	Drained
Graham's Knowe	NO24SE 6	Unnamed	Angus	Drained
Hynd Castle	NO54SW 10	Unnamed	Angus	Drained
Loch Lee crannog	Not recorded	Loch Lee	Angus	Dammed
Pitscandly Earth House	NO45SE 31	Restenneth Loch	Angus	Drained
Restenneth Priory	NO45SE 10	Restenneth Loch	Angus	Drained
West Inch	Not recorded	Forfar Loch	Angus	Lowered
Eilean Tighe Bhain	NN02SW 13	Loch Tromlee	Argyll and Bute	No Change
Laggan Mound	NM82NW 127	Potter Loch	Argyll and Bute	Drained
Loch a'Chuirn	NR74NE 4	Loch a' Churin	Argyll and Bute	Drained
Loch Nant Building	NN25SW 24	Loch Nant	Argyll and Bute	Dammed
Bishop's Mansion	NS66NE 6	Bishop's Loch	City of Glasgow	Drained
Boreland of Clovend	NX85SE 3	Barlay Loch	Dumfries and Galloway	Drained
Burned Island	NX67SE 41	Loch Ken	Dumfries and Galloway	No Change

Figure 7: List of possible crannogs identified. (1)

Name	NMRS ID	Loch	Council	Situation
Caslte Island	NX25SE 7	Caslte Loch	Dumfries and Galloway	No Change
Culte Mote	NX15 NW 2	Loch Fergus	Dumfries and Galloway	Drained
Fern Island	Unrecorded	Fell Loch	Dumfries and Galloway	Lowered
Fir Island	NX76SE 9	Carlingwark Loch	Dumfries and Galloway	Lowered
Inch Crindil	NX16SW 17	White Loch	Dumfries and Galloway	No Change
Larid's Isle	NX87SE 12	Lochrutton Loch	Dumfries and Galloway	No Change
Loch Lurkie Motte	NX77SW 2	Loch Lurkie	Dumfries and Galloway	Lowered
Loch Maberry Castle	NX27NE 1	Loch Maberry	Dumfries and Galloway	No Change
Lochinvar Castle	NX68NE 1	Lochinvar	Dumfries and Galloway	Dammed
Lochside Motte	NX97NE 7	College Loch	Dumfries and Galloway	Drained
Long Castle	NX34NE 6	Dowalton Loch	Dumfries and Galloway	Drained
Mill Loch	Unrecorded	Mill Loch	Dumfries and Galloway	Lowered
North Milton Cairn	NX74NW 23	Unnamed	Dumfries and Galloway	Drained
Doon Bridge	NS40NE 11	Bogton Loch	East Ayrshire	Lowered
King's Hill	NS67NE 2	Antermony Loch	East Dunbartonshire	Lowered
Myot Hill	NS78SE 8	Unnamed	Falkirk	Drained
Colvin's Knowe	NT19SE 5	Loch Gelly	Fife	Lowered
Enclosure/Earthwork	NT19NE 8	Loch Ore	Fife	Drained
Inchyre Motte	NO21NE 11	Loch Lindores	Fife	Lowered
Kinloch Souterrain	NO21SE 12	Loch Rossie	Fife	Drained
Lochore Castle	NT19NE 1	Loch Ore	Fife	Drained
Lochore Golf Course Cairn	NT19NE56	Loch Ore	Fife	Drained
Dunnet Head	ND27NW 3	Sanders Loch	Highland	No Change
Eilean Assynt	NC12NE 1	Loch na Gainmhich	Highland	No Change
Eilean Ghruididh	NG96NE 1	Loch Maree	Highland	No Change
Greystell Castle	ND14SE 4	Loch Rangag	Highland	No Change
Hillhead Broch	ND35SE 14	Unnamed	Highland	Drained
Isle of Moy House	NH73SE 2	Loch Moy	Highland	No Change
Killi Cairn	ND27SW 2	St. John's Loch	Highland	Lowered
Loch Aird	Unrecorded	Loch Aird	Highland	Lowered
Loch Alterwall	ND26SE 6	Loch Alterwall	Highland	Drained
Loch An Eilein Castle	NH80NE 1	Loch an Eilein	Highland	No Change
Loch Durran	ND26SW 33	Loch Durran	Highland	Drained
Loch Lannsaidh	Unrecorded	Loch Lannsaidh	Highland	Dammed
Loch Mor Broch	NC86SE 2	Loch Mor	Highland	Lowered
Lochindorb Castle	NH93NE 1	Lochindorb	Highland	No Change
St. Trostan's Chapel/Priest Hillock	ND06SE 7	Loch Luerary	Highland	Drained
Kings Cairn	NJ46NE 4	Unnamed	Moray	Drained
Loch Spynie crannog	Unrecorded	Loch Spynie	Moray	Drained
Thomshill	NJ25NW 27	Unnamed	Moray	Drained

Figure 7: List of possible crannogs identified. (2)

Name	NMRS ID	Loch	Council	Situation
Urquhart Priory	NJ25SE 6	Unnamed	Moray	Drained
Wester Bauds	NJ35NW 29	Unnamed	Moray	Drained
Ashgrove Loch	NS24SE 2	Ashgrove Loch	North Ayrshire	Lowered
Ardblair Castle	NO14SE 2	Rae Loch	Perth and Kinross	Lowered
Castle Hill	NS36SE 3	Unnamed	Renfrewshire	Drained
Castle Semple Peel Tower	NS35NE 5	Loch Winnoch	Renfrewshire	Lowered
Bradan Castle	NX48NW 1	Loch Bradan	South Ayrshire	Dammed
Carcluie Loch Island	NS31NW 34	Carcluie Loch	South Ayrshire	Lowered
Fergus Loch Monastery	NS31NE 1	Fergus Loch	South Ayrshire	No Change
Loch Doon Castle	NX48SE 1	Loch Doon	South Ayrshire	Dammed
Loch Goosey Island Dwelling	NX28SE 7	Loch Goosey	South Ayrshire	No Change
Lochend Loch	Unrecorded	Lochend Loch	South Ayrshire	Lowered
Martnaham Castle	NS31NE 4	Martnaham Loch	South Ayrshire	Lowered
Duke Murdoch's Castle	NN40SE 2	Loch Ard	Stirling	No Change
Keir Knowe of Arnmore	NS69SW 7	Unnamed	Stirling	Drained
Mugdock Loch	Unrecorded	Mugdock Loch	Stirling	Lowered
Rusky Castle	NN60SW 7	Loch Rusky	Stirling	Dammed
Loch Tower	NT82NW 6	Yetholm Loch	The Scottish Borders	Lowered

Figure 7: List of possible crannogs identified. (3)

Name	NMRS ID	Loch	Council	Situation
Loch A'An Island Dwelling	See Shelley 2009	Loch A'An	Aberdeenshire	No Change
Tonley Wood	NJ61SW 16	Unnamed	Aberdeenshire	Drained
Crannoch-Hill Loch	NJ56NW 21	Crannoch-hill Loch	Moray	Unknown
The Rickle	See Shelley 2011	Linlithgow Loch	West Lothians	No Change
Cormorant Island	See Shelley 2011	Linlithgow Loch	West Lothians	No Change
Linlithgow Loch Island	See Shelley 2011	Linlithgow Loch	West Lothians	No Change
Murder Moss Island	See Hale 2007	Murder Moss	Scottish Borders	Drained
Faldonside Loch	See Hale 2007	Faldonside Loch	Scottish Borders	Lowered
Hoselaw Loch	See Hale 2007	Hoselaw	Scottish Borders	Lowered

Figure 8: Additional possible crannogs from eastern areas not identified by this methodology.

Some caveats with the above list of sites derived from this methodology should be addressed. First, a number of the sites identified here have come from areas of drainage, but owing to the relative accuracy of the RMS, it was not possible to be totally certain that these sites were formerly within a loch. Second, the suggestion that these sites are possible crannogs has been made solely upon their recorded description in the National Monuments Record of Scotland (and elsewhere) and their likely former situation in a loch. Excavation would be the only way to positively identify these sites as crannogs, and as such, the resulting list of possible sites should be considered as targets for future investigations of crannogs in Scotland. However, the majority of these sites have been confidently located within, or possibly within, former lochs and their status as strictly terrestrial site types must be brought into question.

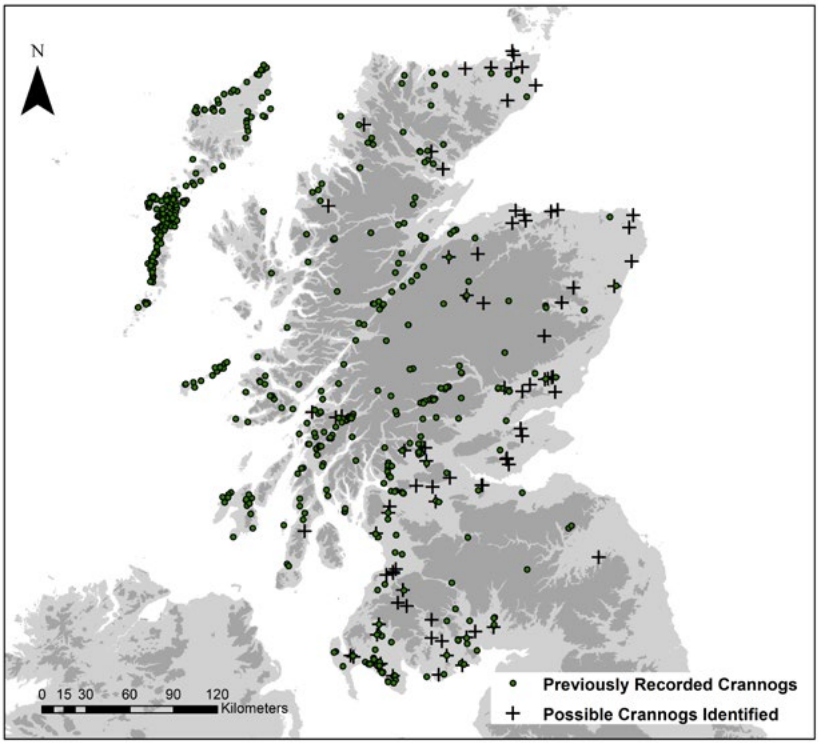

Figure 9: Map showing recorded crannogs (compiled by Cavers 2010 and Lenfert 2012) and possible crannogs listed in Figures 7 and 8.

Discussion

Figures 7 and 8 list 88 possible crannogs, 35 of which come from eastern regions of Scotland – areas that have been neglected by modern investigations of crannogs. These results demonstrate that crannogs do appear in significant, although fewer, numbers in eastern Scotland. Furthermore, the intensity and earlier date of loch drainage in eastern regions of Scotland strongly suggests that many crannogs in the eastern half of Scotland were probably lost through drainage (Stratigos in prep). The idea that crannogs are predominantly a western or Atlantic site type can be questioned in light of the above results. Crannogs have been found where they have been searched for, and the sites recorded here from eastern areas represent only the beginning of an effort to search for crannogs in the eastern half of Scotland. It is important to bear in mind that the majority of the sites on the above lists have only been cursorily investigated (normally 19th century records or Ordnance Survey notes). There are other methodologies which would undoubtedly discover yet more crannogs in both drained and submerged contexts across Scotland.

The results of this research does not turn on its head the distribution of crannogs in Scotland as there remain many more sites in western areas of the country. However, the greater number of sites in western Scotland must be understood alongside the knowledge that these areas have had less Improvement period land-use change in the form of drainage (Stratigos in prep). Furthermore, the history of crannog research and the history of loch drainage have had more impact upon the distribution of crannogs in Scotland than any true distribution of sites in the past. Indeed, the role loch drainage has had on the perceived distribution of crannogs is difficult to understate. A good example of this phenomenon is the drainage of Dowalton Loch in 1863, as prior to its drainage only one island was noted (Stuart 1866: 115-6). It is unlikely that seven crannogs would have been discovered by the landowner and investigated by a number of antiquarians had Dowalton Loch been drained 100 years previously, as most lochs in eastern Scotland were, as at this time the tradition of antiquarianism was not as widespread. In other words, during the 18th and early 19th

centuries local farmers and landowners were less concerned with antiquities found after draining a loch, and any discoveries were either a barrier to the process of improving their land or were seen as a source of raw material – in either instance the archaeological material was removed. So it was earlier (before c. 1850) drainage that served to remove crannogs from the archaeological record in eastern Scotland while later drainage (after c. 1850) helped concentrate crannog investigations (particularly excavation) in southwest Scotland.

Iron Age Settlement Patterns and Future Research Strategies

With 35 additional possible crannogs in eastern regions of Scotland bringing the total number of sites in the region to 50, we must reconsider their place within narratives of later prehistoric settlement patterns, and this must be reflected in future research strategies. The findings of this paper suggest that future research strategies on crannogs must cast a far wider geographic net to take a representative sample of crannogs. Interpretations that have been based upon crannogs' distribution must also be reconsidered. To consider crannogs as characteristically or predominately western or Atlantic comes from an incomplete and biased dataset. The connection between crannogs and their perceived western or Atlantic distribution, along with their usual Iron Age determination, has led some to primarily interpret crannogs within a wider cultural package of Iron Age Atlantic Scotland (Cavers 2010: 168-78; Harding 2004: 108-51; Henderson 2009: 40). While this makes sense for crannogs that date to the Iron Age and are located in the west, the results presented here and the dating evidence suggests that this is an oversimplification. Most radiocarbon dates taken from crannogs have demonstrated Iron Age dates (see Crone 2012), but once again this does not consider potential biases in the data. For instance, all of the excavated examples of crannogs since 1950 (where a significant portion of the radiocarbon dates originate) are from sites with little upstanding medieval or later remains, yet significant and visible medieval and post-medieval occupation is a common feature of crannogs throughout Scotland. The presence of crannogs across Scotland suggests that they were important across the notional cultural boundary of eastern Scotland and Atlantic Scotland as well as through time. Although some interpretations of crannogs have attempted to address the wide geographical and temporal range these sites demonstrate (e.g. Lenfert 2013), convincing interpretations remain hampered by the lack of primary data for most regions of Scotland discussed above.

Interpretations of crannogs must be reconsidered in light of the more ubiquitous nature of crannogs in Scotland that the result of this research proposes. Nearly every recent published work regarding crannogs has called for further intensive excavation to be carried out on crannogs each citing the potential these sites hold (Cavers 2010: 178; Cavers *et al*. 2011: 104; Crone 2012: 164-5; Lenfert 2013: 139-40). However, the results presented here can alter the questions that are to be posed regarding crannog building and occupation in Scotland in the Iron Age and other periods. Sites outwith the southwest should be considered as targets for new programmes of research recognizing that crannogs had a much more even distribution across Scotland than has hitherto been recognized. The case is particularly acute when it comes to excavation, as there is a desperate need to gain a wider geographical sample of excavated crannogs. By re-focusing research on regions outside of the southwest, a much more complete picture of this building tradition can be made. Crannogs have the potential to be centrepieces of our understanding of Iron Age Scotland (along with other periods from which they date). To date, crannogs have rarely been treated as more than addendums to the settlement history of Scotland, but they are certain to hold greater archaeological potential than any other site-type given the preservation of their waterlogged or submerged remains.

Conclusion

This paper should be considered as the beginning of a geographical re-orientation of crannog studies. The idea that crannogs are predominantly western or Atlantic phenomenon can be reconsidered. In this paper an additional 35 possible sites have been proposed which add to the existing number of crannogs

in eastern Scotland. This has been achieved through desk-based analysis, and the application of different methodologies and fieldwork will almost certainly discover further sites across Scotland. Loch drainage has impacted our understanding of the distribution of crannogs and has undoubtedly influenced research strategies. Recognition of this fact moving forward will serve future crannog research well, and will contribute greatly to crannogs taking their rightful place in the narratives of many periods in Scotland, particularly the Iron Age.

Acknowledgements

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New perspectives on British territorial oppida: the examination of Iron Age landscapes in time and space

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Introduction

This article examines the Late Iron Age settlements of south-east Britain described as oppida, which were initially examined almost fifty years ago and have recently been the subject of renewed research (e.g. Moore 2012; Pitts 2010; Rogers 2008). The term oppida has a long history, first referenced in Julius Caesar's Gallic Wars (Handford 1951) and translated from Latin to mean 'town'. This article examines the history of archaeological research into oppida in Britain, providing an analysis of the pitfalls of past interpretation and, specifically through the study of territorial oppida, the most successful avenues of exploration. In light of these new methods and theories, a new perspective on how we examine territorial oppida is put forward, illustrated through a supporting case study. This article forms an initial statement of the author's doctoral research into territorial oppida in south-east Britain.

In archaeological research the examination of oppida initially attempted to equate defended sites within France, including those at Bibracte (Bulliot 1899; Déchelette 1904) and Alesia (Napoléon III 1861), to historic events and oppida mentioned in Caesar's text (Collis 1984: 6). However, based upon a broad definition of evidence for defences and permanent Iron Age occupation (Collis 1984: 6), the term oppida expanded to include many Late La Tène defended Gallic settlements. Later, settlements outside Gaul were also defined as oppida including, in Germany the settlement of Manching and, in the Czech Republic Staré Hradisko and Zavist (Collis 1984: 6) (Figure 1). This attempt to classify oppida under a single broad definition was problematic. As argued for the study of Iron Age hill-forts (Champion 1994; Gwilt and Haselgrove 1997: 1), this was due partially to the regional and interregional differentiation between these sites visible in the enclosing defences, the physical internal structure of these settlements and their geographic location.

In Britain the term oppida was equally vague. In the 1960s/70s these sites were considered, due to their size and later prehistoric date, to be the top of a settlement hierarchy (Cunliffe 1976a; Haselgrove *et al.* 2001: 15). However, the differences between British oppida and European examples led Cunliffe (1976b) to create sub-divisions to provide greater clarification for these sites, including 'enclosed oppida', 'undefended oppida', and 'territorial oppida' (Cunliffe 1976a: 354–5; 1976b: 135–6). Despite this sub-division, scholars examining British oppida in the 1970s/80s, continued to make comparisons to those on the continent, leading to their definition along continental lines. This is evident in the assumed urban character of British oppida, illustrated by titles of contemporary texts such as 'Oppida: the Beginnings of Urbanisation in Barbarian Europe' (Cunliffe and Rowley 1976) and 'Oppida: earliest towns north of the Alps' (Collis 1984). Rogers (2012: 645) has argued that these initial interpretations of oppida have had the effect of 'simplifying our understanding of these sites' in terms of their location, the activity uncovered within them and the way in which they were experienced.

In Britain, a growing dissatisfaction with processual approaches to the Iron Age (e.g. Hodson 1964; Cunliffe 1975) led to a series of critiques in the 80s/90s of the assumptions placed on the period

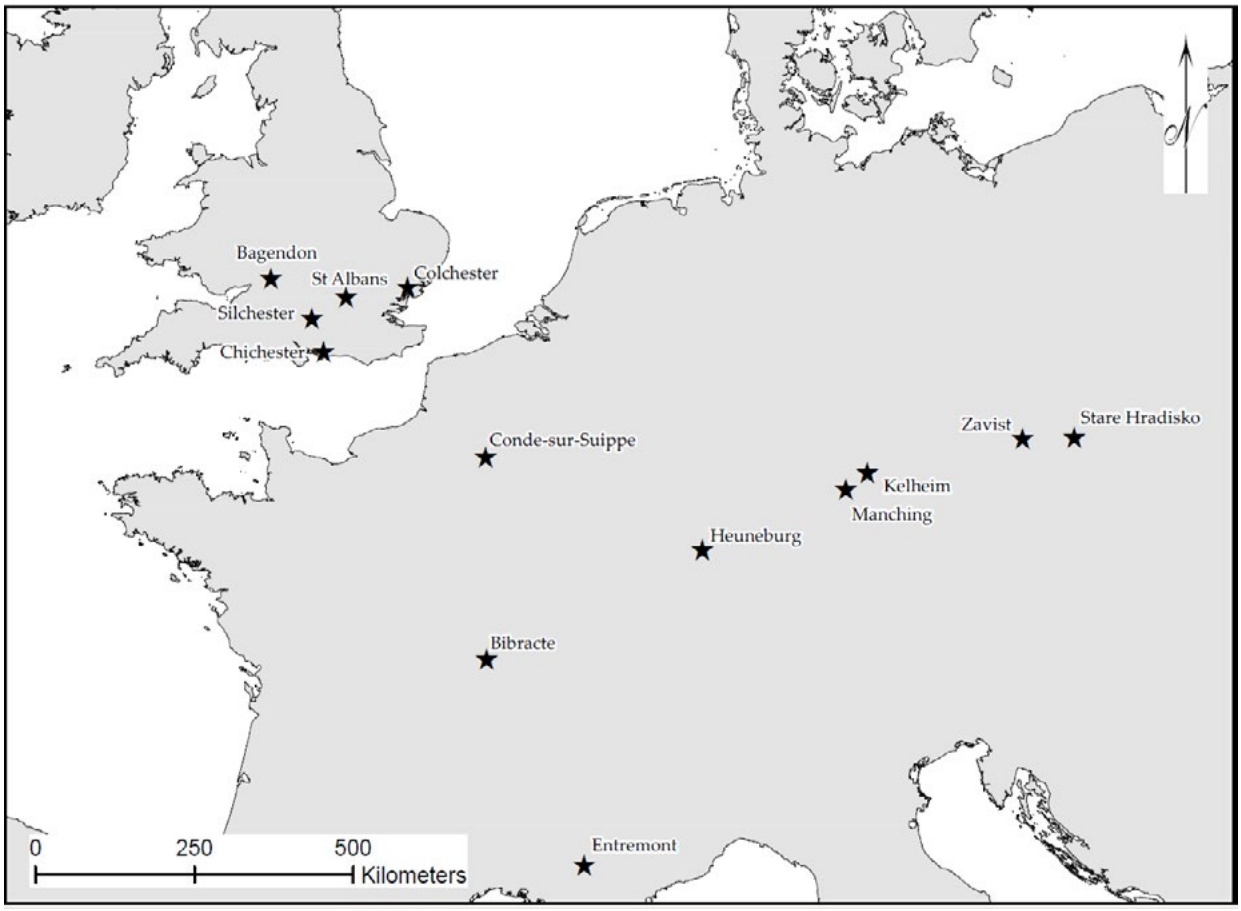

Figure 1: Oppida in NW Europe: sites mentioned in text

(Hill 1989) e.g. the existence of a single 'Celtic' identity (Fitzpatrick 1996; James 1999; Megaw and Megaw 1998; Collis 2003). This included a critique of previous interpretations of oppida, leading Woolf (1993: 223) to question whether the regional and interregional differences between these sites meant that the term 'oppida' as a single definition was useful in an archaeological context. Woolf (1993: 231) also challenged the presumption that these sites demonstrate traditional urban characteristics (e.g. Childe 1950), suggesting if they were 'urban' in character they represented an individual form of urbanism distinct to Iron Age Europe. Haselgrove (1995: 86) also argued that the emphasis placed on oppida, due to the presence of large earthwork systems, evidence for contact with the continent (e.g. imported goods) and the early adoption of coinage, was to the detriment of other Late Iron age complexes who were equally associated with 'high-ranking members of society' but lacked surrounding earthworks. Furthermore, the wider post-processual debate began to reject the role of a definitive Iron Age settlement hierarchy dominated by oppida (Haselgrove 1989: 11). Originating from the rejection of hillforts as purely defensive (Bowden and McOmish 1987), further critiques challenged whether these sites could be interpreted only as centres of production/exchange or elite residences (Hill 1995a), while detailed research failed to identify a single chronology (Hill 1995c: 68) or presence of hillforts in all Iron Age societies (Hill 1995a). This differentiation suggested that hillforts were a regionally influenced phenomenon (Hill 1995a) that did not directly encourage the appearance of oppida, nor indicate that oppida represented the final development in settlement form prior to AD 43.

Territorial Oppida

In Britain, renewed research into oppida in the 21st century focused predominantly on territorial oppida. This is due to a long history of archaeological research, but also the continued definition of some territorial oppida as centres of 'major social and political importance' because of historical and numismatic evidence (Haselgrove 2000: 105). Territorial oppida have been characterised as large-scale settlements, covering vast areas of landscape (Figure 2), defined by discontinuous linear earthworks stretching up to 20 to 30 km in length (Cunliffe 1976b; Haselgrove 2000). Territorial oppida have also been described as 'polyfocal' settlements; defined by scattered elite and lower status residential compounds separated by agricultural areas (fields systems) and interspersed by discrete designated zones of varying function (agriculture, ritual activity, burial, metal working, coin production) (Haselgrove 1989: 11; 1995: 86; 2000: 105; Haselgrove and Millett 1997: 286). The definition of these sites as 'polyfocal' has been influenced by the sheer size of territorial oppida and the lack of knowledge of the site interior (Haselgrove 2000: 106).

Recent research has illustrated the diversity of these sites, both in function and geographic location (e.g. Bryant 2007), which is illustrated at Silchester where, in contrast to the general definition (see above), the oppidum was smaller in size and highly structured around a rectilinear street grid. This site has been interpreted as a "planted settlement" of migrants from Gaul (Fulford *et al.* 2000: 563), suggested by limited evidence for pre-oppidum occupation and material/biological evidence suggesting strong links to the continent (Lodwick 2013).

The research into territorial oppida has highlighted the benefits of analysing these sites in the landscape context in which they were constituted. More sophisticated interpretations have been developed as to why territorial oppida were founded in specific locations, why these locations were important and how oppida functioned, both practically and socially. For example, Millett (1990: 25–6) has suggested that some territorial oppida may have been founded in unoccupied areas that provided neutral locations for the periodic meetings of social groups. This interpretation has been argued for the St Albans oppidum, due to its position within a marshy river valley and at the convergence of distinct landscape zones (Haselgrove and Millett 1997: 284–5; Haselgrove 2000: 106). Later, due to the ritual/communal significance of this

Name	Size (hectares)	Foundation date (After Pitts 2010)	Interpretation	Activity in Roman period?	References
Colchester, Essex (Camulodunum)	10,000	c.25 BC.	Complex site with multiple foci set within a highly ritual landscape	Legionary fortress and later town (*colonia)*	(Hawkes & Crummy 1995; Rogers 2008; Willis 2007)
St Albans, Hertfordshire (Verlamion)	700	Pre c. AD 20.	Originated as meeting place for tribal groups – evidence for high status burials and settlement	Roman town (*municipium*)	(Hunn 1992; Haselgrove & Millett 1997; Niblett & Thompson 2005)
Silchester, Hampshire	32.5	c.25 BC	Highly structured settlement – planned migrant settlement	Roman town (*civitas capital*)	(Fulford *et al.* 2000; Lodwick 2013)
Bagendon, Gloucestershire	200	c.AD 1–20	Elite complex spread over a wide area in the Cotswold/ Thames Valley	Continuation of occupation– 'heyday of the site'	(Clifford 1961; Trow *et al.* 2009; Moore 2012; Moore 2014)
Chichester, West Sussex	15,000	Pre c.AD 20?	Oppidum with nucleated core at Selsey	Roman town (*civitas capital*)	(Bradley 1969; Davenport 2003)
Stanwick, North Yorkshire	300	c.100 BC.	Elite settlement with construction of monumental timber structures	Continuation of occupation– fell out of use after AD 79	(Haselgrove *et al.* 1990; Haselgrove 2000)

Figure 2: Selected territorial oppida in Britain

location, elite residences were founded that provided the origins for the oppidum (Haselgrove and Millett 1997: 285). A similar topographic position, on the interface between two distinct landscapes, is also present on a number of other territorial oppida including Bagendon and Stanwick (Haselgrove 2000: 106; Moore 2012: 405).

Research at Colchester has also suggested that the oppidum may have been founded in relation to 'watery contexts', which gave this location a religious meaning during the Iron Age (Willis 2007; Rogers 2008). In particular, it has been interpreted that ritual activities were undertaken at the metal-working site at Sheepen as it was located at a culturally meaningful boundary, represented by the interface between fresh and salt water (Willis 2007: 121). Rogers (2008: 45) argued that the Colchester oppidum was therefore situated within a 'meaning-laden and multi-focal landscape'. The position of a number of other territorial oppida within river valleys/marshy areas, including at St Albans and Stanwick, may reflect the wider importance of 'watery contexts' and ritual centres in the development of these sites (Haselgrove 2000: 105–6).

The importance of ritual significance and landscape context has assisted in understanding territorial oppida in different aspects, in particular the comparison of these sites to those outside of Britain, which have expanded our understanding of how they formed and for what function they served. For example, J.D. Hill (1995c: 72) and others have drawn parallels between territorial oppida and the so-called 'Royal' sites of the Irish Midlands, including Navan, Co. Armagh, Dun Ailinne, Co. Kildare and Tara, Co. Meath, which have been interpreted as ceremonial meeting places, enclosed by large earthwork boundaries and containing evidence for metal deposition and ritual feasting. For example, Moore (2012: 413) claimed the 'Royal' Irish sites share characteristics to the Bagendon oppidum, in the way the surrounding earthworks funnelled the movement of people in particular directions and to ritual focal points, creating 'theatrical and ritualized landscapes of movement'.

A number of sites on the continent have also been directly compared to British territorial oppida, including Manching and Kelheim, Germany, both located in low lying areas, close to river systems and defined by large scale earthworks systems. Similar landscape contexts have also been argued for sites in France, including Villenuve St Germain, Picardy and Bibracte, Burgundy (Rogers 2012: 648). Haselgrove (2007: 511) suggested that sites such as Conde-sur-Suippe, Picardy, which have previously been examined as a single element, normally a fortified settlement on a high topographic position, are actually 'conceived as several elements dispersed over a larger territory, of which, a permanent and/or fortified settlement was only one'. Fieldwork on the continent has uncovered similar sites including Entremont, Provence, where geophysical survey has revealed a large area of previously unrecorded settlement (Armit *et al.* 2012) and at Heunenburg, Germany, although of an earlier date, where an area of settlement 100 hectares in size was found surrounding the hilltop fortification (Krausse and Fernández-Götz 2012: 31). While these sites may not be directly comparable to British territorial oppida they do illustrate that our understanding of these settlements should expand beyond single hilltop sites into the wider landscape and that the landscape as a concept was of particular importance to the people of the Iron Age when conceiving of these settlements.

New Perspectives

The recent analyses of a number of territorial oppida in Britain (i.e. Silchester, Bagendon) have benefited by further archaeological investigation, including geophysical survey and keyhole excavation. Intensive research-based fieldwork is not plausible for all oppida sites, due to the location of modern towns at the core of these settlements (e.g. Colchester, Chichester), however, it has been illustrated on the continent that development-led archaeological fieldwork can greatly aid our understanding of oppida and how they developed over time (e.g. Manching, Germany - Wendling and Winger 2014). This research examines British territorial oppida by utilising the spatial and contextual data present on local Historic Environment Records (HERs), incorporating the results of published and unpublished development-led investigations

as well as well-known archaeological sites. This enables us, from a landscape perspective, to 'fill in the gaps' for oppida, examining in detail the often overlooked areas in-between well-known Late Iron Age sites. Were territorial oppida 'poly-focal' settlements or intensively occupied areas of occupation, as illustrated by sites on the continent (e.g. Entremont, Provence)?

This information bolsters the data-set for territorial oppida, however, we must continue to examine these settlements in new ways. Despite criticism of oppida in the 1990s (see above), there is still some way to go in order to fully understand and appreciate how these settlements were structured, particularly in a social sense. For example, territorial oppida are usually assumed to represent centres for trade and production controlled by elite patrons organised around a hierarchical social structure. This forms part of a wider debate into how society was organised in the Iron Age (e.g. hierarchies vs heterarchies) with recent analysis exploring alternatives to hierarchical structures (e.g. Armit 2007; Cripps 2007; Giles 2007; Hill 2006; Moore 2007; Sharples 2007; Wigley 2007). While territorial oppida may have been organised under a 'client king' (e.g. Creighton 2000; 2006), this interpretation must be substantiated through a detailed examination of the social structure from the 'bottom-up'. By this I mean attempting to understand how people articulated themselves as social entities, how the inter-relationships between people formed social groups and how these groups contributed to the overall social structure of the oppida.

This research explores a multi-scalar analysis of territorial oppida, by investigating society in territorial oppida on multiple levels (people, groups, regions), through the examination of evidence present on multiple scales (finds, sites, landscapes). This is established through the interweaving of two post-processual theoretical frameworks; Identity and Landscape. The concept of identity has been defined as representing both the "similarity and difference in the examination of the relationship between people and things" (Jenkins 2004: 3–4). This definition is useful for examining patterns within archaeological evidence; however, it must be framed within a structuralist approach (Giddens 1984) that considers both agency (the actions of people) and structure (representing the wider physical and social world) as a single entity. While structure has often been overlooked in favour of the understanding of agency (Gardner 2011: 72–5), the identification and consideration of both allows for the exploration of people in relation to larger social groups, or institutions (Jenkins 2004: 24–5), and permits us to explore different social scales and how they interacted. The concept of 'landscapes', an idea that is constituted within the periods that they were inhabited, is important to frame this understanding of personal and group social dynamics. The 'landscape-scale' of territorial oppida has in the past made the examination of landscapes an obvious theoretical approach (e.g. Moore 2012; Rogers 2008), however, it can also allow us to frame our understanding of what people 'did' in oppida and explore its implications at a wider social scale. The consideration of landscapes as 'lived space', transformed by the actions of humans (Thomas 1993: 172; Thomas 1996: 83), has moved our understanding of landscapes away from approaches that examined 'sites' within a 'passive backdrop', and instead examines archaeological remains across a region within a wider framework of past human activity (Ashmore and Knapp 1999: 2; Ingold 1993: 158). This allows for a person-centred approach, i.e. one that explores experiential interpretations of landscapes, to best understand how people in the Iron Age perceived the landscape where territorial oppida were founded and operated.

Case Study

With the above ideas in mind, an examination of part of the territorial oppidum at Camulodunum (Colchester) illustrates how this multi-scale analysis operates and how, through the investigation of ritual action, identity is articulated on multiple social scales. Central to this part of the Late Iron Age landscape is the ritual and funerary site at Stanway (Crummy *et al.* 2007). Preceded by a Middle Iron Age farmstead (Enclosure 2), two enclosures (1 and 3), utilised for ritual and funerary purposes were constructed at Stanway between the mid-1st century BC and AD 43 (Figure 3).

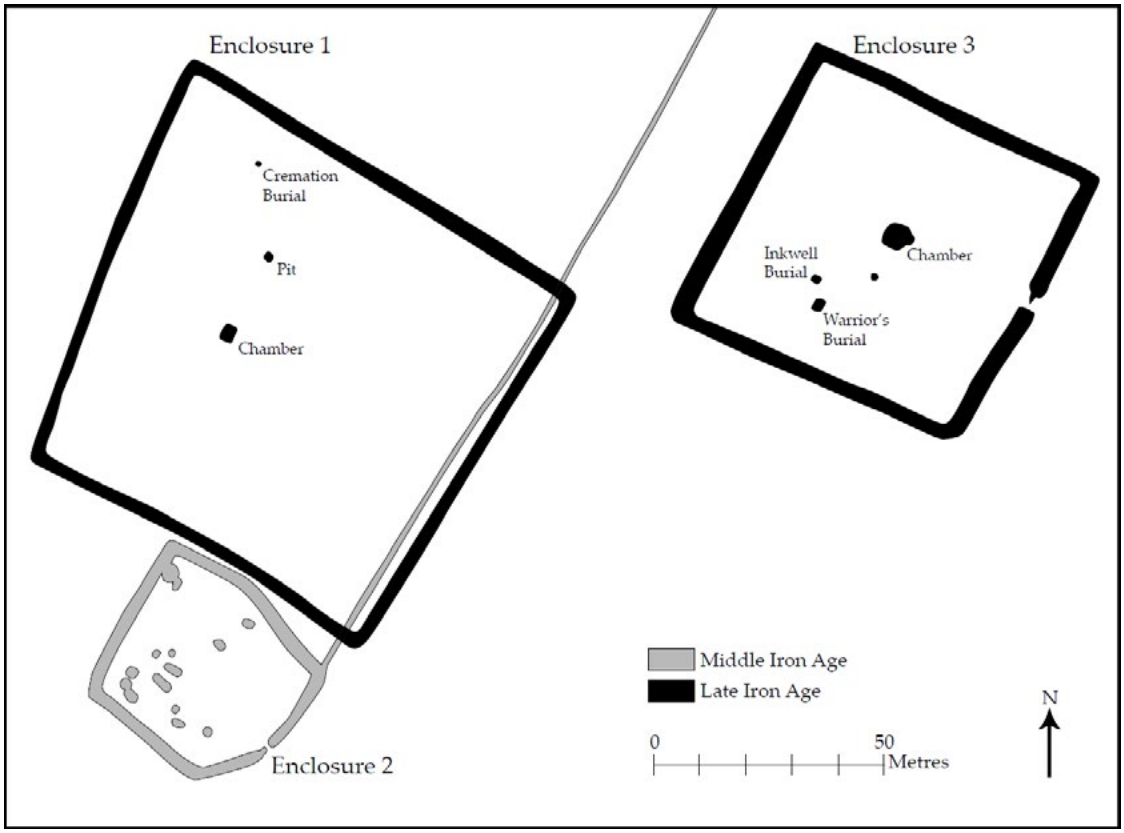

Figure 3: Stanway, Colchester, Essex (re-drawn from Crummy et al. 2007)

People

The evidence for burial at Stanway indicates that cremation was a predominant burial rite and suggests that belief systems were shared by Iron Age people in the territorial oppidum. However, the variability of burial types (Figure 4) suggests specific attitudes to how burials were undertaken and indicates that some burial rites, most likely the internment of remains, were the responsibility of close familial groups. Feasting and drinking were a major component of the rituals undertaken at Stanway, evidenced by broken pottery sherds in both the burials themselves and the surrounding enclosure ditches (Crummy *et al.* 2007: 72). This was likely related to the changing habits of consumption present in the Late Iron Age (i.e. Hill 2002) and was associated with particular rituals associated with the internment of the burials themselves.

The inclusion of a diverse range of grave goods within these burials also illustrates the personal identity of individuals in death, possibly to reflect wealth and status of either the deceased or, more likely, those who were responsible for the burial (Parker-Pearson 2003: 78–9). We should also appreciate the complexities of the meaning behind these goods, which reflect specific motives and individual approaches to burial rites and may reflect varying rules of inheritance and gift exchange (Parker-Pearson 2003: 94). For example the inclusion of imported material as grave goods has previously been interpreted as "Romanization before conquest" (Haselgrove 1984), i.e. the adoption of Roman styles prior to AD 43; however, Willis (1994: 145) argued that these products may not have been considered 'foreign' at all, due to long established links between Britain and Gaul, or that, as a separation from cultural norms, its inclusion could reflect a highly subversive attitude to established social relations (Willis 1994: 144). The inclusion of a range of grave goods reflects the diverse personal identities involved in these burials, revealing both the dead themselves and those who buried them.

Burial name	Form	Grave goods	Comments	Date	Reference
Enclosure 1 Chamber	Burial chamber measuring 3.3m x 2.5m x 1.1m, Lined with wooden planks containing unurned cremated human remains	Pottery, animal bone, copper alloy objects	Contained deliberately broken pottery	Mid 1st century BC	Crummy et al 2007, p101
Enclosure 1 Cremation burial	Urned cremation of adult female	Jar (cremation vessel), Cloth bag containing Verdigus (cosmetics)	Pottery local in origin	Mid 1st century BC	Crummy et al 2007, p167
Pit - Enclosure 1	Pit containing broken funerary goods, small amount of cremated bone	Pottery, metal alloy strips, part of a wooden object, metal earrings		Mid 1st century BC	Crummy et al 2007, p162
Enclosure 3 Chamber	Burial chamber measuring 5.5m x 5m x 1.2m, Lined with wooden planks, posts to support chamber roof, containing cremated human remains	Pottery (23 vessels), possible furniture, copper alloy objects	Pottery imported and of a 'specialised function' - from Gaul	35-43 AD	Crummy et al 2007, p104
Pit - Enclosure 3	Pit containing barrel - filled with charcoal and ash, no bone	Barrel	Possible pyre debris	35-43 AD	Crummy et al 2007, p157

Figure 4: Stanway - Burials/features (After Crummy et al. 2007)

Site name	Date	Size	Shape	Area (square metres)	Person hours (see table 4)
Enclosure 1	Late Iron Age	98m x 92m	Rectangular	7985	5677
Enclosure 2	Middle Iron Age	40m 35m	Sub-square	1440	1840
Enclosure 3	Late Iron Age (later than enclosure 1)	74m x 70m	Sqaure	2999	3934

Figure 5: Stanway enclosures (After Crummy et al. 2007)

Groups

Returning to the shared pattern of rites evident within these burials (i.e. act of cremation; internment in burial; placement of goods), these trends imply agreed social conventions of burial on a community level (Parker-Pearson 2003: 194), formalised through the construction and maintenance of specific places of internment; the funerary enclosures. The act of constructing this space would have also required co-operation on a community scale, necessitating for Enclosure 1 (based on labour estimation – see Figure 6) the efforts of approximately 20 people working ten hour days for 28 days. As suggested by Wigley (2007: 185) the sharing of labour in the construction of enclosures at the junction of important events (i.e. feasting, marriages, rites of passage) may have aided in the affirmation or reaffirmation of community ties during this period.

As suggested above, feasting and drinking were major components in rituals associated with internment at Stanway, however, the presence of the broken pottery in the surrounding enclosure ditches also suggests that rituals associated with feasting were articulated on a community level. These communal events were likely associated with repeated commemorative events, potentially viewed as a central area of congregation or ceremonial space (i.e. Newman 2007), as well as burial. This is reinforced by the features within these enclosures that did not contain burials, but were comparable in the materials and manner in which goods were deposited, suggesting ritual deposition (i.e. Hill 1995b). The deposition of goods in these features may represent further evidence for repeated or commemorative ritual action illustrating the importance of the site.

L x Section / CV = D
L = Length of ditch
Section = Area of the section of the ditch
CV = Volume of earth (chalk) excavated by one person in one hour in cubic metres
D = Person hours

Figure 6: Equation for labour estimation (after Ashbee and Cornwall 1961; Brown 1991: 12)

The conspicuous location of these enclosures (Figure 2) in relation to the likely visible abandoned Middle Iron Age farmstead (Crummy *et al.* 2007: 69), illustrates the importance of agricultural cycle to the social structure of the territorial oppidum (Williams 2003) and perhaps suggest the motives behind collective intent to commemorate this location through ritual and burial activities.

Regions

On a regional scale the Late Iron Age enclosures were positioned to respect the farmstead and trackway established in the Middle Iron Age (Crummy *et al.* 2007: 69) as a droveway for moving animals (Figure 3) and perhaps retained in the Late Iron Age and transformed to a route for ceremonial or ritual procession (e.g. Newman 2007). The orientation of the north-south trackway in relation to other farmsteads in the Middle Iron Age (e.g. Abbotstone, Fiveways Fruit Farm) illustrates the influence of pre-existing routines/rites in the Late Iron Age and the special regard given to the agricultural system (Bradley 2005: 168–9).

The notion of movement across the territorial oppidum is understood by the position of the site at Stanway in relation to the Late Iron Age linear earthwork systems (Hawkes and Crummy 1995). While the construction

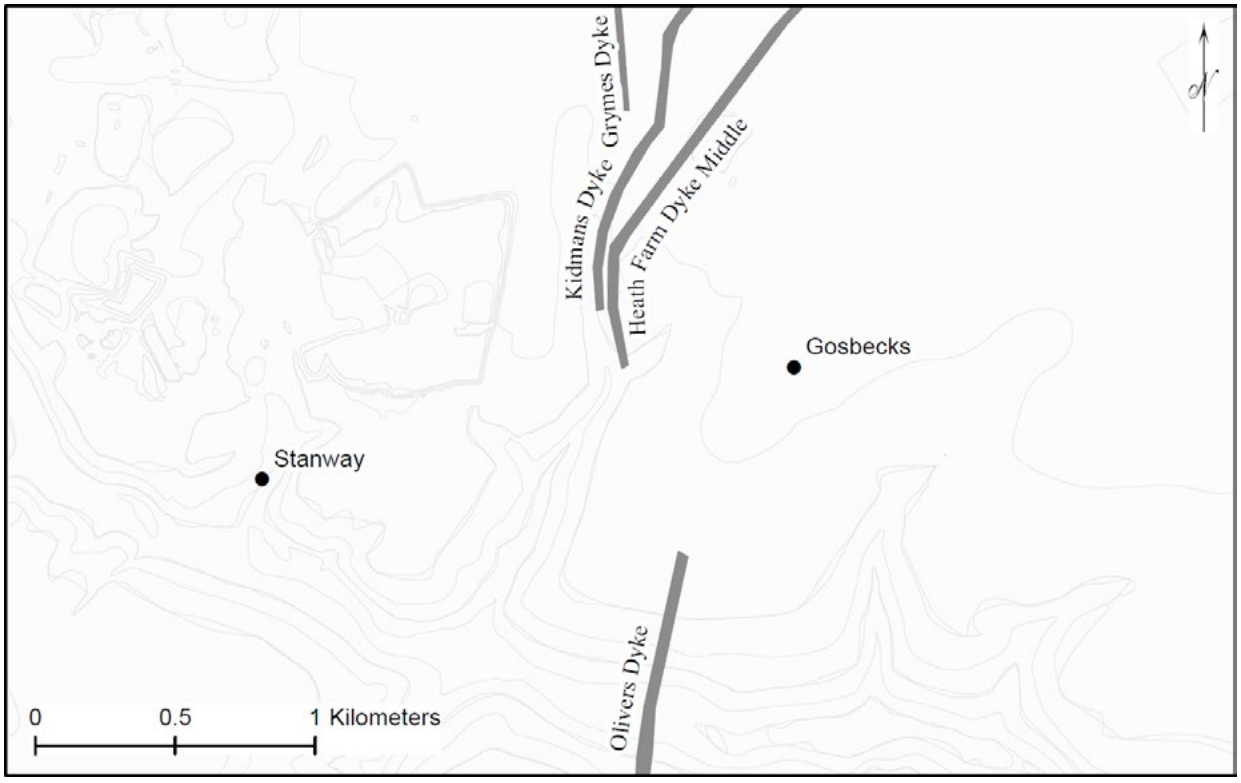

Figure 7: 'Regions': Stanway in the landscape of the territorial oppidum

of Kidman's Dyke purposefully excluded the site at Stanway from the activities within the linear earthwork system, a single entrance did allow movement between Stanway and the site at Gosbecks, another key ritual enclosure in the Late Iron Age (Haselgrove 2000: 106). The implicit opening in the earthwork reinforces this important route between the two sites (Figure 7) and has the effect of directing people towards focal points and creating elaborate ways of moving and experiencing the landscape (Moore 2012: 410).

Conclusion

This paper illustrates that while previous research into oppida has been problematic, renewed research into British territorial oppida has demonstrated the potential for new theoretical techniques and methods to understand these settlements and their role in the Late Iron Age. The case study has illustrated the benefits of examining territorial oppida through a multi-scale analysis, which reflects both the archaeological evidence and the social structure of these sites, and through a break from traditional understandings enables a fuller understanding of these settlements. Further investigation and analysis of territorial oppida, especially in light of an ever growing archaeological dataset produced by commercial archaeology, may yet challenge other pre-conceived interpretations of these settlements.

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High Voltage Meets Research: The E.ON 2002 Excavations in the Oppidum of Manching

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The oppidum of Manching (Germany, Upper Bavaria) is one of the prime examples for large fortified settlements in Iron Age Europe. The last 60 years of research created a huge amount of insights to all types of finds, building structures and knowledge based on natural sciences. Presently, all this knowledge is published in 20 monographs of the Manching-series and plenty articles (for the latest summary of relevant new issues, see Wendling 2013).

Besides the Neolithic, Bronze Age and Hallstatt occupation and the two La Tène (LT) B and LT C1 cemeteries at Manching, the early settlement can be traced to several LT B2/C1 structures at the central part of the later oppidum. After a systematic expansion at the end of LT C1, a regular, planned open settlement with all features of a city was in existence. About 140–120 BC, the settlement was fortified with a surrounding wall (*Murus Gallicus*), which encircled an area of c. 380 ha. Among the various types of houses that have been assigned functions, such as workshops, stables, granaries and temples, plenty of finds have been unearthed. While the first of them helped Paul Reinecke to characterize his periods LT C and LT D (Reinecke 1902), outstanding finds like the hoard of 483 gold coins (Ziegaus 2013), the "golden tree" (Maier 1990, 2000) and parts of an iron horse statue (Krämer 1989) attracted international interest.

As with practically all excavations in the area of the oppidum of Manching, the work carried out in 2002 occurred as a result of development work. Building plans by the energy company E.ON led to excavations carried out in central parts of the La Tène period settlement. These are known as E.ON I–V (Figure 1).

E.ON I

The 0.4 ha excavated as part of the E.ON I project have already been discussed elsewhere in combination with further research that was carried out in 2002 (Hüssen and Leicht 2003). E.ON I-V were analysed in advance of the construction of a transformer station, as well as the associated cable trenches and road extensions. All work was financed by E.ON Netz GmbH. Dr M. Leicht and the technician M. A. Wiedamann of the Ingolstadt branch of the Roman-Germanic Commission of the German Archaeological Institute directed the excavations. As mentioned in the preliminary report, there was no trace of any dense settlement patterns in the excavated area. This was surprising, given its position only 200 m away from the central part of the site. Concentrations of post-holes, pits and ditches that had been expected throughout the area were only found in the southern part of the site that was excavated to make way for an access road (Figure 2).

The preliminary report suggests two possible causes for the lack of archaeological features in the northern part of the excavated area. As observed in other parts of the oppidum, some parts of the oppidum were kept clear of structures in order to serve as access ways or streets. In view of the close proximity to the northern runway of the Manching airfield, it is equally possible that large parts of the archaeological record had already been destroyed. This latter interpretation appears to be supported by the fact that the excavations carried out as part of E.ON II, located further south at the very centre of the oppidum and closely to the runway, identified no archaeological features whatsoever. As mentioned below this is contrary to the wealth of structures found in the nearby *Zentralfläche* and can be ascribed to the ground levelling in course of the building of the airfield in the 1930s.

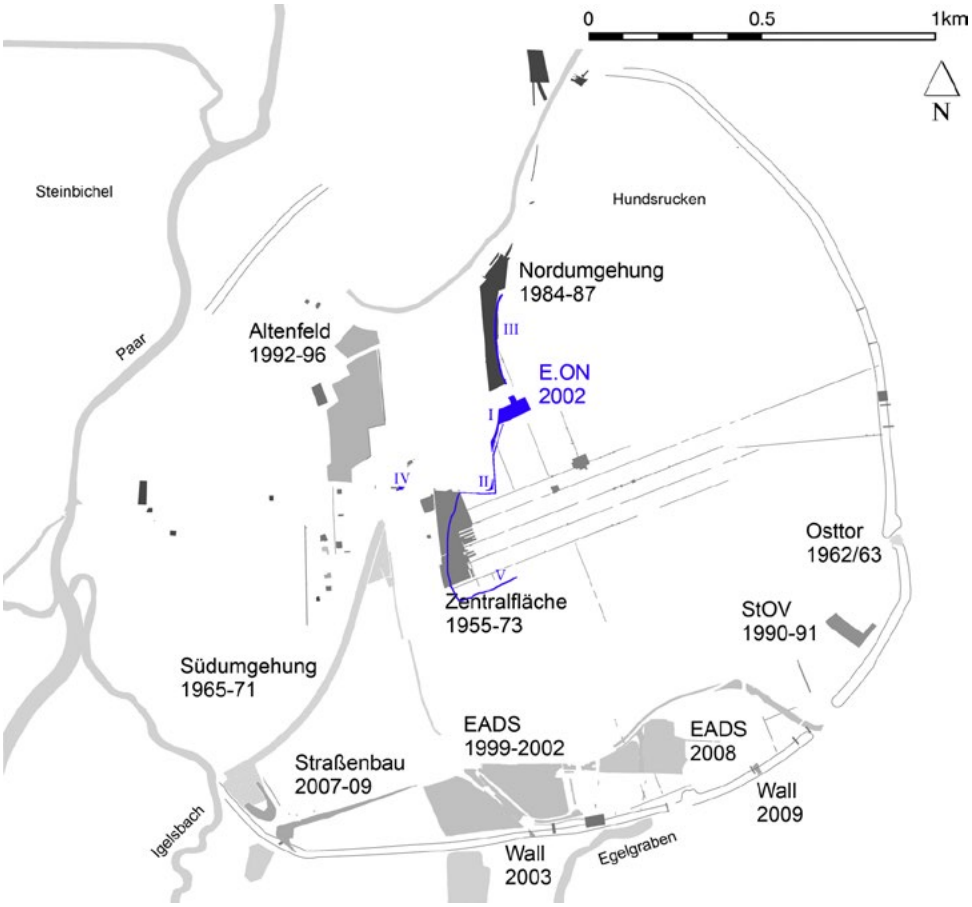

Figure 1: Manching. Schematic plan of the excavated areas including the E.ON-trenches marked in blue and named with I–V .

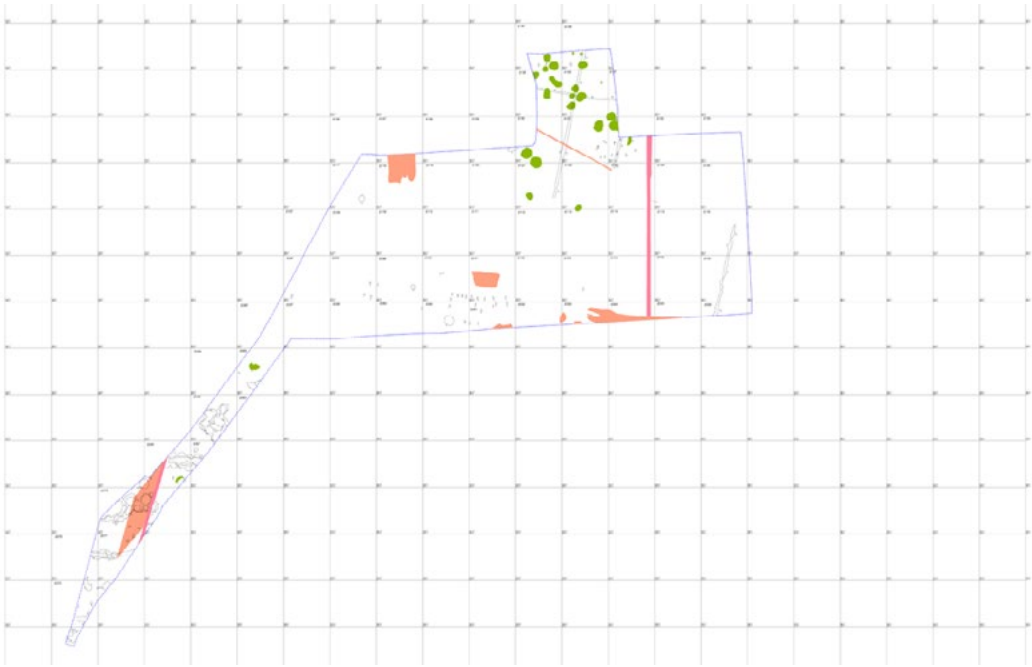

Figure 2: Manching, Plan of the structures in trench E.ON-I. Disturbances marked in orange, trial tranches from 1957 in pink, tree windthrows in green. Sections are 10 x 10 m.

If the area of E.ON I also was levelled on a large scale as part of the construction work for the airbase, this would mainly have affected post-holes, since wells, pits or ditches would most likely have been preserved at least in their lowest parts.

However, in view of the traces of shallow ditches in trenches 2096/2106/2116, 2123/2132, 2121/2131/2136/2139 and 2135/2136/2137 large-scale levelling measures appear unlikely. All of these ditches are only a few decimetres wide and could only be identified in section. They rarely reach more than 10cm in depth. As in other parts of the settlement, these ditches were punctuated by post-like depressions that reach beyond the bottom of the ditch. Throughout the site, features such as these are void of finds and can therefore not be dated securely. Similar ditches in other areas, however, are clearly orientated along La Tène period features and therefore date to the Iron Age. As all of these ditches are generally cut by modern features, an Iron Age date is supposed.

A further argument against any earlier large-scale destruction of the archaeological record is supported by the existence of post-holes in the northern part of the excavated area. Particular concentrations occurred in trenches 2098/2099, 2090/2091/2100/2101 and 2131/2132. It seems highly improbable that relatively shallow post-holes should have survived, when the much deeper pits and wells (which occur even in loosely settled areas) would have been destroyed by later levelling measures. As such, it is safe to assume that the excavations document a relatively fair reflection of the original archaeological record.

The only structure that can be reconstructed with certainty on the basis of posthole patterning is an irregular rectangular four-posted building. The structure measures 2 by 3.5m, has parallel sides and is orientated NNW. This type of building was also identified in an excavation area located only a few metres further north known as the *Nordumgehung* (Köhler 1992, 36 and Figure 19).

Several features allow for the reconstruction of another building only a few metres further east of the first ground plan. The suggested reconstruction is based on the maximum of possibly associated postholes, which excludes posts 3 and 4 in trenches 2091 and 2101. The two southern corner posts were situated

Figure 3: Manching, Plan of the structures in trench E.ON-I with ground-plans of buildings and the assumed course of the street running W-E (both in red); modern structures are marked in light grey.

in a later pit or disturbance but were excavated without documentation. Postholes 2091/1, 2091/2 and 2101/2 appear to form a line and have therefore been reconstructed as an interior wall. The width of the building (at 5.5m) and the possible interior wall, are reminiscent of a related type of structure that was first identified in the *Südumgehung* area (Winger 2015: 23-24). Yet, this is characterised by two further posts in one of the two rooms. The structures in the *Südumgehung* are generally around 16m long. While this is possible for the building in question, it is by no means certain.

Reconstructing the third concentration of postholes is significantly more difficult. At first glance, they appear to occur in pairs. If all postholes in the relevant trenches are included (accepting that posts 2132/6, /7 and /8 were probably part of the shallow ditch 1), then it is possible to tentatively reconstruct two slightly staggered rectangular structures. If this reconstruction is correct, then the two similar structures cannot have been contemporary, which suggests long-term use of the investigated area.

Dating

Traditionally, it was assumed that E.ON I was settled last during the expansion of the site in LT C1b (Figure 4). This assumption was based on a mapping project for settlement suitability conducted with trial trenching. Krämer and Schubert (1970: suppl. 5) identify the zone where E.ON 1 is located as the most suitable for settling and suggest that it was densely populated from the beginning of the settlement. Somewhat surprisingly, though, the material from the excavations contains no mid-La Tène period fragments of glass bracelets, while the earliest coins date to LT D1. The ratio of mid-La Tène brooches to those of the late-La Tène is roughly 1:3, suggesting that the area was only settled in a later period. In comparison, the excavations in the *Südumgehung* produced 68 mid-La Tène and 89 late-La Tène brooches, a relationship of 3:4 (Lorenz 2004: 73). Importantly, the southern part of the *Südumgehung* was settled only in LT D and, as in E.ON 1, produced only a small fraction of the total number of brooches recovered.

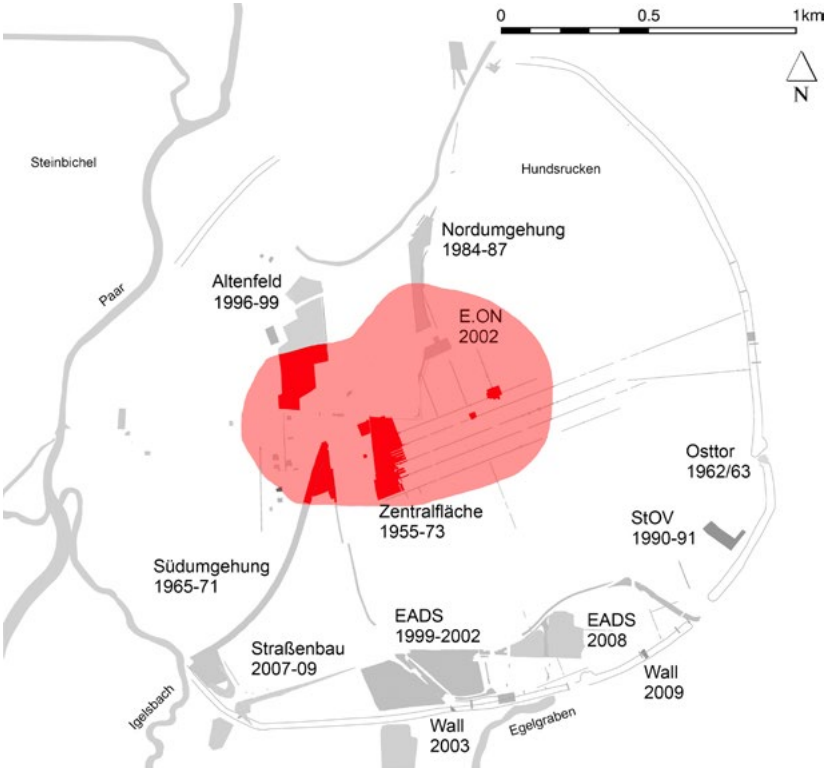

Figure 4: Manching, Schematic plan of the excavated areas and settled sectors at the end of LT C1 (red) and LT D1 (highlighted in light red).

The latest finds include two brooches that have already been mentioned in the preliminary report (Hüssen and Leicht 2003: 60). One is an iron brooch of the Gebhard 33 group (Gebhard 1991), a version of Almgren Type 65. The second is not a further Almgren 65 (as it is falsely referred to in the preliminary report), but a Gebhard 32 brooch (Gebhard 1991: No. 884). It should be noted, however, that the metal finds have not yet been restored, even though ten years have passed since excavation. As such, any analysis of this material must remain provisional.

Despite the limited mid-La Tène period finds from the area, some features in the southern extension of the area may well be of a LT C2 date. This is especially true for some individual layers that contain neither finds dating to LT D nor ceramics with fine comb impressions or a proportion of painted wares of 10-20%. It should be noted that the amount of ceramic material is not sufficient to allow for any statistically sound determination of dates on the basis of wares alone. Lower-lying contexts in particular include few clearly identifiable late-La Tène finds, making it possible that they date as early as LTC2.

At present, features that did not produce any finds whatsoever cannot be integrated into any discussion of chronology. These include the shallow ditches discussed above as well as almost all postholes and, in consequence, any of the postulated buildings. While pit 2117a contained several kg of iron slag, making it of particular interest, it cannot be dated because of a lack of finds.

Most features are crosscut, making it difficult to reach accurate date-ranges for individual contexts. For the large complexes of pits in trenches 2078 and 2082 it was possible to identify that the top layer, which was dug into the pits, dates to LT D1. For trench 2080 it was possible to conclude that ditch 1 actually consists of two ditches, the later one of which (1a) was filled in LT D1, while the earlier (1b) cannot be dated.

The majority of pits and ditches, or at least their upper layers, can be dated to LT D with some certainty. The c. 5m wide southern part of the excavated area, which contains most archaeological features, unfortunately does not appear to contain any ground plans of houses that could be connected to these features.

Finds

The general composition of the finds spectrum corresponds with that known from the remainder of Manching. Aside from the concentration of iron slags in pit 2117a, as mentioned above, there are only limited indicators of site function. A small area in the southern part of the excavated area, however, contained six short spear butts.[1] The significant vertical spread of these finds, which tend to date to LT D, reflects the problems of chronological differentiation of individual features in this excavation. Although a wide range of spear butts are known from Manching (Sievers 2010: No. 542–679), such a concentration is of particular note – even though all were found in what appear to be secondary deposition contexts.

A further concentration of finds was found in trenches 2079, 2081 and 2082 in the form of three bronze scrapers. One of these is a complete specimen that was part of a hygiene-set, the second is a scraper-grip, while the third is only fragment. Due to the different natures of the fragments, however, it appears that this concentration probably occurred by chance. Further finds of interest include a bell-shaped hilt-guard (*Heftstange*),[2] a fragment of an opaque glass vessel (Figure 5),[3] a prick-spur (*Knopfsporn*),[4] and a subaeratus of an eighth of an earlier Boian gold issue.[5] Of particular note is an iron brooch with cross ridge of the *Nauheim*-type of spiral construction, which is a reminiscent of a spoon-bow fibula (*Schüsselfibel*).[6]

[1] Pit 2079a [0–10 cm]; ditch 2080/1 [excavator track level and stratum II]; ditch 2081/1 [stratum II]; pit 2082 a2 [stratum I] and pit 2082/a4 [stratum I].
[2] Pit 2078/a9 [40–50 cm]; Inv.-No. 2002/9074b.
[3] Pit 2081/1g [40–50 cm]; Inv.-No. 2002/9084g.
[4] Pit 2082/a2 (stratum I); Inv.-No. 2002/9088g.
[5] Pit 2082/a [excavator track level]; Inv.-No. 2002/9086a.
[6] Pit 2078/a [0–10 cm]; Inv.-Nr, 2002/9065c.

Conclusion

As such, there is an overall interpretative impact of the E.ON I excavations for the remainder of the oppidum. The relative scarcity of archaeological features in the northern part of the excavated area is probably due to the existence of a road or street in this area, as indicated by the shallow ditches and postholes (see above). This open street ran in a SW-NE direction towards Lindach. In direct relation to the remainder of postulated roads and streets at Manching (Sievers 2001: Figure 2), the E.ON I excavations therefore indicate that Street B, as suggested by Sievers, appears to have run a few metres further south than previously believed (Figure 6). In view of the limited features identified in the E.ON I excavation area, it is possible to postulate a further street running in an N-S direction to the west of street G and heading towards the cobbled area near the central temple. There are, however, no indicators for such a street in other excavations at the site.

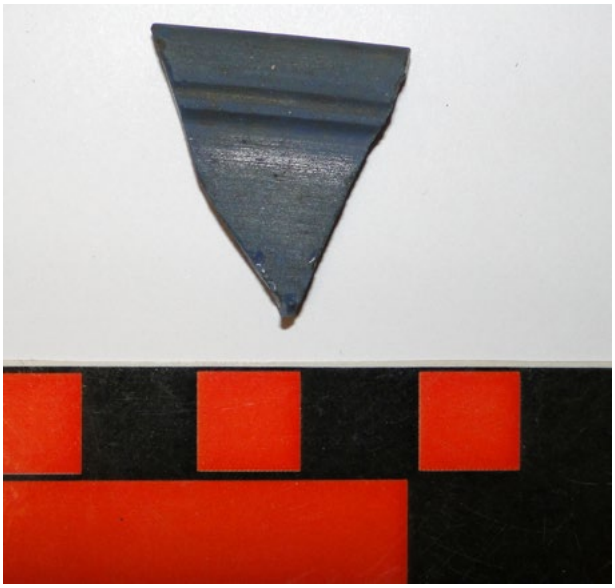

Figure 5: Manching, Inv.-No. 2002/9084g: Fragment of an opaque glass vessel. Cf. Gebhard and Feugère 1995, Figure 1: No. 1–4.

Most importantly, the E.ON I excavations showed that this part of the site was only occupied in LT C2, corresponding with data from the *Nordumgehung* area. Once again, new excavations at Manching have completely revised some earlier assumptions and predictions.

E.ON II

The excavations known as E.ON II produced neither finds nor archaeological features, despite their location in a central part of the oppidum. The absence of any archaeological record is probably caused by large-scale destruction during construction work for the adjacent airfield.

E.ON III

The E.ON III excavation area takes the form of a 5m wide cable trench, starting just north of the B16 and running north all the way to the oppidum ramparts. As some of the area had already been excavated as part of the Nordumgehung project, this project did not use a new numbering system, but extended that of the earlier excavations. Individual trenches were given existing trench numbers, but with a suffix "A". E.ON III thus included the following trenches: 786A, 813A, 818A, 832A, 827A, 832A, 837A, 841A, 845A, 851A, 886A, 893A, 898A, 905A and 912A. Initially, the southernmost part of the excavation only had a width of 1.5m. Only further north the cable trench veers off towards the east and moves away from the *Nordumgehung* area. In this sector it was extended to a width of 5m over a course of c. 55m. Even further north, between the Nordumgehung and the ramparts themselves, only the actual course of the trench, with a width of 80cm, was investigated. This area covered several sections that had previously been excavated.

Aside from settlement remains such as postholes, pits, ditches and a cellar, this area contained two features recognised as funerary in nature (Hüssen and Leicht 2003). The late Bronze Age cremation excavated in trench 851A must be seen in the context of a late Bronze Age necropolis published as part of the Nordumgehung excavations (Nieszery 1992: supplement. 17). Of particular interest, however, is a pit

Figure 6: Manching, Reconstructed streets with modification of street B (black) according to the results of the E.ON-I excavation (illustration: author after Sievers 2001, Figure 2; reproduced with permission).

containing eight human skulls excavated in trench 786A. This pit cuts a partial skeleton of a child that had been deposited in the same place at an earlier date (Figure 7). A spoon-bow fibula (*Schüsselfibel*) from the same feature as the skull deposition dates this to LT D1b.[7] All individuals are juveniles; the skulls bear no traces of force aside from one, which is punctured. As such, they cannot have been deposited as trophies but must be seen as the remains of one of several phases of burial activity that have been shown to have taken place at Manching (Lange 1983). The young age of the buried individuals, however, is of particular interest – especially since their deposition occurred during the final phase of Celtic occupation of Manching. There is no evidence for settlement activity during any period in the southeastern part of the *Nordumgehung* area, to which trench 786A connects, suggesting that the area was used for some other purpose. Still, there are no further indicators of any funerary activity in this part of the site.

[7] Trench 786A, pit b [10–20 cm]; Inv.-No. 2002/9019b.

The finds from this excavation consist mostly of ceramics and animal bone. Aside from the brooch discussed above, the only small finds of interest are a fragment of a wheel pendant and an s-shaped end of a handle with cone-shaped offset stud.[8] Both finds, as well as a sieve-vessel,[9] were found in the pit containing the deposited skulls.

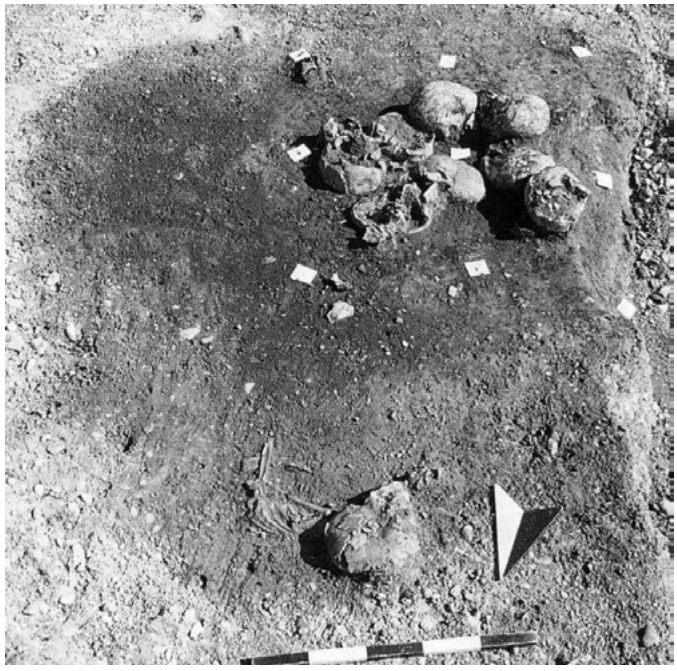

Figure 7: Manching, E.ON-III, trench 786A: Pit with 8 skulls and partial burial of a child nearby (illustration: RGK; reproduced with permission).

E.ON IV

The E.ON IV excavations covered the area of an access track for large vehicles to reach the transformer station. As part of this work, the B16 was connected to an existing farm track at the level of the *Geisenfelder Straße*, placing the excavation in the vicinity of trenches 170 and 171 that had been excavated by Gensen in 1961 (unpublished). Due to this connection, the excavated area was given the identifier 170A. Even though work affected an area of 135m2, only 37m2 of this could be investigated, as the remainder of the archaeological record had already been destroyed in the course of road works, as well as in the creation of gas pipe and cable trenches.

By combining old maps and the results of the 1961 excavations, it is possible to reconstruct a road or path in the excavated area that dates back to at least the medieval period. This was probably orientated along a main track between the western and eastern gates of the oppidum (Sievers 2002: Figure 2C). The excavations uncovered an extremely complicated setting of structures. This was recorded in ten different overall plans, three of which record parts of a 40cm thick blackish-brown cultural layer, the sub-layers of which could hardly be distinguished. The trench was excavated in 10cm thick artificial layers (Plana).

In view of the results of Gensen's excavation, it was possible to identify the remains of a gravel surface that he recorded in 1961 in Planum 1 of the eastern part of the excavated area. This contained the imprints of tracks at a distance of 1.2m from one another. This observation, as well the absolute height of this planum, indicates that the feature is probably identical to Gensen's Planum 3 from 1961. Gensen had identified imprints of tracks at distances of 1.4m (Planum 1) and 1.2m (Plana 2 and 3) from one another. The tracks run towards the east and overlay the La Tène period cultural layers. As such, they were interpreted as Roman (1.2m) and medieval or modern (1.4m). Gensen based his interpretation of some tracks as Roman on the find of a biconical lead weight within the tracks. The weight showed damage incurred during travel (Krämer and Schubert 1970: note 187). Unfortunately, the 2002 excavation could only document last traces of the lowermost tracks (1.2m width). These only survived in the eastern part of the undisturbed excavation area; the cultural layer could only be traced to a position further west. Tracks dating to the La Tène period, such as those with a width of 1.1m found near the eastern gate (van Endert 1987, 25–26), could not be documented anywhere in the excavation area 170/171.

[8] Trench 786A, pit b [10–20 cm]; Inv.-No. 2002/9019b and trench 786A, pit b [0–10 cm]; Inv.-No. 2002/9019a.
[9] Trench 786A, pit b [10-20 cm]; Inv.-No. 2002/9019b.

Planum 2, which roughly corresponds to Planum 4 of the 1961 excavation, showed several tracks running in a W-E direction through the cultural layer, as well as some remains of the overlaying gravel layer. Unfortunately, only a small area could be documented at this level since the substructure of a farm track had destroyed large parts of the excavated area. In addition, the excavations had to observe a 20cm safety margin to a recently laid telephone-cable.

Gensen uncovered similar evidence and identified large areas of so-called "clay floors" at the same stratigraphic levels. Some of these clay floors appear to have had intact, surviving surfaces. Gensen also identified hearths and fireplaces that were covered with pottery sherds. On some of these, he recognised the remains of metalworking. Such clear evidence, however, could not be documented in the latest excavations. In view of the proximity of E.ON IV to the craftsmen's quarter in the Altenfeld, the occurrence of metalworking in this part of the site is hardly surprising. Indeed, it is likely that the manufacturing area originally extended as far as trench 170.

In Planum 3, the black cultural layer can be identified throughout, apart from a small area of vitrified material. Discolouration, running in an N-S direction, can be seen in connection with several ditches identified in Planum 4. The interim Planum 3a, documented in the area of layer V, following the removal of the vitrified clay, includes a burnt hearth-plate (170A-a). In view of the superimposed vitrified material and the shape of the fill, it is fair to suggest the existence of a kiln in this area.

Planum 4 includes a number of relevant features: the discolouration 170A-2 in the northeast part of the trench appears to be a posthole in view of its shape. Further south, Planum 4 shows a discolouration consisting of two concentric circles (170A-b), which was later identified as a well. The southeast part of the trench shows two further post-like discolourations (170A-3 and 170A-4). At the centre of the trench, it is possible to identify ditch 170A-1g running in a N-S direction, which had already been reflected in the previous planum. The southwest part of the trench is dominated by a pit-like discolouration (170A-c), which could not be documented fully, as it is cut by a later disturbance and extends beyond the profile. The northern part of the trench only shows the remains of a heavily disturbed archaeological feature (170A-a).

Planum 5 shows further features, including a post-like discolouration in the northern part of the excavated area (170A-8) and similar features in its southern part, designated as 170A-5, 170A-6, 170A-7 and 170A-19. Feature 170A-d in the southeast corner of the excavated area is a pit that is only partially documented, as it extends beyond the excavated area. The features documented in Planum 4 were traced further. In places, the natural soil, in the form of light grey gravel, was reached in Planum 5.

Planum 6 largely shows the natural clayey soil, as well as the remains of features discussed for the higher plana and further post-like discolourations (170A-9 and 170A-18). A rectangular discolouration in the northwest part of feature 170A-c can be identified as the corner of trench 171 of the 1961 excavations.

Only the wells 170A-b and the pit-like structure 170A-c reach as low as Plana 7 and 8. While the well ended in Planum 8 (i.e. 240 cm below Planum 1), the pit-like feature 170A-c extends further down into Plana 9 and 10.

In summary, it is clear that comparison with the trial trenches 170-172 is relevant for the interpretation of the new excavation results. Even though preservation conditions in 2002 were significantly worse than in 1961, it was possible to identify the imprints of (possibly Roman) tracks (cf. Krämer and Schubert 1970: 51), as well as the large scale "clay floors" identified in the early excavations. The layers in which Gensen identified the 1.4m-wide tracks, however, have been destroyed since. In view of the fact that traces of metalworking were found on the intact clay surfaces in the early 1960s, and seeing that post-Celtic roads or tracks appear to have survived intact over large areas, it is clear just how much of the archaeological record has been destroyed by the construction of the road in this area – a loss that even the small trial trenches cannot balance.

The earlier excavations also documented numerous pits, postholes and (c. 20m east of the ditch 170A-1g) a further ditch running in an N-S direction. Even in combination with the new excavations, however, these features that were documented only in the small, excavated areas cannot be joined together into any meaningful structural plans or patterns.

As expected, the cultural layer that was up to 50cm deep, produced a significant number of small finds. The two key finds from this area, however, originated in feature contexts. They are: a bronze object found in ditch 1 and a ring, already published, with a glass inlay decorated with a carved hippocampus that was found in Structure C.[10] While the postholes, as well as Pit D, cannot be dated through small finds, it is possible to suggest a LT D date for the fill of well 170A-b and ditch 170A-1g. Feature C, which can neither be seen as a "normal" pit because of its significant depth, nor be interpreted as a well in view of its irregular shape, dates to the transition from LT C to LT D.

E.ON V

The E.ON V excavations did not take the form of an open area investigation, but were instead a watching brief of the excavation of a cable trench. The c. 60cm wide trench was given the identifier 2650. As part of the work, the perimeter fence of the military testing area (*Wehrtechnischer Dienst, WTD*) was moved in order to follow the course of the cable trench. The 80cm-deep cut was watched and the spoil screened for finds. Due to the very small area excavated, individual finds could only rarely be associated with concrete features.

The observed trenching work began in the north near trench 2088 of the E.ON I excavations. It followed the military perimeter fence, running beneath it, for about 95m towards the southwest. In the part identified as section 5, the watching brief documented several pits and postholes. The trench also cut ditches identified in trenches 2077 and 2081 of the E.ON I excavations. This section of E.ON V produced only few finds, which are not remarkable. They generally correspond with the wider spectrum known from the E.ON I excavations.

The further course of the cable trench towards the south (section 4) cut several features over a length of c. 108m. Of particular note is a flat adze (*Tüllenflachhacke*)[11] found in a pit identified as 2650d.

A further section running in a westerly direction for c. 100m, identified as section 3, produced no archaeological features whatsoever. The finds from this section included modern artefacts such as a massive hexagonal bolt-nut. There is remarkably little material of archaeological interest, suggesting that large scale levelling in the course of construction work for the airfield largely destroyed the archaeological record in this part of the site – as discussed for the excavation area E.ON II, which was situated in the vicinity.

Following the c. 100m section, the cable trench changes direction and continues towards the south in a wider arch (section 2). This part of E.ON V cuts through the central area that had previously been excavated. Nonetheless, it produced numerous small finds with a heterogeneous spectrum. These include a bronze object that may have been worn as a pendant, a spear butt, a further flat adze (*Tüllenflachhacke*),[12] a sixteenth century silver coin, a modern cattle hoof shoe,[13] and two German Imperial *Pfennig* coins.[14]

[10] 170A, ditch 1 [stratum I]; Inv.-No. 2002/9018h; Sievers 2007: Figure 79; 170A structure c [80–100 cm] stratum VI; Inv.-No. 2002/9016s.
[11] Trench 2650, cable-trench, sector 4d; Inv.-No. 2002/9221.
[12] All of the mentioned finds: trench 2650, cable-trench, sector 2; Inv.-No. 2002/9217.
[13] Both finds: trench 2650, fence post, sector 2; Inv.-No. 2002/9217.
[14] Trench 2650, cable-trench, sector 2; Inv.-No. 2002/9217.

The next 210m of the cable trench (Section 1) ran towards the east. Aside from one pit in the western part of this section, no features were recorded other than isolated modern disturbances. The most interesting find from this section is the foot of a *Kappel-Kelheim* type jug.[15] At the eastern end of this section, the cable trench turned south and once again followed the military perimeter fence until the *Rechliner Strasse* and the excavation area known as EADS 2002. In this area, it ran through the so-called *Trümmergelände* or rubble-field, an area largely destroyed by building work, large scale levelling and major concrete blocks. As such, it is not surprising that no features were recorded here.

E.ON I–V: Results

Altogether the five E.ON excavations showed that almost every removal of soil in Manching can change our ideas of this already well-investigated settlement. The fact, that the E.ON I-trench only showed occupation starting in LT C2 revised earlier predictions while the complete absence of structures and finds in E.ON II showed the extent of erasure during the building of the airport in the 1930s. E.ON III with its Bronze Age structures and the disposal of eight human skulls as well as a child's burial brought new insights to Bronze Age and late La Tène burial customs at Manching. While E.ON IV clarified the significance of the earlier observations and created a new idea about the dimensions of the artisan quarter of the settlement, E.ON V provided certainty that micro-scale intrusions cannot bring any insights.

Acknowledgements

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[15] Trench 2650, cable-trench, sector 1; Inv.-No. 2002/9216; Vgl. Van Endert 1991: No. 438.

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The forts of Western Scotland: An interim study of internal area

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Introduction

Iron Age research in Britain has long been dominated by settlement studies, and in particular by enclosures (e.g. Armit 1990; Champion and Collis 1996; Cunliffe 2005; Gwilt and Haselgrove 1997; Harding 2004; Hawkes 1931). Within the huge dataset of such sites identified, certain site categories can clearly be observed. Sites like Maiden Castle and Danebury are so different in size to the smallest enclosures, and so contrasting in the scale of their defences to the most lightly defended sites, that it is difficult to argue against the practicality of sub-dividing enclosed sites in Britain into classes such as hillfort, enclosed settlement, homestead or dun. Such categorisation is vital as a cognitive tool for archaeologists, and as a means to communicate our ideas – without it we cannot begin to try to make sense of the archaeological evidence, or apply our data to more over-arching issues of social structures and change in the past.

It is imperative to approach this issue however, in the knowledge that all such categorisation in archaeology is imposed by the archaeologist. Classification, even that which we believe is based on objective criteria, such as building materials or size, is effectively a product of what we, as archaeologists, deem important or relevant about sites or objects (Adams and Adams 1991; Read 2009). The community that built such a monument is unlikely to have been working to any such criteria. It is therefore important to remember that categorisation of enclosed sites should be approached in a flexible way, and that conclusions reached based on the rigid application of such classifications should not be accepted uncritically.

With this in mind, it is difficult to define exactly what a hillfort is - as a class, it is more easily distinguishable in southern Britain compared to the North and West. For Hawkes in the 1930s, "the British hill-fort in these days needs no introduction" (Hawkes 1931: 60), yet if one moves away from Wessex and into Northern Britain, this distinction becomes less certain. Sites defined as 'forts' in much of Scotland are less distinct architecturally and in size from other categories of enclosure, as compared to Southern Britain, a problem recently highlighted by Halliday and Ralston (2009). Enclosed sites in Western Scotland, in particular, are small – the region has been defined by Cunliffe as a 'strongly defended homestead' zone, and places like Argyll and Galloway contain many sites that do not fit easily into conventional categories, such as hillfort (Cunliffe 2005: 74). Research in such areas has focused mostly on small, distinctive sites such as brochs, and larger sites, generally defined as forts, have been, with some exceptions, overlooked (e.g. Armit 1990, 1991, 2003; Gilmour 2002; Henderson 2007; MacKie 1965, 1991, 2000).

This paper intends to look at the internal areas of sites that appear as 'fort' in the RCAHMS Canmore online database in Western Scotland as one of several categories being researched in an ongoing PhD project (the others are landscape position, visibility and scale of defences), in order to begin to understand the characteristics of the under researched fort category. Such approaches have recently been critiqued by Driver as outmoded due to their lack of appreciation of landscape position and complexity of defences, among many reasons, yet he concedes that they are "justified in tackling a considerable body of unsorted data in a 'scientific' processual fashion" (2013: 4-5). It can be argued that we are effectively dealing with such an unsorted dataset in Western Scotland, and that criteria such as internal area offer the most practical way of initially breaking down an unsorted database of enclosed sites on a macro scale.

What do we know?

The term Western Scotland requires some clarification. The region under discussion comprises all land west of a line from Cape Wrath to Fort William, and from there to the mouth of the River Nith (Figure 1). This includes areas conventionally considered part of 'Atlantic Scotland' such as Argyll, Skye and the Outer Hebrides, along with parts of the mainland such as Renfrewshire, Galloway and Ayrshire, and effectively encompasses a varied and little researched dataset. Much of this area has been described as a 'black hole' in terms of existing archaeological knowledge with in 2001 only the Western Isles considered relatively well researched or synthesised (Haselgrove *et al.* 2001). Most archaeological work carried out in this area has focused on distinctively 'Atlantic' sites, particularly brochs, much of the archaeological discourse focusing on the origins and dating of such sites and their role in Iron Age societies (Armit 1991, 2003; Parker Pearson *et al* 1996; Mackie 1965, 1983). Wigtownshire is perhaps an exception in that it has been subject to a considerable amount of work and research, both intrusive and landscape-based, since Haselgrove *et al*'s report was published (e.g. Cavers 2010; Cowley and Brophy 2001; Poller 2005; Toolis 2003, 2007).

The RCAHMS Canmore online database lists 565 'forts' or 'promontory forts' in Western Scotland. Most of this information was gathered by the Royal Commission in the process of completing their County Inventories (RCAHMS 1912, 1914, 1928, 1971, 1975, 1980, 1982, 1984, 1988), building on the earlier work of David Christison and Frederick Coles (Christison 1898; Coles 1891, 1892, 1893). Indeed, in certain areas fort distributions rely extremely heavily on century-old information. Two of the

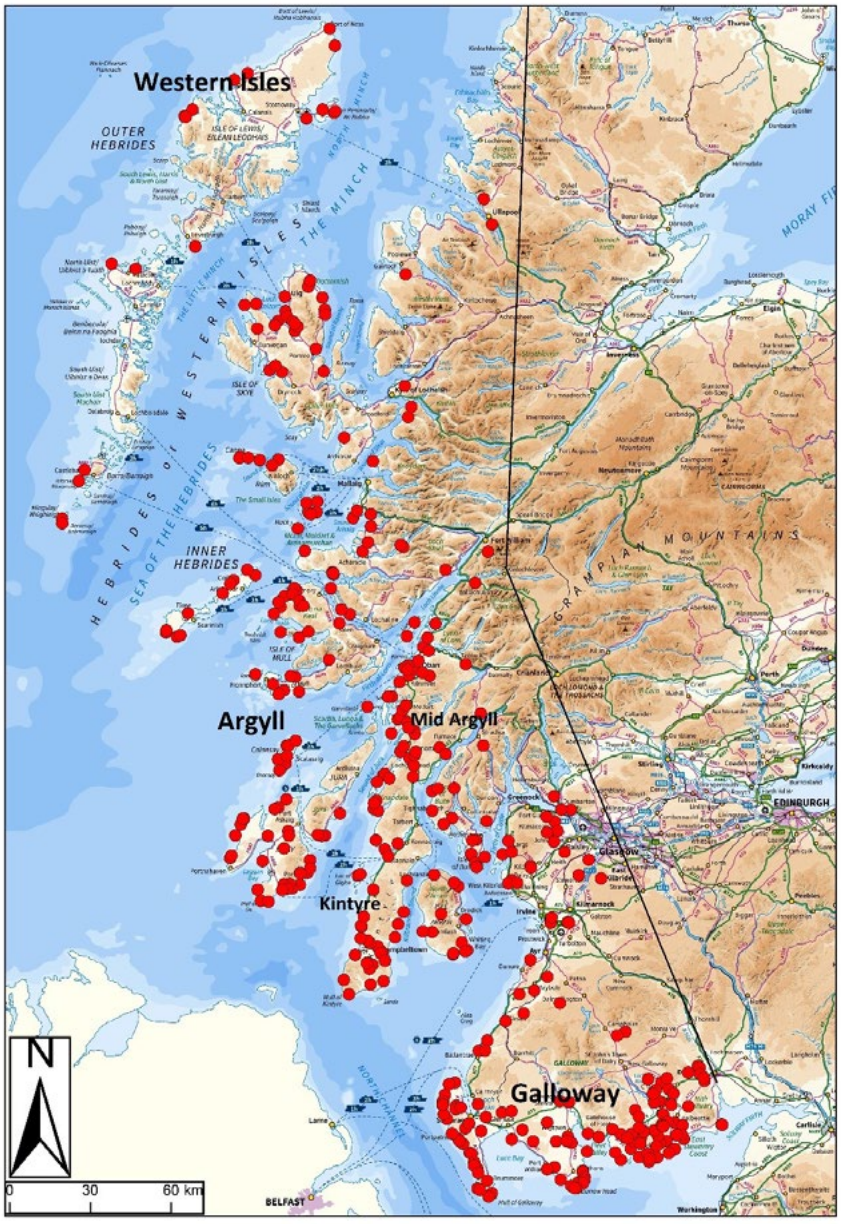

Figure 1: Distribution of sites classed as 'fort' by RCAHMS in Western Scotland. (MiniScale [TIFF geospatial data], Scale 1:1500000, Tile(s): miniscale_relief1_r16, Updated: Jan 2014, Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey Service, <http://edina.ac.uk/digimap>, Downloaded: March 2014, reproduced under the EDINA Digimap licence)

earliest County Inventories were compiled in Galloway in 1911 and 1912, and few of the sites listed have been further investigated in any detail since then (RCAHMS 1912, 1914), with the notable exception of Solway promontory forts (Toolis 2003). Site categorisation in Galloway, and elsewhere in Western Scotland has since then relied heavily upon the interpretations of a later generation of Royal Commission investigators or Ordnance Survey surveyors, their individual conceptions of what constitutes a 'fort' and the frameworks in which they were working. Individual sites have occasionally been classified as one category and changed multiple times, for varying, often unspecified, reasons.

In Argyll, an objective distinction between 'forts' and the smaller 'duns' first appears in the Kintyre Inventory, identifying a 375m^2 area division between smaller duns and larger forts (Maxwell 1969: 43; RCAHMS 1971). This was an attempt at simplifying the continuum of drystone enclosed sites in Argyll into those sites 'large enough to have served the needs of a small community' with duns 'capable of accommodating only a single family group' (RCAHMS 1971: 16), bringing together an objective, 'scientific' categorisation with social connotations. Along with potential dangers associated with *a priori* assumptions of the role of certain sizes of enclosed site in Iron Age societies, such a rigid categorisation does not deal well with the huge variety of sites that exist within both categories and fall immediately above and below the 375m^2 division. The RCAHMS' categorisation of enclosed sites in the West has been comprehensively critiqued (Alcock and Alcock 1987; Harding 1997, 2004; Nieke 1984, 1990). Yet while reclassification of smaller sites based on morphology and roofability has been attempted (Harding 1997; 2004), no comprehensive analysis of the larger enclosed sites in the 'fort' category has been forthcoming.

Compounding these problems of site definition is an exceptional lack of reliable chronologies for forts in Western Scotland. Of 565 forts in the RCAHMS Canmore database (canmore.rcahms.gov.uk) only 24 have been excavated in some way (4%) with merely nine subject to some form of absolute dating (<2%). Recent publication of the excavations at Broxmouth in East Lothian (Armit 2014) should remind us of how completely earlier occupation can be removed by later activity – it is probable that the upstanding remains of forts in Argyll and Galloway represent many more phases of activity than are detectable on the surface. Multivallate sites such as Ranachan Hill (Figure 2) and Largiemore in Kintyre may constitute the remains of many different phases of occupation or use. Any attempt to apply data generated by studies such as the examination of internal area discussed below to overarching social models is challenged by the lack of comprehensive dating evidence for forts, while little is known of the function of interiors, with very few large-scale modern excavations of the internally defined area taking place. Ambitious analyses of social organisation are greatly complicated by the possibility that sites may date anywhere between the Bronze Age and the late 1st millennium AD.

Internal area – methodology.

Margaret Nieke (1984: 90-94) attempted to calculate the internal area of forts in Argyll, but these attempts were limited to those sites that the Royal Commission had previously planned – approximately 50% of total forts. The digitisation of Ordnance Survey and RCAHMS plans and mapping allows us to attempt to study internal area more comprehensively across a much larger number of sites.

For the purposes of this study the internal areas of forts were calculated using a combination of methods. Many sites have been planned by the Ordnance Survey at 1:2500 or 1:10,000 and added to scale on digital maps, specifically OS Mastermap, allowing the use of area measuring tools in online services like Edina Digimap Roam to calculate internal area (digimap.edina.ac.uk/roam/os). While the measurements of sites originally planned by the OS at 1:2500 were found to agree with dimensions cited by RCAHMS site investigators and OS surveyors in their site reports (listed on Canmore), forts planned at 1:10,000 were often completely different. In these cases, the general morphology of the site on the 1:10,000 plan was taken to represent an accurate shape, if not size, and the measurements listed by site investigators were applied to that shape, giving an approximate area. With sites that were unplanned by the Ordnance Survey

Figure 2: Ranachan Hill, Kintyre. Multivallate and probably multi-period drystone fort. (RCAHMS 1971, reproduced with permission).

an approximate area was estimated mathematically from available RCAHMS plans, measuring length, width or diameter to obtain the most accurate area possible. If no plans of any kind were available, the dimensions and shape of enclosure listed by OS surveyors or RCAHMS investigators were used to roughly estimate the area of the monument using formulae for the area of a circle, square or triangle – although in these cases the accuracy of the results is likely to be variable. Satellite imagery such as Google Maps combined with a linked tool to calculate area was occasionally used, particularly in the case of sites with a particularly irregular shape, to aid with calculation. Finally, the areas of any sites that were personally visited were calculated accurately using a handheld GPS.

Calculating the internal areas of some multivallate sites was particularly complex. If there was no obvious evidence for multiple phasing, either in available plans or in survey reports of RCAHMS investigators and OS surveyors, the size of the innermost enclosure was used for area calculation. The multiple ramparts of Bennan of Garvilland in Wigtownshire (Figure 3) may represent many phases, but there is not enough visible evidence to support this. The lack of space between inner and outer ramparts suggests that the main area of activity was contained within the inner enclosure. Sites like Ranachan Hill (Figure 2) were treated differently. At Ranachan Hill, the ramparts marked B and C are unlikely to have formed an outer defence for rampart A, as they enclosed a much larger area, and do not appear to respect rampart A in where they were placed. The innermost rampart (A) is much better preserved than B and C and the RCAHMS Inventory suggests that it is much later (RCAHMS 1971). With obviously multiperiod sites like this, each separately distinguishable phase was considered as a separate fort and their areas were calculated accordingly.

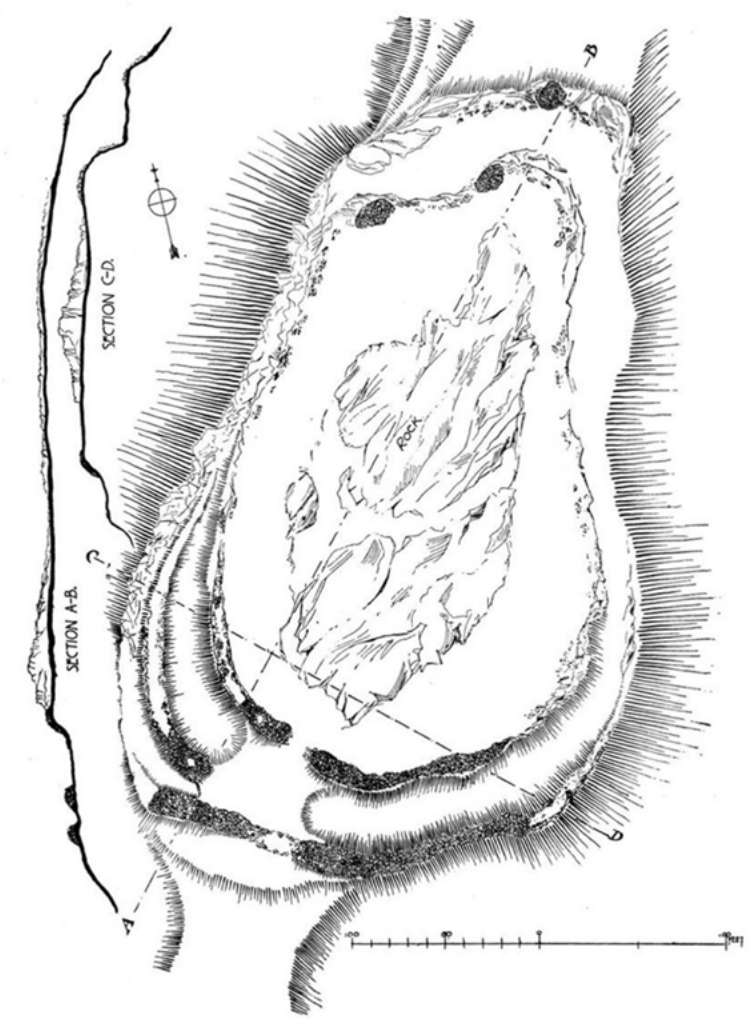

Figure 3: Bennan of Garvilland, Wigtownshire. Multivallate drystone fort. (RCAHMS 1912).

Of the 565 'forts' listed by the RCAHMS, 122 have been discarded. These discarded sites mainly represent anitiquarian records which have not been substantiated by more modern investigation by the OS or RCAHMS. Of the remaining 443, 50 had insufficient information for internal area to be calculated, leaving a total of 393 for which internal area can be derived from OS and RCAHMS plans, satellite imagery and map depictions.

Internal area - results.

Figures 4 shows the number of forts in various parts of Western Scotland divided into various categories by area, while Figure 6 displays the data for the study area as a whole in graph form. The area categories, A-G, were determined essentially arbitrarily, with those towards the larger end of the spectrum, i.e. D-G, representing a much larger span of internal areas, reflecting the smaller proportional difference between sites of 6000m^2 and 6500m^2, for instance, compared to sites of 500m^2 and 1000m^2. Figure 5 shows the comparative internal areas of forts expressed as a percentage of forts in each region.

	Argyll	Ayrshire, Renfrewshire etc.	Galloway	North West	Western Isles	Overall (Western Scotland)
A: 0-400m^2	14	1	8	4	0	27
B: 4-800m^2	57	7	20	7	2	93
C: 8-1600m^2	56	10	28	8	1	103
D: 16-3000m^2	33	7	38	6	1	85
E: 3-6000m^2	14	8	15	3	3	41
F: 6-10000m^2	6	2	3	2	2	15
G: 10000m^2+	11	6	7	0	5	29

Figure 4: The internal area of forts in Western Scotland, listed as the number of sites in each region falling into each size category. Data calculated from RCAHMS/OS plans and mapping, and own fieldwork.

	Argyll	Ayrshire, Renfrewshire etc.	Galloway	North West	Western Isles	Overall (Western Scotland)
A: 0-400m²	7%	2%	7%	13%	0%	7%
B: 4-800m²	30%	17%	17%	23%	14%	24%
C: 8-1600m²	29%	24%	24%	27%	7%	26%
D: 16-3000m²	17%	17%	32%	20%	7%	22%
E: 3-6000m²	7%	20%	12%	10%	21%	11%
F: 6-10000m²	3%	5%	2%	7%	14%	4%
G: 10000m²+	6%	15%	6%	0%	36%	7%

Figure 5: The internal area of forts in Western Scotland, expressed as a percentage of the 393 sites for which internal area could be calculated, divided up by region. Data calculated from RCAHMS/OS plans and mapping, and own fieldwork.

The figures collected show the wide variety of sizes that exist within the 'fort' category, and suggest certain regional patterns. In all regions the great majority of sites are below 3000m², with Argyll forts being particularly small – 66% fitting into categories A–C. Galloway forts tend to be slightly bigger, the majority (56%) falling into the C-D bracket, while those of Renfrewshire, Ayrshire, Dumbartonshire and Arran exhibit a slightly different pattern, with generally larger sites distributed throughout categories C-G. All regions, except the North West (Lochaber, Skye, Wester Ross, western Sutherland), show a distinct number of forts above 1ha in area, while very few forts fall into category F, or 6000-10,000m² (also see Figure 6). While it may be wrong to suggest that this certainly represents a bipolar distribution, as the G category spans a wider range of areas than others, there does appear to be a distinct class of larger forts throughout much of Western Scotland.

The average area of forts in various parts of Western Scotland is shown in Figure 7. Forts in Argyll, Galloway and the North West are clearly smaller than elsewhere, with the average internal area of promontory forts in the Western Isles exceeding a hectare. While forts in Argyll have an average internal area of 3232m², 84% are below 3000m² in area and 70% below 1600m². In Galloway the average area is 3157m² yet 78% of forts are below 3000m². This shows plainly how small the majority of forts are in Argyll and Galloway, and implies that relatively few larger sites are greatly affecting the average area statistic for both regions, supporting the possible bipolar distribution suggested in Figures 4 and 6, with a distinct group of larger forts apparent in both regions.

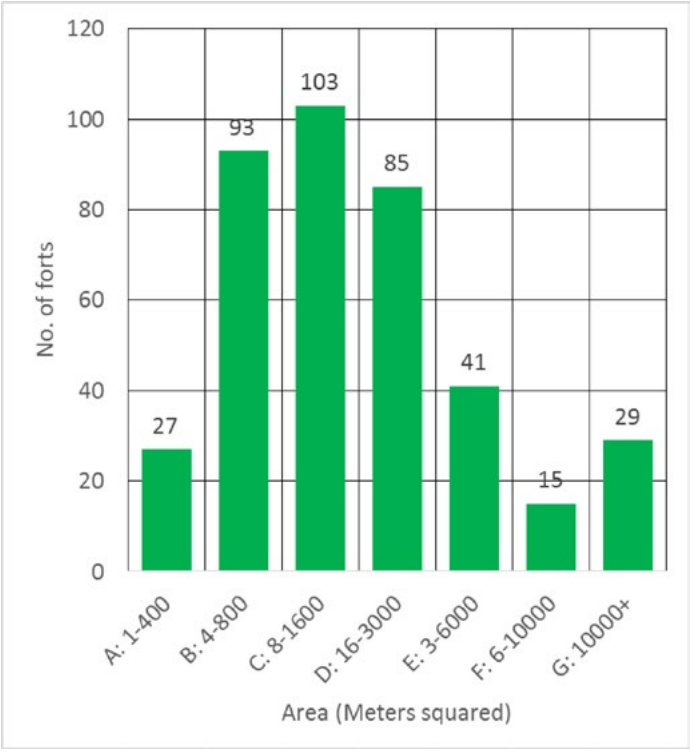

Figure 6: The number of forts falling into each area category in Western Scotland. Data calculated from RCAHMS/OS plans and mapping, and own fieldwork.

Internal area does not tell us much on its own about a site - a large interior simply implies that a fort potentially could have fulfilled a wider range of

	Argyll	Ayrshire, Renfrewshire etc.	Galloway	North West	Western Isles	Overall (Western Scotland)
Total Area m^2	614140	319813	375725	50520	174111	1538309
Average Area m^2	3232	7800	3157	1800	12437	3894

Figure 7: The total and average area of forts in Western Scotland. Data calculated from RCAHMS/OS plans and mapping, and own fieldwork.

functions for a more sizeable community than a small one, not that it did. Furthermore, some larger forts in Western Scotland make considerable use of natural topography and sheer cliffs to define their enclosures and represent relatively little construction work for their size, suggesting that a smaller community could have constructed them, compared to a similarly sized fort requiring a complete circuit of enclosure. At Creag a' Chapuill in Mid Argyll, for example, a four hectare interior is defended by a massive wall on the North and East, while access on the South and East sides is prevented by cliffs. On Eigg, a pitchstone ridge called An Sgurr is defended by a large drystone wall about 75m long on one side, creating one of the largest (5.5ha) and most prominent defensive sites in the West. Likewise, the internal area of many promontory forts on Islay and the Western Isles is considerable, with some over a hectare internally, yet the labour required to enclose them would have been considerably less than that of many smaller inland sites that were completely surrounded by ramparts. Sites that take advantage of their topographical setting in this way may differ greatly in conception from those that are complete enclosures of equivalent size. The former sites allow for possible fortification of extensive areas by small communities, albeit only in specific locations where enclosure is least labour-intensive. These topographically defended forts may then have been constructed to meet the needs, whatever they were, of very small social groups.

Conclusions and future work.

The 'problems of definition' noted by Raftery (2004: 162) and reiterated by Halliday and Ralston in relation to Scottish forts (2009: 457) are particularly relevant in Western Scotland, but in examining characteristics such as internal area on a large scale we can begin to understand enclosed sites more clearly in this area. Patterns in the internal area of forts in the region can be seen, particularly in Argyll and Galloway, where the majority of sites are small, but a number of relatively huge sites exist.

The Royal Commission's 'fort' classification somewhat masks the huge variety of sites that fall within the category, and the potential complexity of their dating and relationships with both the landscape and other sites. Further examination of the characteristics of enclosed sites may enable an alternative classificatory system to be established. Relationships between internal size and site prominence in the landscape may potentially help us to identify forts of importance beyond just the family or local level. Are the many small, heavily defended, prominent sites in Western Scotland fulfilling the same role in society as forts above 1ha in area, but for a smaller population, or are they something else entirely? Are forts that require only a relatively tiny amount of labour to enclose a large area different again in their potential social roles and functions? The study of the nature and scale of fort defences is complicated by differential survival of remains, as is potential examination of entrance morphology and orientation, but may add another layer of relatable information. Further work at a more local or regional level is required to, as Driver has put it, "examine critically the hillforts… as complex, three-dimensional architectural spaces… [and] also place these static monuments in a dynamic landscape context" (Driver 2013: 1). Examination of sites in their immediate landscape should allow us to progress further towards a more nuanced re-classification of forts and duns, and understand the potential role of various types of enclosed site in prehistoric society.

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An approach to re-examining the chronology of hillforts and other prehistoric monuments

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There are at least 4000 identified hillforts in Britain and Ireland. Yet, only an eighth of these sites have any form of dating evidence. Moreover, within this dataset there is a large variation in terms of quality and quantity. This paper outlines the methodological processes which ought to be undertaken in order to critically assess such a dataset. It is hoped that this work will provide researchers studying a wide range of prehistoric monuments with a useful and practicable approach.

In order to attain the highest levels of dating resolution and precision, all strands of dating evidence should be examined, from the most recent high precision ^{14}C dating, to stray finds from antiquarian excavations. Ideally each piece of dating information from a site should be assessed in terms of its quality and association. For example: what are the odds that a piece of dating information fits within a proposed date range, and how well does this information date a specific archaeological feature or event? It is also necessary to differentiate and quantify the disparity between sites and regions which have varying qualities and quantities of dating evidence. Crucially, if we are to compare sites with strong dating evidence to those with poor dating evidence their differences must be expressed in order to weight their contribution to an overall chronology. The methodological processes proposed are based on discussions and critiques of existing schemes, and application to current work by the author. The first half of this paper will examine a methodology for assessing the weaknesses of ^{14}C dates. The second half will describe a method for categorising sites based on the strength of their dating evidence.

Assessing ^{14}C date weaknesses

There are roughly 500 hillforts from Britain and Ireland with some form of dating evidence, though these vary considerably between sites both in terms of quality and quantity. The variable quality of this dating evidence becomes more pronounced when comparing ^{14}C dates, as their reliability and precision has improved markedly over the last 60 years. Many issues such as the various reservoirs and the old wood effect were not fully understood or taken into consideration until the late 1980s and early 1990s. It is therefore vital that ^{14}C dates are re-evaluated and their weaknesses expressed and explored wherever possible.

Ashmore previously recommended a system for expressing ^{14}C weaknesses by scoring the various issues 5, 10 or 30 points (see Figure 1) (2004b, 125). This allows any given study to implement a heuristic threshold for which determinations can be accepted (e.g. scores must be <20). Varying levels of rigor can be implemented to solve different problems, though the reasons should be adequately explained in each study. For example, higher levels of confidence are required for Bayesian analysis aimed at refining site chronology, whereas lower levels may be sufficient for examining evidence of regional activity over a broad time period. However, Ashmore's system is not without problems. The scoring of the weaknesses are arguably inconsistent, for example, ^{14}C samples which are not of a 'single entity' are awarded 5 points, whilst those samples which had 'no species identified' are awarded 10 points. This would suggest that the former category, and its related issues were less significant than the latter, though recent evidence suggests this is not necessarily the case. A bulk ^{14}C sample from Eildon Hill North (GU-2194) was examined and

Weakness	Allows for	Weakness up to
Not single entity	The possibility that contemporary and residual material will combine to provide a meaningless average date.	5
No species identified	The possibility that inclusion of marine species, driftwood, or contaminants such as coal or compacted soil.	10
Date was measured before 1982	The underestimation of errors for many ages measured before them.	10
Age at death	The possibility that a sample may or does include heartwood of old trees.	10
Problem	Laboratory or other recognised problems.	30

Figure 1: The weakness scoring system as proposed by Ashmore (2004, 125).

Laboratory number	Sample	Radiocarbon age (BP)	Calibrated date range (95% confidence)
GU-2194	bulk charcoal: birch, ash, oak, and willow	3020 ±60	1420–1050 cal. BC
GU-2373 (replicate of GU-2194)	bulk charcoal: birch, ash, and willow	2600 ±50	900–540 cal. BC

Figure 2: Two ^{14}C determinations from Eildon Hill North (Data from Hamilton 2010, 290).

found to contain oak, which has the potential for a significant inbuilt age. All oak was removed from a replicate of this sample for which the ^{14}C determination produced (GU-2373) was 420 years BP later than the original (see Figure 2) (Rideout *et al*. 1992; Hamilton 2010). This shows that the removal of material susceptible to high inbuilt ages from bulk samples can dramatically improve the probable accuracy of the determinations provided. It stands to reason therefore, that single entity samples would avoid the potential inaccuracies of mixed samples. As such, ranking one of these weaknesses over the other as being more harmful to dating accuracy is subjective.

There is an overlap between Ashmore's 'no species id' and unknown 'age at death' indicators. A charcoal sample with no species identification could potentially include an old wood species with an unknown age at death. Resultantly, if 'no species id' was conceded for a charcoal sample, an unknown 'age at death' weakness would automatically apply. The rating system would therefore doubly penalise this particular group of samples. Furthermore, the allocation of 30 points for other problems is problematic as these can vary widely in significance.

It has been suggested that the uncertainties on all the ^{14}C dates measured prior to 1982 should have corrections applied as they were often underestimated by laboratories (International Study Group 1982, 619; Ashmore 1997, 239). Ashmore suggested the implementation of a correction which multiplied all quoted errors by 1.4, and if the result is still under 110 years to increase it to 110 years. However, practical application of this correction provides dates that are almost always too broad to be usable in any meaningful sense. More importantly, this broad brush approach is likely to be excessive for laboratories which were including accurate error estimates at the time.

More recently Becker *et al.* (2012) proposed an alternative grading system which assigns two separate grades to each ^{14}C date. All ^{14}C dates are graded based on their sample quality and association quality. The sample quality refers to the degree of confidence to which a sample reflects the date at which it stopped take-up of ^{14}C. The association quality refers to the degree of confidence to which the ^{14}C sample relates to the specific archaeological feature or event which is being dated (Becker *et al.* 2012, 20). It is suggested here that the sample quality grades should be expanded to include issues such as noted laboratory problems,

Grade	Sample Quality	Association Quality
1 - Excellent	Must be short-lived, single-entity samples; no issues.	Relates directly to 'event(s)' being dated
2 - Good	Must be short-lived; may include multiple-entity samples from distinct deposits only; no issues.	Relates reliably to 'event(s)' being dated
3 - Moderate	Includes multiple entity samples from single contexts and samples which may be affected by old wood effect.	Likely to be contemporary with feature of interest
4 - Poor	Includes samples from multiple contexts, with no information or with serious laboratory issues.	May or may not relate to event/feature in question

Figure 3: Summary of weakness scoring system as proposed by Becker et al. (2012, 19-21).

for example inaccuracies of early Gakushuin dates (Spriggs and Anderson 1993), the old wood effect and samples suffering from the various reservoir effects (Ascough *et. al.* 2004; 2010). Any samples suffering from these issues should be excluded from the top two sample quality grades. With recognition of these caveats, this grading system provides a fair and clearly laid out approach, and is recommended for the assessment of ^{14}C date weakness.

The following study utilises a grading system based on that proposed by Becker *et al.* (2012), with modifications to make the sample quality grade more inclusive and account for many pertinent issues which can affect ^{14}C dates. A brief summary of these grades is outlined below (Figure 3) but should also be consulted in Becker et al. 2012 (19-22) for further information.

Site assessment and categorisation

When dealing with a large number of sites with varying levels of dating evidence it is important to distinguish between the well dated and poorly dated sites. For example, in their study of hillforts in South-East England Hamilton and Manley (2001) created a three-phased chronological division. Placed within this were sites such as Hascombe, Surrey with 20 ^{14}C dates, alongside sites with only stray material culture such as Castle Hill, Newhaven, or which were dated based solely on morphological parallels such as Hammer Wood in Sussex. Combining well dated sites with those that are poorly dated effectively devalues the proposed chronological scheme. Instead it is clear that distinctions between the strength of dating evidence of each site should be clearly expressed. This enables the construction of chronological schemes where increased weighting can be given to sites with stronger dating evidence. This will allow for a more critically discerning study, providing a more robust chronological scheme.

Any assessment of a sites dating evidence should include a statement as to the extent this evidence is believed to fully encompass the occupation of the site. In particular, higher thresholds should be set for sites with external or internal areas which significantly exceed the average for the monument type, and for sites with numerous phases indicated by complex stratigraphy. Naturally these require subjective assessment, however a common-sense approach is to be taken, and any particular issues which affect this assessment are to be clearly stated. The following thresholds are based on the subjective assessment of the quantity and quality of dating material required to construct an accurate and practicable chronology for any hillfort:

Grade A – Excellent

Small or relatively simple sites should have at least 20 good ^{14}C dates from a variety of contexts, in addition to any other scientific methods and datable material culture. This threshold should increase proportionately with the complexity of the site. The proposed thresholds have been established during the course of research as providing a good indication of the level of detail to which site chronology

can be determined. Ideally all sites within this grade should be integrated within a Bayesian site model. In all cases the dating evidence provided should be understood as giving an accurate and well understood chronology for all known phases of the site - this point will be a deciding factor for any site which sits on the threshold of this grade. This may be conditional based on the calibration curve, as a sites phasing which falls within the Halstatt plateau can be difficult to interpret in any detail.

Grade B – Good

Sites should have at least 10 good ^{14}C dates from a variety of contexts in addition to any other scientific and material dating methods. In all cases the dating evidence provided should be understood as giving an accurate understanding of the chronology of the primary site phases. Any sites which fall just short of the ^{14}C threshold but are judged to have an accurate and well understood chronology of the primary phases can also be accepted.

Grade C – Moderate

Sites should have at least 7 highly graded pieces of dating evidence from a variety of contexts including ^{14}C dates in addition to other scientific and material dating methods. The dating evidence provided should be understood as giving a general outline to primary phases of the site.

Grade D – Poor

Sites should have at least 3 pieces of dating evidence including ^{14}C dates in addition to other scientific and material evidence with quality of a Grade 3 or above. The dating evidence provided should be understood as giving an incomplete yet somewhat informative outline of possible periods of site phasing.

Grade E – Very Poor

Sites should have at least one piece of any form of dating evidence including the poorest rated ^{14}C dates, in addition to any other scientific methods, site morphology, historical sources or datable material culture. The dating evidence provided should not be considered as giving a full or even partial picture of the sites phasing.

Grade F – No Dating Information

Practical Approach and Considerations

A practical approach to implementing the quality control criteria for ^{14}C dates is as follows:

1. Data gathering: Collect all dating evidence from a site into a table or document
2. Investigate and note each piece of dating evidence for sampling issues
3. Investigate and note each piece of dating evidence for association quality
4. Assess and grade the site as a whole based on the quality and quantity of dating evidence
5. Repeat for each site in the proposed chronological system until complete set of sites are represented

The most commonly encountered issue when implementing this approach is incomplete reporting of dating evidence in publications or excavation reports. An example of this is the labelling of sample as simply ‘charcoal’ with no further species identification (Becker et al. 2012, 21-2). Another example is limited or no contextual information stated. In these cases it is sometimes possible to fill in the missing data by consulting the excavator or author of the publication directly, though this can be a time consuming process and is often not viable. In these cases the dating evidence must be categorised based on the best available evidence.

Application of the grading system to Scottish hillforts

The following section will examine five Scottish hillforts which fall into the aforementioned site grades, and will provide explanations how sites achieve their grading. A detailed examination of site phasing and chronology will not be undertaken here.

Broxmouth, East Lothian – Grade A

Only recently fully published, Broxmouth (Armit and McKenzie 2013) is one of the most extensively excavated hillforts in Britain and Ireland. The site features 158 ^{14}C samples from 101 individual contexts (Hamilton *et al*. 2013, 192). These include 35 ^{14}C samples submitted in the 1980s and 123 submitted from 2009-2012. The former ^{14}C samples are often bulk samples and a number have uncertain contexts. These are therefore rated average or poor. The latter dates fare better in terms of associations and sample quality though not all were deemed reliable enough to be utilised in the Bayesian model of the site. Nevertheless, this site has well over the threshold of dates to qualify for the highest grade of sites. Importantly, the authors note that the site was heavily affected by truncation from the final phases of hillfort occupation in antiquity (Armit and McKenzie 2013, 19-21). The effect of this truncation cleared away much of the evidence for early occupation at the site, leaving the only traces in protected negative features or areas sheltered by overburden. This leaves the early phases of the site with considerably less dating evidence than the later phases. It is argued that had the excavations been less extensive, they would not have picked up on some phases of the site. It is therefore important to consider this inherent bias of truncation, both modern and ancient, on other sites with less dating evidence. Nevertheless, it is still maintained that all phases of the hillfort are sufficiently dated to attain this grade.

Eildon Hill North, Scottish Borders – Grade B

This hillfort features thirteen ^{14}C samples, all of which have grades two and above for both sample quality and association quality. Bayesian modelling of these dates has further refined the chronological model given the small number of samples dated (Hamilton 2010). This is based on the dating of two pre-rampart features and phases of three house platforms. This is argued to provide a relatively well understood chronology for the main phases of this site.

Trusty's Hill, Dumfries and Galloway – Grade C

This site features nine ^{14}C samples along with three pieces of datable material culture. Seven of the ^{14}C dates and two pieces of datable material culture relate to the early historic occupation of this hillfort. Two ^{14}C dates suggest a strong likelihood of Early Iron Age occupation at the site with dates 2345 ± 30 BP (510-380 cal. BC; SUERC-41599) and 2350 ± 30 BP (520-380 cal. BC; SUERC-41601) from a construction deposit and a post-hole fill respectively (see Figure 4) (Toolis and Bowles 2013, 43). Along with the probable Iron Age glass bead (of Guido Class 8; Guido 1978) this evidence indicates Iron Age activity at this site. Whilst there is ample evidence for the early historic hillfort it is not possible to claim with any certainty for an Iron Age hillfort at this site, although the dating evidence suggests this possibility. As is seen at Broxmouth, truncation in the later phases of site occupation may destroy the evidence for the earlier phases. The evidence from Trusty's Hill indicates this may be a similar case. As such only a general outline of this sites phasing is suggested as being understood.

Craigs Quarry, East Lothian – Grade D

Excavated by Stuart and Margaret Piggott in the early 1950s, the fort at Craig's Quarry provided a quantity of material culture including undiagnostic pottery sherds and clay mould fragments (Piggott 1960). The datable material culture includes a copper-alloy brooch of Hull and Hawkes type 3B variant (Hull and Hawkes 1987,

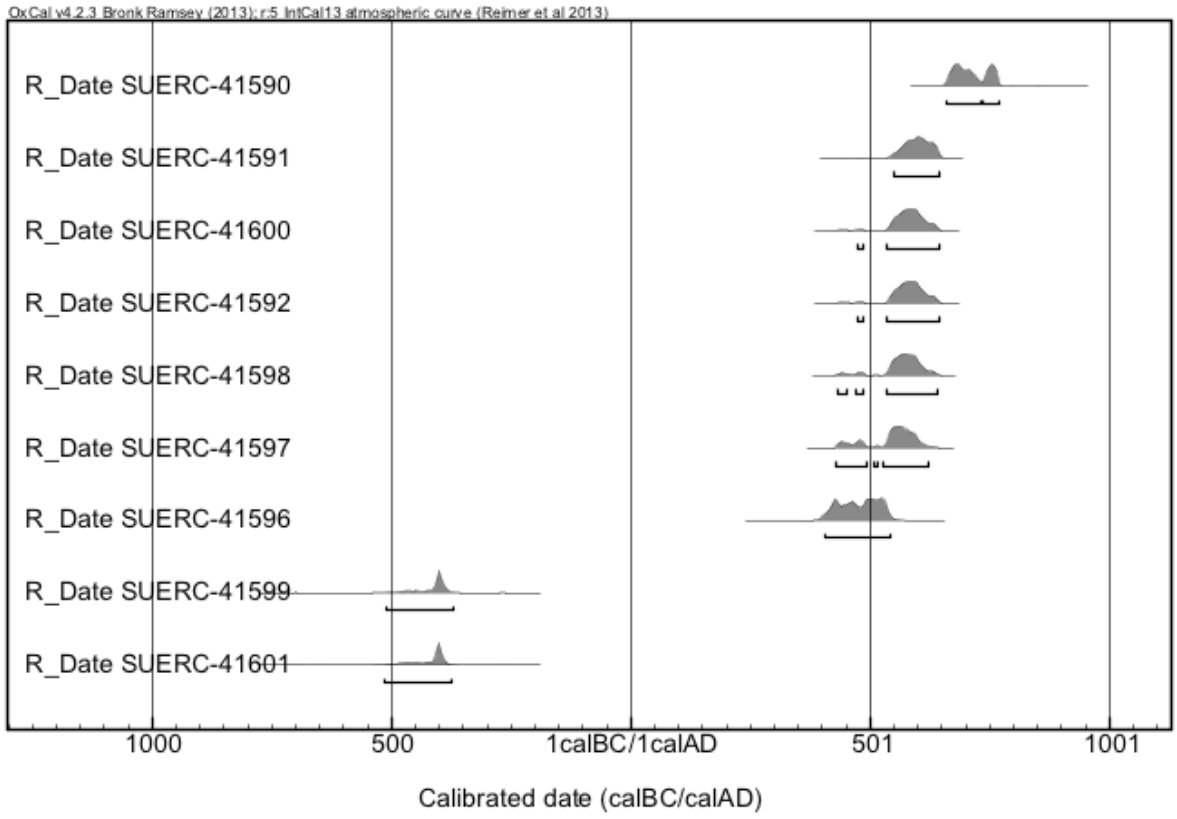

Figure 4: Calibrated ^{14}C dates from Trusty's Hill, Dumfries and Galloway (Data from Toolis and Bowles 2013).

175), which was located on the floor of the house near to the hearth. This type is dated to the first century BC (Adams 2013, 118-9). At least 15 stone balls of a type common to hillforts in East Lothian are known from the site. From the Broxmouth assemblage it has been argued that the smaller examples can be dated to phases 3 to 5, giving them a dating range of the fourth to the first centuries BC (Armit and McKenzie 2013, 341). Second century AD samian ware found in the overburden overlying the excavated house probably dates the post-hillfort activity at this site. The dating evidence cannot be seen as providing a complete picture of the chronology of this hillfort, though it does point to occupation of the hillfort in the Late Iron Age.

Castle Law, Abernethy – Grade E

This fort was excavated by David Christison at the end of the nineteenth century (Christison and Anderson 1899). The only closely datable material culture recovered was that of a Hull and Hawkes type 1C brooch, the type having been dated from the third to second centuries BC (Hull and Hawkes 1987, 131; Adams 2013, 109-110). Unfortunately the context of this find was not recorded. This evidence therefore provides only a vague indication of the chronology of this hillfort.

Conclusion

Robust chronological schemes rely on the critical assessment of the dating evidence for each site. By categorising sites based on this dating evidence it is possible to evaluate their contribution to these local and regional chronological models. An awareness of the many issues which occur in this evaluation process is vital to its success. Radiocarbon dates must be critically assessed based on both sample and association quality with any weaknesses being clearly stated. Other issues, such as truncation at sites by later phases of occupation, can have significant implications for our understanding of the chronology of prehistoric sites. This problem is compounded in Scotland due to the comparative lack of datable material culture during

the 1st millennium cal. BC. A focus on scientific dating methods, is therefore essential in mitigating this problem. In particular, the continuing refinement of ^{14}C dating and the application of Bayesian modelling provide the greatest hope for further improvements in precision and accuracy of chronological models.

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Burning Questions: New Insights into Vitrified Forts

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Introduction

While vitrified forts are often considered to be indicative of warfare, this is far from clear and just as the nature and function of hillforts are subject to debate (eg Armit 2007; Lock 2011) so too are vitrified forts. This paper outlines the current academic paradigms before discussing evidence from two case studies in Aberdeenshire and Stirling (Figure 1). The sites' and their immediate locale are discussed in the context of the two prevailing models: destruction by enemy action or as ritual closure. Explicitly, following Cunliffe (2005: 347) and Armit (2007: 25), the term 'hillfort' is used as a portmanteau term to describe enclosed sites of various sizes, in different locations.

Vitrification

Vitrified forts contain timber laced ramparts that were subsequently set fire to and in which the stone reached temperatures in excess of 1000° C, melted and, in extreme cases fused into large blocks (Mackie 1976; Ralston 2006: 150-1). Several models behind this process have been discussed: accidental fire, constructional factors (a deliberate act undertaken to strengthen the rampart), and a deliberate act of destruction (Mackie 1976; Ralston 2006: 162-3). Yet the unpredictability and investment involved in vitrification lends increasing weight to the latter interpretation of deliberate destruction (Ralston 2006: 163). Thus a vitrified fort represents the combined efforts of a community over a prolonged period of time and consumed significant quantities of timber. The smoke would have been visible for miles during the day and at night the fire would be visible for even further. It would have represented a highly impressive statement of power and symbolism, but who was viewing it and from where?

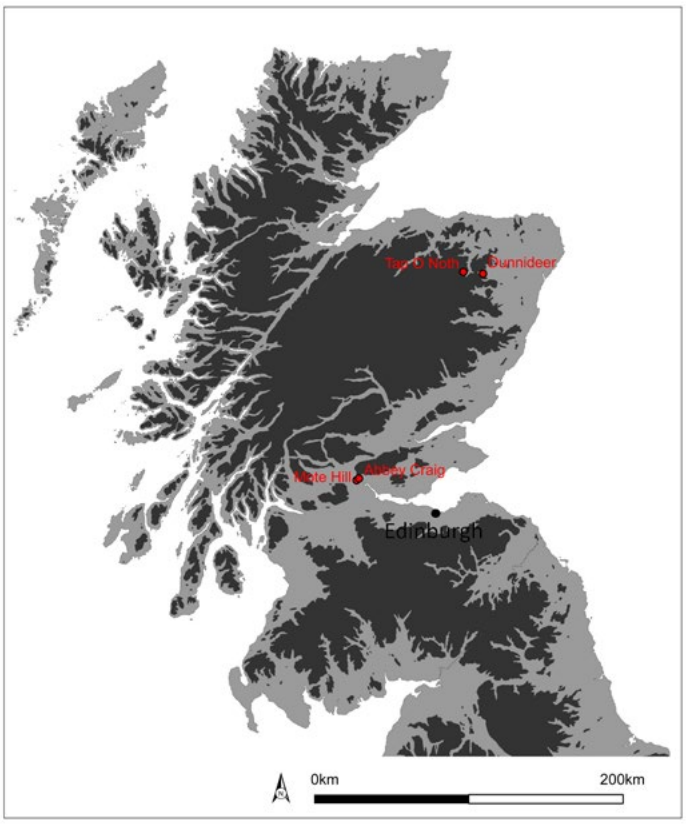

FIGURE 1: LOCATIONS OF SITE MENTIONED IN TEXT

To be explicit, the vast majority of vitrified forts are an accidental by-product of firing a timber laced rampart, and not all such events would produce vitrified material and indeed non-timber laced ramparts cannot produce any at all. Thus the number of vitrified hillforts represents a fraction of the sites that could have been destroyed by fire. It may also be the case that on sites such as Dunnideer and Tap o'Noth (RCAHMS 2007: 101), where the volume of vitrified material is so extensive, that the effect was planned for and may have required more than one of firing. In such examples the intention may have been to create a permanent memorial to such power? While initially thought to be a Scottish phenomenon (Mackie 1976), or linked to Gauls fleeing Rome (Cotton 1954), it is now clear that vitrified fortifications are found across European prehistory and history and the process has no wider diagnostic connotations (Ralston 1981; 2006: 143-63) and while at present there are no vitrified structures in England or Wales the process is likely to be related to the slaked (limestone) ramparts of the Welsh Marches (Cunliffe 2005: 636; Moore 2006: 63).

Just as the role of hillforts and violence has changed with current social mores over the last 100 years (James 2007; Cook 2013b) so too has debate over the nature of vitrified forts. There are two key interpretations the first is destruction by enemy action and representing the systematic and complete destruction of a site after conquest by an enemy force (Mackie 1976, 206-10; Armit 2005: 53; Harding 2012: 228-45). However, in the absence of supporting evidence (historic texts and skeletal remains) such sites have also been interpreted in a ritual context: for example Harding has suggested that sites such as Dunnideer and Tap o'Noth have parallels to both European Viererckschanzen and the Banqueting Hall at Tara (Harding 2004: 87). Indeed, another related example, Finavon (Alexander 2002), derives from a 'nemeton' place-name (Watson 1926: 250), which have been linked to ritual locations in accounts of 'Celtic' religion (Ross 1974: 62-3), although this appears to be the only such example. The subsequent destruction of vitrified forts may represent an act of ritual closure (Armit 2005: 52-3), as has been frequently found amongst Neolithic ritual monuments (Noble 2006). Indeed, excavation of the unenclosed roundhouses sequence around Kintore, Aberdeenshire (Cook & Dunbar 2008: 342-44) revealed a persistent pattern of destruction by fire from the Middle Bronze Age to the Late Iron Age. This evidence was interpreted by the authors (op cit, 342-44) as part of a pattern of ritual associated with abandonment (LaMotta & Schiffer 1999).

Two pairs of hillforts in two different locations (Figure 1) will be considered by this study: the first in the Don Valley of Aberdeenshire and the second to either side of the historic lowest crossing point of the Forth at the City of Stirling. This analysis will show that there is clear evidence for different motivations behind the vitrification of different hillforts.

Aberdeenshire

The Aberdeenshire hillforts (Dunnideer and Tap o'Noth; see RCAHMS 2007: 100-1 for plans) sit within a discrete cluster of 20 hillforts, which have formed part of a bigger study, The Hillforts of Strathdon, which has been published elsewhere (Cook 2013a). In turn both sites form part of a regionally specific hillfort grouping: the oblong series first identified by Feachem (1966: 67, fig 5). They are rectangular, with massive stone timber-laced ramparts, frequently vitrified, without obvious entrances, often on prominent hilltops, and most commonly found between the Firth of Forth and the Moray Firth in two discrete clusters: the first at Angus, Perthshire and North Fife and the second around Inverness (Cook 2013a: fig 3). The two Aberdeenshire sites sit between these two larger clusters. The oblong series' precise date has also been subject to vigorous debate (Alexander 2002; Cook 2010): more recent archaeomagnetic and radiocarbon dating suggests that they were destroyed in the closing centuries cal BC (Gentles 1993; Ralston 2006: 151), perhaps with a floruit centred around 250 BC (Cook 2010).

The Hillforts of Strathdon study (Cook 2013a) suggested that hillforts are constructed between c 600-500 and c 200 BC, and that there was a change in design from multi-vallate enclosures with multiple entrances

to uni-vallate with single entrances (and on occasion timber laced ramparts), culminating in the oblong series and no de novo hillforts built until the Early Medieval period.

Dunnideer and Tap o'Noth are located within 13km of each other. Dunnideer, measures 67m by 27m, is located at 268m od. Tap o'Noth measures 100m by 40 m, sits at 461m od and was destroyed by fire between 200-1 BC. Both hillforts are extensively vitrified around their entire circuit (RCAHMS 2007: 100-1).

The dating evidence from oblong forts is complex. Two dates were obtained from the base of the collapsed rampart of Dunnideer: 2180 ± 30 BP (SUERC-22161) and 2210 ± 35 (SUERC-28730). Calibrated to two sigma (95%) these date to 370-160 BC and 390-190 BC respectively. These dates pre-date the vitrification of the rampart. A third set of dates were obtained via archaemagnetic dating of the vitrified material which gave at two sigma (95%) gave a calibrated range of 606-257 BC (Cook 2010), indicating that the rampart was fired between these dates. While this latter has a very large error range earlier archaeomaganetic dates by Gentles (1993) on other oblong forts indicates a consistent range of between 200 and 1 BC, suggesting that the Dunnideer archaeomaganetic dates are more likely to lie to the later end of the date range, i.e. c. 257 BC. Considered together, these various dates indicate that the rampart was most likely fired between c. 390 and 257 cal BC. In turn assessing both the Dunnideer archaeomaganetic and radiocarbon dates suggests that the Dunnideer rampart was most likely fired at the latter end of the date range ie around 300-250 BC (Cook 2010). While some commentators have expressed caution over the accuracy of archaeomagnetic dating (eg Batt 1997; 2014), the actual critiquing of the date above is beyond the technical skill of the lead author.

City of Stirling

The second case study concerns the two hillforts to the immediate north and south of Stirling Bridge, the location used by William Wallace to great effect during the Battle of Stirling Bridge in 1297. The Forth Valley was for millennia either under water or covered in large bogs (Davies 2006). Into this low-lying area projected two promontories: Gowan Hill and Abbey Craig. In turn this location also marked the upper tide limit of the Forth and thus the lowest crossing point of the Forth ensuring that Stirling was the only

Site	Sample	Material	Description	Context	Uncal BP	Calibrated 1-sigma	Calibrated 2-sigma	Delta-^{13}C %
Dunnideer	SU-ERC-28730	charcoal	Burnt wood within collapsed rampart	Primary	2210 ± 35	330-270 BC -28.00% 260-200 BC (32.1%)	390-190 BC	-25
Dunnideer	SU-ERC-22161	charcoal	Burnt wood at base of collapsed rampart	Primary	2180 ± 30	360-280 BC (44.7%) 240-160 BC (23.5%)	370-160 BC	-25.9
Mote Hill	SU-ERC-48989	charcoal	Burnt wood at base of collapsed rampart	Primary	1889 ± 29	AD 68-135	AD 58-217	-26
Abbey Craig	GU-9767	charcoal	Burnt wood at base of collapsed rampart	Primary	1370 ±45	AD 615-695	AD 590 -730	*
Abbey Craig	GU –8766	charcoal	Burnt wood at base of collapsed rampart	Primary	1400 ± 40	AD 615-670	AD 560 -700	*
Abbey Craig	SU-ERC-46245	charcoal	associated with use of outer rampart	secondary	1221 ± 27	AD 772-869	AD 765-886	-26.5

Figure 2: Radiocarbon dates (* this data was not included in Main (2006))

Events	Date	Source
Romans (Agricola)	AD 70s/80s	Fraser (2009, 380)
Romans (Antonine)	AD 140s	Fraser (2009, 380)
Romans (Septimius Severus)	AD 200s	Fraser (2009, 380)
Romans (Pictish Wars)	AD 3-400	Fraser (2009, 381)
'Picts' (Barbarian Conspiracy)	AD 367	Fraser (2009, 380)
Battles		
Restitution of Iudeu	AD 655	Fraser (2009, 383)
Dun Nechtain	AD 685	Fraser (2009, 380)
Viking eg Battle of Dollar)	AD 875	Woolf (2007, 111)

Figure 3: historical events that could have impacted Stirling. The calibrated ranges of the dates used are determined from the University of Oxford Radiocarbon Accelerator Unit Calibration Programme (Oxcl3://www.rlaha.ox.ac.uk/oxcal.htm)

East Coast land route north or south. This route appears to have been exploited by the majority if not all military expeditions into or from Scotland north of the Forth from the Romans to the Jacobites in 1745. During the 1st millennium AD it is likely that the following military events involved some impact or transit through Stirling (Figure 3).

Regardless, even if one could not identify specific events that might be related to conflict around Stirling, there are multiple records of both sieges and firings of hillforts across the third quarter of the 1st millennium AD (Alcock 1988).

Mote Hill, at the northern tip of Gowan Hill, is a small sub-circular vitrified enclosure measuring 32m east-west by 35m north-south, with an entrance to the south-east and two flanking earthworks (Figures 1 and 4), and which has been the traditional medieval execution place for Stirling, most notably featuring the former Regent of Scotland Murdoch, duke of Albany and indeed one of its alternative names is Heading (as in be-heading) Hill related to this function (Ronald 1899: 103; Figure 5). It may be that this function represents an attempt to draw upon older, ancient identities in order to reinforce the then current regime. Excavation by the lead author in 2012 uncovered oak charcoal from the destruction layer (Figure 6), which was dated to 1889 ± 29 BP (SUERC-48989), and which when calibrated to two sigma (95%) gave a range of cal AD 58-217. This means that the fort was destroyed after cal AD 58-217. In addition, the site was subsequently refortified though precisely when is unclear. A second date was obtained from a hazel nut shell from pre-vitrification midden layer: 1928 ± 29 BP (SUERC-57508), which when calibrated to two sigma (95%) gave a range of cal AD 7-131, indicating that the timber laced fort was built before this point. It is feasible that the two radiocarbon measurements are the same age, as the measurements pass a chi-square test (T=0.9; df=1; T'(0.05)=3.8) (pers comm Dr Tony Krus).

The second site, Abbey Craig (Figures 1 and 7), is better known as the location of the National Wallace Monument, which celebrates William Wallace's victory at the Battle of Stirling Bridge (1297). Unfortunately, the construction of this monument also mutilated an underlying hillfort, often thought to be Wallace's HQ ahead of the battle. The hillfort comprises a bivallate enclosure, the inner area of which measures 53m by 38m and ins enclosed by a rampart up to 1m high and 3m wide, some 30 m beyond the inner enclosure is a second one measuring 3.5m thick and 0.9m high. Excavation by Bruce Glendinning in 2001 (Glendinning 2001; Main 2006) recovered both charcoal associated with the destruction of the inner rampart and evidence for its refortification. Charcoal from the destruction layer was dated to 1370 ±45 BP (GU-9767) and 1400 ± 40 BP (GU –8766), which when calibrated to two sigma (95%) gives ranges respectively of cal AD 590 to 730 and cal AD 560 to 700.

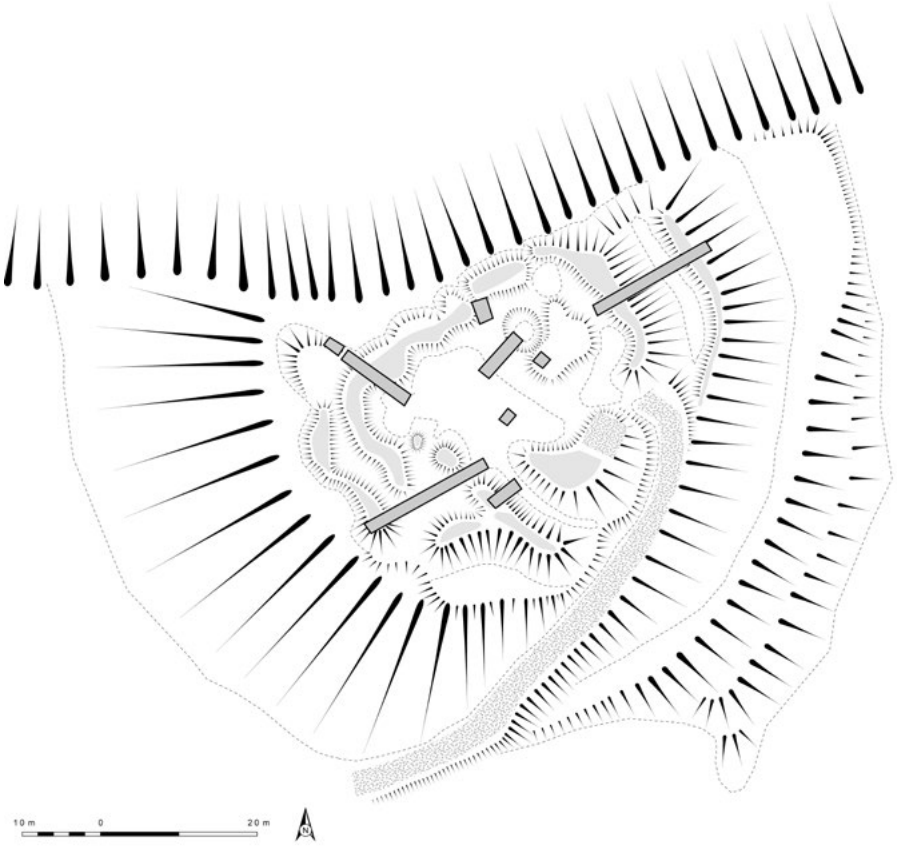

Figure 4: Mote Hill trench location plan

Figure 5: the Beheading Stone looking towards Abbey Craig

Figure 6: Mote Hill rampart under excavation

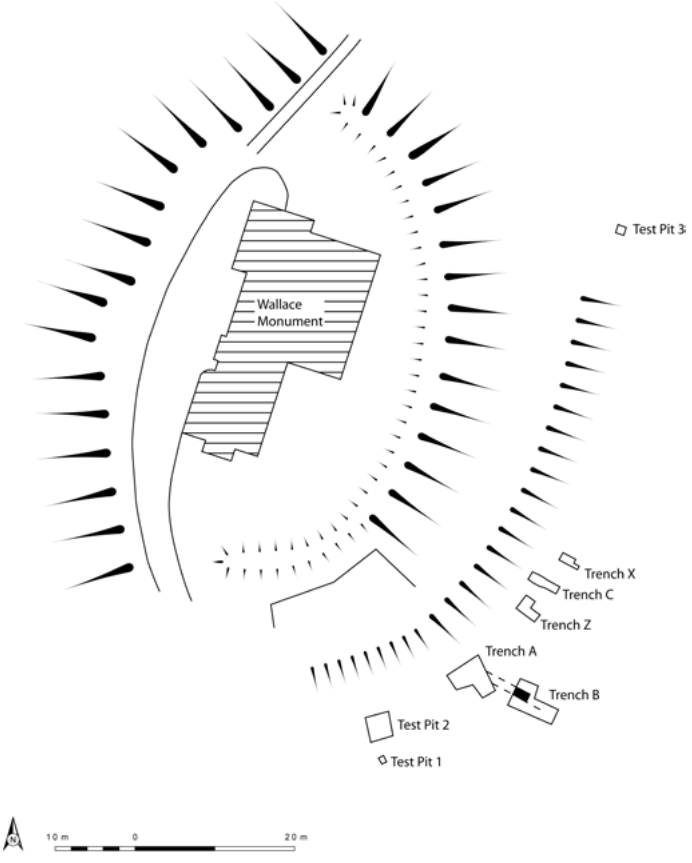

Figure 7: Abbey Craig trench location plan

Subsequent excavation by the author in 2011 revealed a fragment of a third outer rampart (Figure 8), which contained re-deposited vitrified material, ie it had been constructed after the destruction on the inner rampart. A sample of alder charcoal in association with this rampart was dated to 1221 ± 27 BP (SUERC-46245), which when calibrated to two sigma (95%) gives a range of cal AD 765-886.

Discussion

With regard to the Aberdeenshire evidence, it is extremely tempting to view the entire sequence as the emergence of discrete polities in large agglomerations, clashing over resources, resulting in ever more sophisticated defense systems (timber lacing, larger ramparts, fewer entrances) and concluding in citadel like refuges (the oblong series). However, the long duration of the oblong series' destruction indicates a conflict stretching over at least 50 years. It may therefore be more likely that they represent social competition, expressing itself through their construction and subsequent destruction rather than conflict. Indeed, this

extended floruit may simply represent the time required to assemble and transport the necessary resources required to both construct and subsequently destroy them in an appropriate manner and similar arguments are proposed for funerals and the associated resources required for feasting (Miles 1965). In this context, it is worth stressing the difficulty of achieving significant quantities of vitrification (Ralston 1986) and it may be that with specific regard to oblong hillforts that vitrification was the desired outcome and its scale and extent a source of pride and celebration. It is worth remembering that Dunnideer's destruction was in fact earlier than Tap o'Noth's and that Tap o'Noth was larger and in a more spectacular location than Dunnideer and therefore required enormously more resources and effort to construct and destroy and would have been a considerably greater spectacle. As the two sites are only 13km apart it may be that they represent the successive efforts of children or grandchildren trying to outdo the achievements of their forebears, it might also be that the if sufficient notice were given that resources were drawn from cross the entire North-East of Scotland. In addition, presumably, like any modern festival the forthcoming spectacle would have been known about and awaited with baited breath.

Figure 8: Abbey Craig rampart under excavation

In contrast, the Stirling hillforts are less extensively vitrified than the Aberdeenshire ones and clearly represent a single phase of destruction, albeit at different dates for each site. Given this it may be that vitrification was secondary unintentional by-product of firing the rampart, which is argued to make destruction by enemy hands more likely. That both sites were subsequently refortified underlines the strategic importance of this location and may reduce the likelihood of the site having been ritually destroyed. While this case is more tenuous it is argued that the Stirling forts were likely to have been vitrified as part of the various conflicts in this part of Scotland across the 1st millennium AD. Certainly, this fits with the existing prevailing models of contemporary society (Fraser 2009: 66), although of course, conspicuous consumption and ritual played a role in the design and construction of Early Medieval hillforts (eg Driscoll 1998; Campbell 2003).

Conclusion

The paper has summarised the evidence from two sets of vitrified hillforts in the City of Stirling and Aberdeenshire that show different dates, levels of vitrification and strategic locations. It is suggested that in the Aberdeenshire hillforts the vitrification derives from conspicuous consumption and competition

between communities, based on the extensive nature of the vitrification and that the sites were never refortified. In contrast the two examples from the City of Stirling have less extensive vitrification, occupy a highly strategic location and were refortified and thus the vitrification is argued to derive from enemy action.

As has previously been demonstrated, vitrification is neither chronologically nor geographically diagnostic. The same case should of course be made with regard to the impetus behind vitrification which varies across both time and geography: it can result from either enemy action or the inhabitant's own desires. Unpicking this, should not derive from whichever academic dogma is fashionable or current but rather from an analysis of the evidence, its context and comparison with other sites. However, the starting point is more data, which can only derive from more excavation.

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