Experimental Archaeology Conference

11th & 12th January 2012

Cardiff University
&
St Fagans: National History Museum
Experimental Archaeology Conference

PROVISONAL: Programme of Papers

Thursday
Welcome and pub social

Friday
Cardiff University

10.00 Aidan O’Sullivan: Irish Experimental Archaeology – A history (provisional title.)
10.20 Christopher Dobbs: Reconstructing the Cook’s Galley on the Mary Rose – From Seabed Rubble to Working Kitchen
10.40 Linda Hurcombe: Reconstructing A Bronze Age boat (provisional title)

11.00 BREAK

11.30 Christophe Snoeck: A Burning Question: Structural and Isotopic Studies of Cremated Bone in Archaeological Contexts.
11.50 Mike Charles, Glynis Jones, Emily Forster, Michael Wallace, Nick Fieller and Eleanor Stillman: Some like it hot: the effects of charring on crop remains.
12.10 Don O’Meara: Getting to the bottom of it: experimental approaches to archaeobotany.
12.30 Metin Erin: Were bifaces used as mobile cores by Clovis foragers in the North American Lower Great Lakes region? An archaeological test of experimentally-derived quantitative predictions

1pm LUNCH BREAK

2.00 Tine Schenck (UK) and Christian Horn (DE): Experiments with Hafting of Scandinavian Funnel Beaker flint halberds.
2.20 Stuart Page and Nada Khreisheh TBC
2.40 Adrian Wrona: The production of high carbon steel directly in bloomery process. Theoretical bases and metallographic analyses of the experiment results.
3.00 Weil Vander Mark, F. Bloema, A. Cool, M.S. van Hasselt, R. Knijpstra, M. Keereweer, E. Ijsveld, J.Rebergen, H.C. Fraza, J. Veldman: Surgery in the year 1350 AD
Reconstruction of medieval orthopaedic and dental treatment in Archeon, Alphen aan de Rijn, The Netherlands

3.20 BREAK

3.50 Gaynor Woods: Let’s Build a Kiln – Introducing Experimental Archaeology into the University Curriculum

4.10 Luc Doyon: Contribution of tool curation in the morphometric variability of Aurignacian projectile points made of antler.

4.30 Elizabeth Corey Lopez (UK): Experience as foundation for Experiment: A Practitioners Progress

4.40 Guerilla Archaeology: (TBC) Headresses and Outreach

5.00 Poster Session

Followed by drinks

Saturday

Oakdale Workmen’s Institute, St Fagans

9.30 Leave Cardiff by coach from the front of Cardiff Museum Main Building

10.00 Arrive at St Fagans

10.20 Welcome

10.30 Annelou van Gijn and Diederik Pomstra: Huize Horsterwold: a reconstruction of a Late Neolithic house plan from the Dutch wetlands.

10.50 Mary Ellen Crothers (UK): How warm was an Anglo-Saxon house? Testing reconstructed buildings and unravelling myths of Dark-Age discomfort: A case study at West Stow Anglo-Saxon Village.

11.10 TEA / COFFEE BREAK

11.40 Katrin Kania: Researching the Basics. Craftspersons as a “research tool” in an archaeological spinning experiment.

12.00 Heather Hopkins, Katrin Kania and Sabine Ringenberg: The influence of the dyers’ craft on experimental context: investigating the affect of metals in the dyeing industry of Pompeii.


12.40 Steve Burrow: Barrows, roundhouses and medieval courts: archaeological reconstructions at St Fagans National History Museum
1pm LUNCH BREAK

Saturday Afternoon
During the afternoon, delegates will be able to attend demonstrations by St Fagans’ miller, clog maker, weaver and Blacksmith, as well as by bronze casters from Parco Archaeologico e Museo all’aperto della Terremara di Montale, Italy. St Fagans National History Museum will also be open until 17:00 for those wishing to explore the castle, grounds and historic buildings which make up this award-winning attraction.

Conference Delegates will also be conducting demonstrations. These will be outlined soon.

5.00 Coach returns to Cardiff
Reconstructing the Cook’s Galley on the Mary Rose – From Seabed Rubble to Working Kitchen

Christopher Dobbs

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The Mary Rose Trust

During the underwater excavations of the Tudor warship Mary Rose, a large pile of rubble was discovered down in the hold of the ship. Shortly before raising the hull in 1982, the author was responsible for excavating this area and a small portion of the ships galley was found still intact at the bottom of this rubble. Later during the post-excavation analysis there was an opportunity to revisit the data and to reconstruct the brick galley on the basis of the archaeology carried out underwater.

At first a reconstruction was made on paper of the brickwork discovered in situ and this led to a paper reconstruction of the whole brick oven and hence the whole galley area. However a number of details remained elusive: how was the archway into the oven finished and was there a flue? To answer these and other questions and to better understand the structure, the author embarked on a series of projects of experimental archaeology – first building a 1:1 reconstruction of the oven and then performing cooking trials using an enormous replica of the cauldron. Wherever possible, replicas of objects found close to the galley were used in the experiments and the public were able to watch all stages of the work.

The result gives insights not just into how a galley was built and operated down in the hold of a Tudor warship, but also how they could have cooked basic meals for over 400 crew and specialised meals for the higher status officers.
Some like it hot: the effects of charring on crop remains

Mike Charles, Glynis Jones, Emily Forster, Michael Wallace, Nick Fieller and Eleanor Stillman

The preservation of plant remains by charring is one of the major sources of information regarding the economy and environment of the past. However, despite the importance of charring to archaeobotanical research, the conditions that led to preservation of plant material recovered from archaeological sites, and the effects of charring processes on the remains themselves are poorly understood. For example seed size may relate to growing conditions and/or genetic diversity between or within plant populations, but the measurement of charred seeds is of limited utility if the biases and morphological changes caused by charring are not taken into account. To address these issues a series of experiments was designed to test the impact of different charring regimes on modern grains of emmer (Triticum dicoccum). Grains were charred in anaerobic conditions, with the variables altered being temperature and duration of heating. Simple measurements (e.g. length and breadth) were complemented with more sophisticated computer-aided morphometric analyses. Grains were photographed before and after charring, facilitating one-to-one comparison of grain appearance, size, mass and morphology. Grains from each experiment were also cross-sectioned and examined under both a high-powered light microscope and a scanning electron microscope, to examine the effect of different heating regimes on the internal structure of the grain.

Previous attempts to establish the minimum temperature at which crop plant remains would be charred sufficiently to survive within the archaeological record (e.g. Braadbaart and van Bergen 2005; Braadbaart 2008) concentrated on the apparent degree of carbonisation during relatively short periods of heating (with a maximum duration of two hours), but failed to account for drastic differences between the appearance of grain charred experimentally and that typically recovered from archaeological sites. Using the techniques outlined above, we believe we have identified a fairly narrow range of temperatures and durations of charring that produce emmer grain comparable to that which archaeobotanists would consider to be ‘well-preserved’. Having established the impact of different charring regimes on plant material, it is possible to estimate the degree of distortion to which archaeobotanical remains were subjected during the charring process.


Barrows, roundhouses and medieval courts: archaeological reconstructions at St Fagans National History Museum
Steve Burrow

National Museums of Wales

In August 2012 St Fagans began work on a £25.5 million redevelopment project. Groundworks have already begun and over the next five years we will be making major changes to the facilities and layout of the museum. Central to this project is the incorporation of Wales's archaeological stories into St Fagans galleries and grounds.

This paper will outline the future of archaeology at St Fagans, with a particular focus on three major building projects which will allow visitors to explore the Bronze Age, Iron Age and medieval periods in new ways.

The relationship between these projects and the wider European tradition of archaeological open-air museums (as championed by EXARC, www.exarc.net) will also be discussed."


All Archeon/Alphen aan de Rijn/The Netherlands employers

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In the medieval house of the surgeon Archeon demonstrates to visitors the theory and practice of medicine in the year 1350. We explain the doctrine of the Four Elements, the ancient system of internal medicine. Medieval surgeons had many surprising skills and methods in treating people with different sorts of injuries and trauma.

Two medical treatments are interesting to reconstruct:
- Treatment of open femur fracture
- Treating holes in the teeth using a heated small pipe and pricker.

The project is a craftsmen partnership. The goal of this team is to unlock and reconstruct these treatments based on a manuscript from the fourteenth Century. We will discuss this source and describe the process and its outcome. Main source is the study by the Dutch professor Dr. E.C. van Leersum “The book of SURGERY” written by the Flemish surgeon Jan Yperman. Yperman described his knowledge and experiences of surgical practice. He dedicated his work to his son. We will make a study of the original texts, translate it in present-day Dutch and make interpretations if necessary and motivate. The process of the reconstruction and the treatment will be photographed and filmed.

With the reconstruction of two medieval surgical treatments, we will make a historically accurate new performance. This will increase knowledge and insight of our visitors. By writing two articles in English we will transfer our experience and the opinion of modern physicians to the other European open-air museums.
Evaluating Knapping Skill and Exploring the Cultural Transmission of Lithic Artefact Traditions.

Stuart Page and Nada Khreishneh

This joint paper presents two main research strands. Firstly it outlines a process for evaluating skill acquisition, by defining the difference between cognitively understanding knapping concepts and possessing the physical ability to actually execute them. This is achieved by training a group of volunteers to produce experimentally knapped examples of different lithic tool types and evaluating their performance. The second strand explains how the use of multi-generational transmission chains, often used in psychology, to explore the evolution of artefact form, can provide an experimental, Darwinian framework for the examination of how skill, copying error and social transmission strategies may have influenced the evolution of Palaeolithic technology. Using contemporary flint knappers, the first experiment focuses on blade technology; the remaining three experiments examine how the above factors likely impacted on Achuelean handaxe form. This paper presents findings from a completed study on blade technology and also reports progress to date on experiments being conducted on the manufacture of Acheulean handaxe forms. This is the first time this psychological methodology has been applied to an archaeologically attested technology such as flint knapping. Used in an experimental setting, it provides a controlled environment in which to examine how micro-evolutionary aspects of the knapping process may have possessed the potential to create different evolutionary trajectories in lithic artifact form.
Let’s Build a Kiln – Introducing Experimental Archaeology into the University Curriculum

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This paper discusses a small project based on the reconstruction of a fourteenth century tile kiln. It hopes to initiate discussion about how we can use reconstruction and experimental projects to inspire the next generation of archaeologists and craftspeople, and to work towards further collaboration and sharing of knowledge between these different groups. This experiment repeated a similar experiment undertaken at Norton Priory Museum, Cheshire in the 1970’s. However this project was primarily designed as a learning experience for students, to explore the impact that planning, researching and managing the project had on them, discovering what the students thought that they learned about the process of replicative experiments, and about their ideas on working together with skilled craftspeople, museum workers and archaeologists.

The kiln was successfully fired and our design tested, with ideas and comments put forward from the archaeologists and ceramicists for new repairs and changes to the design. Both student groups worked well together and shared ideas based on their own subject experience and research, developing skills in project management, co-operative working and communication.

This project challenged and stretched these undergraduate students, introduced them to the practice and concepts of experimental archaeology and inspired their confidence to undertake this type of experimentation. I hope they also learned that experimental work is not just the tool of the “professional” archaeologist but that skilled craftspeople also have much to add to the process.
Contribution of tool curation in the morphometric variability of Aurignacian projectile points made of antler

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In the last two decades, the study of prehistoric technologies has relied on the concept of the “chaîne opératoire” (production sequence) developed by the anthropologist Pierre Lemonnier (1976). The use of this concept has provided archaeologists with a better understanding of the interactions between human agents and the raw materials they transformed.

Aurignacian technology is of particular interest to prehistorians tracing the evolutionary history of the genus Homo. Conceived as an allochthonous cultural entity associated with the arrival of Homo sapiens in Europe, the Aurignacian toolkit is distinguished by the standardization of its armatures used for composite technologies. The widespread adoption of blade production, the uniformity of the lithic blanks produced are two characteristics of Aurignacian technology used by Mellars (1996) to contrast with the Middle Palaeolithic toolkits. Mellars hypothesized that the standardization of material culture denotes important cognitive and cultural changes in anatomically modern populations. However, for projectile technologies made of antler, Knecht (1991, 1997) shows that despite the apparent morphological standardization, part of the metric variability remains to be explained.

This paper is aimed at understanding the contribution of tool curation in the morphometric variability of Aurignacian projectile points made of antler. Experimental and experiential approaches in archaeology are combined in order to identify the natural and cultural sources of variability in the techno-economic scheme of transformation and production of osseous technology. A functional analysis was conducted to identify trends related to types of use-wear, damage and breakage. This approach enables the qualification and quantification of tool repair and curation in the morphometric variability of Aurignacian bone technology and, in turn, allows us to test the degree of standardisation in its production.

A special focus will be directed on identifying the various constraints acting on the mental and cultural templates during the production sequence and their consequences on artefact standardization (Eerkens 2000; Eerkens & Bettinger 2001; Eerkens & Lipo 2005). The experimental results also allow us to reflect upon the cultural transmission of innovation and the relationship between material culture and action through the embodiment of culture and the corporal translation of knowledge (Ingold 2002; Leroi-Gourhan 1964).
Bibliography


Were bifaces used as mobile cores by Clovis foragers in the North American Lower Great Lakes region? An archaeological test of experimentally-derived quantitative predictions

Eren Metin

The notion that Paleoindians used bifaces as “mobile cores” is widespread in Late Pleistocene lithic research, although it can be difficult to test empirically. Here, we use experimental replication to establish two quantitative predictions that would be indicative of biface-core transport. If bifaces are being used as mobile cores, then we should see among a group of sites of varying toolstone procurement distances (a) a negative relationship between toolstone procurement distance and the mean unifacial tool maximum-thickness value from each site; and (b) a negative relationship between toolstone procurement distance and the variability (standard deviation) of maximum flake thickness values from each site. We then test our these predictions against data from six Clovis sites of varying toolstone procurement distance in the Lower Great Lakes region. The results show that both predictions possess a positive, statistically significant relationship with increasing toolstone procurement distance, which is inconsistent with the notion that biface-cores were transported. Since the Clovis presence in the Lower Great Lakes is widely acknowledged to be a colonization pulse, we conclude that the lack of biface-core transport there is an economizing and risk-mitigating behavior consistent with the models of Kuhn (1994) and Meltzer (2002, 2003, 2004).
How warm was an Anglo-Saxon house? Testing reconstructed buildings and unravelling myths of Dark-Age discomfort: A case study at West Stow Anglo-Saxon Village.

Mary Ellen Crothers

West Stow Anglo-Saxon Village.

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It has long been assumed that Anglo-Saxon Sunken Featured Buildings had pits underneath the floors of their living spaces to maintain heat within the house above, particularly at night and that the Hall buildings did not have pits beneath because they were not used as domestic spaces. Re-enactors’ experiences, perceptions and understanding of Anglo-Saxon living at West Stow vary considerably and are often based on comparisons between this and their modern-day lives.

For experimental archaeology, awareness of subjective comfort is important but objective measurement is needed to avoid making value judgements on Anglo-Saxon lifestyle. Temperature and relative humidity were measured inside the reconstructed buildings and the pits below. The fluctuations between cold/wet and hot/dry margins were evaluated against other variables such as outside temperature, domestic activities and hearths. The aim of the tests was to determine if and how activity and weather affect temperature readings within each of the buildings. The findings have shown that the pit does not play the critical role that was once held firm and alternative explanations for them must now be sought.
Huize Horsterwold: a reconstruction of a Late Neolithic house plan from the Dutch wetlands

Annelou van Gijn and Diederik Pomstra

In the summer of 2012 archaeology students of Leiden University, volunteers, employees of the State Forestry Service of the Horsterwold and three ‘prehistoric architects’ joined forces to build a reconstruction of a house plan excavated at Heemstede-Brabers (province of Zeeland), dating to the Late Neolithic Vlaardingen period (c. 2500 cal BC). Use was made of Stone Age tools only and the house was built with materials deriving from the direct surroundings. The objective was to document and quantify every step of the building process, to monitor the number of hours worked with the various stone, flint, bone and antler tools and to quantify the building materials. We also monitored the differences in carrying out the various building tasks between the experienced architects and the apprentices. A biography was made for each tool used and eventually all implements (and the casts made at various intervals) will be examined for traces of use. The house will serve as a basis for nature walks organized by the Forestry Service and for scientific experiments by students and staff of Leiden University. Volunteers will continue to actively participate by using the house for various, experiential, activities. In this paper a short summary of the building process and a critical evaluation of the choices made will be presented, as well as some preliminary findings regarding tool use and raw materials.
The production of high carbon steel directly in bloomery process. Theoretical bases and metallographic analyses of the experiment results

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The problem of steel making in antiquity has been intriguing the researchers who specialize in the ancient metallurgy for decades. In the course of research different explanations prevailed in the scholarship. Recent experiments of the iron smelting clearly shows that the same mechanism like in the carburizing in so-called “Aristotle furnace” may occur in appropriate conditions during the smelting operation. It is basically the same operation as the one described by O. Evenstad and Japanese oroshigane process. This consists of a superficial melting of iron fraction situated near the tuyere, which actually became a cast iron and formed a multilayer clot with varied carbon content after falling to the furnace bottom. Then, in high temperature, the carbon from eutectic structures diffuses to the surrounding areas and increases carburization degree in the whole cross-section of bloom. Steel with a high carbon content were obtained during two smelting operations performed in recent year. The occurrence of the above process may be confirmed by the presence of the eutectic structures on the surface of iron parts which did not integrate with the proper bloom. The results of the metallographic studies will be presented as well as the description of the conducted experiments. Author is also going to discuss a further questions and problems related to the topic.
Getting to the bottom of it: experimental approaches to archaeobotany

Don O’Meara

Durham University

Replicative experiments have played an important role in the archaeological understanding of fields such as artefact production and building construction (and destruction). However, the role of experimentation in the field of archaeological examinations of diet has often limited itself to issues surrounding food processing as evidence from the frequency of experiments on the effects of butchery on bone, or on the charring of plant remains. These studies have provided valuable information regarding how the archaeological record of food remains has been biased, however, it is also important to realise these experiments concern aspects of the archaeological record that may never pass through the human digestive tracts (i.e. charred remains and large mammal bones).

The understanding of the physical and chemical process of human digestion and the possible effect this may have on the archaeological record has been little explored however. This paper focuses on the post-grad research of the author in his examination of the importance of experimental approaches to digestive taphonomy. This paper will discuss the research and experiments conducted by the author on mastication and full digestion on certain plant remains, (in the tradition of experiments such as those of AKG Jones on fish remains). These have been undertaken in the context of an examination of latrine/cesspit remains from sites in Northern England.
A Burning Question: Structural and Isotopic Studies of Cremated Bone in Archaeological Contexts

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Of the various burial practices used by humans, cremation is one of the most common; both nowadays and historically. Since 2001, cremated bone fragments are radiocarbon dated and much research has been carried out to try and understand why cremated bone provides reliable radiocarbon dates. Many bone fragments have been burned in controlled laboratory conditions but only few have been burned on outdoor pyres.

In order to study and understand cremated bone, it is crucial to burn bone in real environmental conditions. As part of my doctoral research, several outdoor cremations have been carried out using wood and coal. Different animal bones were burned, including lamb, pig, cow, and fish. The cremated fragments have been analysed by Fourier Transform Infrared Spectroscopy (FTIR) to observe structural and compositional changes. Some have been radiocarbon dated and carbon isotopic ratios (δ13C) have been measured by Mass Spectrometry (MS).

In the proposed paper, I present the first results of this research. Experiments show that very high temperatures (above 900ºC) can be achieved in outdoor conditions but that it is difficult to reach full calcination of bone: some parts will be white (calcined) while others will remain black (charred). Preliminary results indicate that bone structure changes drastically after cremation, and that bone exchanges large amounts of carbon with its surrounding environment during cremation: burned with coal, a modern lamb bone appeared to be 4,000 14C years old. The paper proposes some implications of these results on radiocarbon dating and bioarchaeology.
The goal of this proposal is to bolster a centre of experimental archaeology, an association dedicated to research on the Iron Age Iberian Culture (Protohistory), that intends to reach out to both the educational system and the general public. With this goal in mind, a centre of experimental archaeology (CEP) is being established on a plot of land owned by the town council of Verdú (l'Urgell). This land is adjacent to the archaeological site of Els Estinclells, a settlement of the ancient Iberian Ilergetes tribe. The fact that this site is almost totally excavated and that its features have been consolidated and are in the process of museological valorisation, increases both its scientific and social potential.

The two most significant lines of this proposal are therefore the programme of scientific archaeological experimentation and the pedagogical potential, in a close collaboration with local and regional organisms:

1. The first is a pilot project dedicated to Protohistory, in particular the ancient Iberian Culture, that is already in place (master plan in 2010 and sub-projects carried out in 2011). The project, nonetheless, requires a final definite thrust. One of its most innovative aspects of this proposal on the scientific level is the strategy to integrate several different spheres of experimental archaeology.

(a) agriculture and archaeobotany: this line of research focuses on the reconstruction of the ancient agricultural system of the Iberian culture, based on the three main productions found on archaeological sites in the area: cereals, grapevine and olives.

(b) Protohistorical building systems: this aspect is based primarily on the construction from scratch of buildings to shelter the future wine or oil presses. These building will be attached to a segment of the city rampart which will also be erected.

(c) pottery production: the idea of this sub-project is to rebuild the different parts of pottery kilns so as to grasp the ancient construction techniques. A replica of a large pottery kiln based on the « Casa Grande » at the site of Alcala de Xúcar is currently being reconstructed. Other smaller kilns are also planned based on the structures of the site of Pontons (Alt Penedès).
The Worked Bone from the Links of Noltland

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Containing a rich and diverse range of archaeological remains, the Links of Noltland, a 2.5 hectare site situated on the exposed north coast of the island of Westray, represents one of the most complete early prehistoric sites yet found in Orkney. Recent excavations on a large Neolithic structural complex and associated field systems located on an elevated ridge to the south east corner of the site and a Bronze Age settlement and contemporary burials to the south west. This work has produced a wealth of artefacts, including decorated Neolithic grooved ware pottery, Bronze Age steatite vessels, flint tools and items made of stone and bone. Three small Neolithic figurines, the oldest to be found in Scotland, and an unusual building with cattle skulls placed within the wall foundations have also been discovered. One of the key factors which make the Links of Noltland so important is the high quality of bone preservation. Since 2007, over 1,500 items of worked bone have been recovered, including mattocks, awls, points, polished pins and beads together with bone working debris. The scope offered by the extended chronology of the site and by such a complete and well preserved assemblage offers a level of interpretation rarely matched. It is hoped that detailed analysis will allow us to identify how and where bone materials were sourced, objects manufactured, used and discarded and how worked bone technology changed through the lifespan of the site. Together with the other finds from the Links of Noltland we hope to gain a more fully rounded picture of the prehistoric tool assemblage, economy, diet and environment.
Copper Plus Tin Plus People: Public Co-smelting Experimentation in Northwestern Iberia.

Aaron Lackinger¹, Beatriz Comendaro¹, Elin Figueredo², M. Fátima Araújo², Rui Silva³, Salvador Rovira⁴

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The reconstruction of the chaîne opératoire of prehistoric tin bronzes from the north-western Iberian Peninsula has been discussed mainly based on theoretical proposals. In recent times some relevant information based on the analytical study of the archaeological contexts of production has given some new insights on the subject.

We have made an initial experimental approach of one of the proposed models for obtaining bronze, the co-reduction of copper and tin ores. One of the main aims was to gain knowledge, through experimental methods, about the chaîne opératoire of bronze production in north-west peninsular prehistory – an area where signs of early metallurgical production have long been well-known.

The development of this initial experiment turns around had a series of aims, namely:
• The realization of a co-reduction experiment associated with a specific chronological moment and geographical area, using minerals originating in the north-west of the Iberian Peninsula.
• The empirical corroboration of theoretical proposals from archaeological evidences.
• Analytical studies of the smelting products, such as metallic prills, slags and others, to infer about the success of the experiment and obtain data for future comparison with archaeological evidence.
• Full development of educational and outreach potential within the process of knowledge transfer, by the conversion of the experiment into a public experience. This involved the participation of diverse implicated discourses (craftwork, chemistry, archaeology).

In this poster we present an initial approximation of the results of the experimental co-reduction which will serve as a foundation for new proposals and projects.
From Wax to Metal: An experimental Approach to the Chaîne Opératoire of the Bronze Disk from Urdiñeira

Aaron Lackinger and Beatriz Comendador,

GEAAT, Universidade de Vigo

The so-called “Treasure of A Urdiñeira” (A Gudiña, SE of the province of Ourense, Spain) consists of an assemblage of three metal artefacts: two gold bracelets and a bronze button or disk, dated from the transition between the Late Bronze Age and the Early Iron Age. This hoard found by chance around 1921, combines sumptuary objects made of gold and bronze, which are not usually found together in the context of the Iberian Peninsula (Comendador & Lackinger 2012).

From a morphological and technical point of view, the gold objects were well studied by B. Armbruster (2000), who indicates that the closed bracelet was made by a lost-wax process and with the use of a lathe, and includes them in the Villena/Estremoz technological domain system, from the Late European Bronze Age. Despite its singularity, the bronze object has received less attention than the gold objects, except from the typological point of view.

Based on direct observation and the analyses made on the archaeological material (SEM), we can establish a hypothesis about its manufacture and we propose an experimental approach to the chaîne opératoire of the disk from Urdiñeira. Our proposal revalues the NW Iberian Peninsula artisans' community knowledge, as it suggests an experimental recreation of the chaîne opératoire with recourse to certain technical uses by these artisans. We aim to test coherent experimental processes and formulate precise questions related to prehistoric technologies.


Acorn bread in Iron Age of NW Iberia. From gathering to baking.

Estevo Amado

Study Group for the Prehistory of NW Iberia - University of Santiago de Compostela (GEPN-USC)

Strabo's Geography is one of the main sources that archaeologists use for the study of the Castro Culture customs on food and consumption. Diet has an important place in their descriptions, where Strabo affirms that during two thirds of the year, those mountaineers fed on the acorn. The archaeological evidence shows that these people were mainly farmers; therefore Strabo presents this idea of gathering and poor agriculture trying to emphasize a civilizing image of Rome. However, the gathered products would constitute an important part of their diet, as the common finding of acorns on an important number of settlements seems to indicate. Acorn bread has occupied an important place in our work on food and consumption in the Northwestern Iberian Iron Age, being one of the first operational chains that we have investigated and reconstructed through experimental archaeology, paying particular attention to the final steps of this process, such as the extraction of tannins, the grinding with stone mills, and the different cooking methods depending on structures and artefacts.

Methods of drilling holes in prehistoric artefacts made of antler – an experimental and use-wear study.

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The occurrence of antler artefacts on prehistoric European archaeological sites is one of the most interesting evidence of highly developer manufacturing system in these times. Such products as tools, weapons and ornaments are often an indicator of certain specific cultural traditions. Among the wide range of different categories of such artefacts, especially interesting, on account of the way of production, tend to be those with characteristic, large (greater than 1 cm) holes. Upper Palaeolithic perforated batons, different kinds of mesolithic hammer adzes or neolithic T-shaped axes were an inspiration to take up the subject associated with the process of making such kind of holes. The main goal of presented experimental program was to verify previous theories and determines related to the presented subject. For this purpose, a series of experiments were carried out with different techniques and tools that could be used by our ancestors.
Living conditions and indoor air quality in a reconstructed Viking house

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How harmful to a person’s health were the indoor conditions in Danish Viking Age houses? We do not have much direct evidence describing that, but we know that currently exposure to smoke from the solid fuel used for cooking and heating in open fireplaces in Third World homes is to blame for about 1.6 million deaths annually, and accounts for about 3\% of the global burden of diseases, mainly for women and children.

During the winter of 2011-2012, a study was conducted in two Danish reconstructions of the ”Hedeby House” (870 AD): for five weeks in October-November at Moesgaard Museum, and for ten weeks in February-April at Bork Viking Harbour. The houses were inhabited by volunteers with living conditions matching as closely as possible our knowledge of life in the Viking Age. During the study, the thermal environment and indoor air quality were monitored.

Heating and cooking were in average maintained by a daily fuel consumption of 50 kg hardwood. The mean temperature was 15-18°C inside the two houses, while the outdoor mean temperature was 10°C lower. The indoor temperature distribution was, however, very asymmetric and dominated by radiant heat, which we will show on the poster by infrared images.

The air quality was dominated by wood combustion products, with daily levels of fine particles on the order of 0.80 – 3.4 mg/m\textsuperscript{3}. Carbon monoxide was in the range of 5.5-22 ppm (mean conc.). The study is the subject of a master’s thesis by one of the authors (Christensen, expected 2013).
Research carried out at the KNH Centre for Biomedical Egyptology using clinical imaging techniques has identified evidence of the methods used by the ancient Egyptians in the mummification of animals as votive offerings. These findings, particularly in the case of avian mummies, suggest that, at least for the most part, the animals were not eviscerated, nor were the feathers removed. The ritual anointment of the body through the use of resinous substances appears to have played a considerable role in preservation, along with the use of natron to desiccate the tissues as has been identified in the microscopic analysis of mummies studied to date. The ritual anointment of the body through the use of resinous substances appears to have played a considerable role in preservation, along with the use of natron which has been identified on linen wrappings using Environmental Scanning Electron Microscopy (ESEM) and Energy Diffraction X-ray (EDX) analyses. Previous research concerning avian mummification using experimental techniques has focused on bird species commonly treated as victual (food) mummies (e.g. ducks) rather than birds of prey, which are commonly witnessed in the archaeological record (e.g. Sparrowhawks and Kestrels). In addition, they have employed those techniques found in classical literature, and those which pertain to human mummification.

The experimental mummification of a female Sparrowhawk obtained from the Natural History Museum, Tring was undertaken with stringent radiographic analysis (X-ray and CT) both prior to treatment, immediately after treatment, and at regular intervals thereafter to assess the state of preservation achieved by the processes observed in ancient specimens. The preliminary results of the experiment will form the basis of this presentation.
From Mead to Snakebite: An ethnographic study of modern British University sports team drinking culture and its parallels with Viking drinking rituals and consumption

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In this paper modern British University sports team drinking culture is used as an analogy to understand patterns of Viking-Age alcohol consumption in an attempt to bring the archaeology to life and engage a wider community through the medium of humorous modern comparison. Observations are made from the author’s own experiences working in a student bar and compared with Viking-Age archaeological and literary evidence to identify similarities between modern and ancient patterns of alcohol consumption. Particular emphasis is placed on the role of rituals in fostering group identity, encouraging a collective ideology and enhancing the enjoyment gained from drinking.

‘Hut&Fire’: an ongoing experimental project in Sicily

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Aim of the project ‘Hut&Fire’ is the reconstruction of a Bronze Age hut, using techniques, methods and raw materials consistent with knowledges acquired by the excavation of the site of Case Bastione (Villarosa, Enna) and other known Sicilian and South Italian archaeological contexts. This kind of experiences are quite innovative in Sicily where, except from didactic activities, experimental archaeology is not much practised. Preliminary steps have been: the study of similar projects in making and using prehistoric and proto-historic tools and huts building; the close examination of bibliography about Bronze Age structural remains and of paleoenvironmental data. The following phase of the project, still in process, concerns the collection of raw materials and making of tools and architectonic hut elements. Afterwards, we will proceed in building one or more scale models of the hut in order to test techniques, static solidarity and the possible variants of the structure. Finally, the hut will be set up and then burnt, with the purpose of a future stratigraphic excavation and documentation of the hut remains. The results of this experience will be useful to enrich the knowledge about Sicilian prehistoric material culture. One of the most important goals of the project is the widest diffusion of data collected among scholars (scientific publications) and non-specialist public: every step are being recorded, by photos and videos as well, and progressively shared on a website and social networks.
Cooking pots or cooking with pots? Experiments with Iron Age portable baking chambers of NW Iberia

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Portable ceramic firing/baking chambers have been found in fifteen Iron Age and Roman period sites in the northwest of the Iberian Peninsula. They are circular in plan with a diameter ranging from 55–65cm. Their fabric is poorly tempered, often quite roughly finished, with only one decorated example discovered so far. In the archaeological literature they are referred to as “Castromao ovens” and can be comprised of two pieces, a lower grill with various perforations into which a cover can fit. Abundant soot deposits on the base and interiors of some examples indicate that they were exposed to fire. These ovens, with some variations in form, have parallels from the Bronze Age in Western Europe.

One of the main difficulties in defining the functionality of these objects is the scarcity of contexts related to their use. They often appear dispersed or integrated in anthropic deposits alongside very heterogeneous material. So far only grill fragments have been found wedged between the stones of hearths within two house structures. Another factor is the high rate of fragmentation and poor conservation of pieces, a consequence of insufficient firing in many cases, which impedes the correct reconstruction of the oven.

Until now various functions have been attributed to these objects. Some authors suggest that they were used as pottery kilns, while others link them to the preparation of food (e.g. domestic ovens, stoves, driers, smokers), with a third hypothesis proposing that they are connected with metallurgical activity.

In order to assess the viability of these different interpretations, experiments were undertaken using a replica of a “Castromao oven”. The collaboration of a traditional potter in the construction of the oven added an ethnoarchaeological perspective to the experiment. During firing the oven was subjected to temperatures that reached around 700-800ºC in order to successfully fire the pottery. Once this step was completed, the oven was then used to prepare various types of food, trying different forms of providing heat. In these experiments the marks left by each process were taken into account, along with its impact on the oven. Preliminary results showed that the hypotheses suggesting that these chambers were used for the firing of pottery, and for food preparation are both viable, suggesting that this general morphotype could have been used for both. For future interpretations of these objects, the analysis of their surfaces and use-related marks, along with their archaeological contexts, should provide data as to their exact function.
Researching the Basics. Craftspersons as a “research tool” in an archaeological spinning experiment

Katrin Kania

(keywords: spinning, hand-spindle)

Questions in experimental archaeology are often connected to specific crafts processes – which is a serious problem in regard to both objectivity and repeatability of an experiment. Different skill levels, talents, and changing fitness levels may influence the outcome of a crafts-related experiment considerably. On the other hand, those influences did also exist during historical crafts processes, and knowing about them is beneficial to the research and evaluation of historical crafts. While it is possible to take the human element out of the equation in some cases, crafts like hand-spinning do not allow for this. Thus, an approach is needed that both uses the individual persons’ skills and experience while at the same time gives an indication of how strongly the individual person influences the outcome. The spinning experiment presented here was designed to do this by isolating the possible influencing factors spindle weight, spindle MI (moment of inertia), fibre and spinner through a setup with specially designed spindles and a large number of participants. For the first time, a large number of spinners - fourteen persons - worked under identical circumstances and with identical material.

This large-scale experiment resulted in a dataset that allows an estimation of how much influence the craftsperson had on the resulting yarn. It shows one possible method of designing a crafts-related experiment that is both repeatable and expandable using the toolset developed. This could lead to both a larger database and even better insights into the individual influence of the crafter working with historical methods today.
Where were the Viking Brew Houses?

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There is no doubt that the Vikings drank Ale - it is written about extensively in the Sagas. Nor is there any doubt about what the Ale was made from - malt. So, where was the Ale being made? We have identified the Viking Brew Houses at a number of well known sites. Some of these facilities have been misinterpreted as saunas or bath houses, simply because of the presence of drains and fire cracked rocks. Others have been interpreted as dairying facilities, or as sheep or goat barns.

All the products and by products of brewing ale are ephemeral and leave no trace in the archaeological record. The Ale is drunk, the draff or spent grain is fed to the animals and residues are washed down the drains. All that is left is the equipment and installations and, in order to recognise these in context, it is essential to know how to make ale from the grain. This is something which few people do nowadays, but it is an ancient and traditional craft that has changed very little over the millennia.

Merryn has been investigating ancient and traditional malting and ale-making techniques for the past 15 years. Graham has 30 years' experience as a craft brewer and it is this knowledge, as well as an understanding of the necessary facilities and installations that any brewer requires, that has enabled us to identify the Brew Houses at a number of Viking sites. Over the last two years, we have been visiting some of the best preserved Viking settlements in the UK, including Jarlshof, Shetland, the Brough of Birsay on Mainland Orkney and Cubbie Roo's Castle, Wyre. We have also been studying the excavation reports of a number of sites, such as Stong, Iceland, and several sites in Caithness and Sutherland. Once the relevance of fire cracked rocks, drains and large vats is realised, then the identification of ale making facilities is obvious.
The goal of this proposal is to bolster a centre of experimental archaeology, an association dedicated to research on the Iron Age Iberian Culture (Protohistory), that intends to reach out to both the educational system and the general public. With this goal in mind, a centre of experimental archaeology (CEP) is being established on a plot of land owned by the town council of Verdú (l'Urgell). This land is adjacent to the archaeological site of Els Estinclells, a settlement of the ancient Iberian Ilergetes tribe. The fact that this site is almost totally excavated and that its features have been consolidated and are in the process of museological valorisation, increases both its scientific and social potential.

The two most significant lines of this proposal are therefore the programme of scientific archaeological experimentation and the pedagogical potential, in a close collaboration with local and regional organisms:

1. The first is a pilot project dedicated to Protohistory, in particular the ancient Iberian Culture, that is already in place (master plan in 2010 and sub-projects carried out in 2011). The project, nonetheless, requires a final definite thrust. One of its most innovative aspects of this proposal on the scientific level is the strategy to integrate several different spheres of experimental archaeology.
   (a) agriculture and archaeobotany: this line of research focuses on the reconstruction of the ancient agricultural system of the Iberian culture, based on the three main productions found on archaeological sites in the area: cereals, grapevine and olives.
   (b) Protohistorical building systems: this aspect is based primarily on the construction from scratch of buildings to shelter the future wine or oil presses. These building will be attached to a segment of the city rampart which will also be erected.
   (c) pottery production: the idea of this sub-project is to rebuild the different parts of pottery kilns so as to grasp the ancient construction techniques. A replica of a large pottery kiln based on the « Casa Grande » at the site of Alcalá de Xúcar is currently being reconstructed. Other smaller kilns are also planned based on the structures of the site of Pontons (Alt Penedès).
An Experimental Investigation into the Clovis Snapped Blade Technology

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This poster presents the results of an experiment which attempted to cast some light on the purpose of notches, and how breaks were initiated on snapped Clovis blades from the Gault site, central Texas. The experimental aspect focused on three methods, and used porcelain blades made by Professor Bradley, University of Exeter rather than the original blade material of chert.

The experimental results of this project were that of the methods used, method 1 (which used a wooden rig to support the blades while a stick was pushed down over the notches to break the blade) and method 2 (which used a split stick to break the blades) produce results most similar to those seen in the Clovis snapped blade technology, but that further work needs to be undertaken with stricter methodological controls to produce a firmer conclusion. This may shed some light on the possible organic artefacts used by Clovis people that are not often found archaeologically.
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