

## 1. Ertebølle Cuisine: A Freshwater Radiocarbon Reservoir Effect in Mesolithic Food Crusts from Northern Germany

Bente Philippsen and Jan Heinemeier

Pottery was a remarkable innovation for the Terminal Mesolithic Ertebølle society of southern Scandinavia: boiling in vessels over direct heat made food resources available which could not otherwise be digested, while preserving all nutrients in liquid foodstuffs. Did this innovation occur contemporaneously throughout northern Germany, or were inland groups some hundreds of years ahead of those at the coast? Reliable dating is an important precondition for identifying the origin of pottery, as it has to be known which other cultural groups were contemporaneous with the Ertebølle culture.

$^{14}\text{C}$ -dating of pottery uses charred food remains (“food crusts”) that are frequently found on Ertebølle pottery. There is one considerable source of error, though: the presence of freshwater food can result in radiocarbon ages that are too high. Freshwater systems with hard water, a high content of dissolved minerals, contain considerable amounts of “ $^{14}\text{C}$ -dead” carbon. Those minerals originate from carbonate rocks, having infinite ages compared to the  $^{14}\text{C}$  time scale. This effect is called the “hardwater effect”. A recently caught fish, for example, was found to have a radiocarbon age of more than 2,000 years.

Thus the question of what Ertebølle people cooked in their pots is not only interesting in itself, but also helps in finding out whether radiocarbon dating is affected by the hardwater effect. I used the stable isotopes of carbon and nitrogen,  $^{13}\text{C}$  and  $^{15}\text{N}$ , to identify the foodstuffs that formed the crust. Experiments with copies of Stone Age vessels were conducted to test the reliability of the method: was it possible to retrieve the recipe of a food crust by stable isotope measurements? If a fish has a high reservoir age, is the same reservoir age found in the food crust made from this fish?

In addition to recent materials, I examined archaeological remains from the two inland sites Kayhude and Schlamersdorf, where the potentially oldest Ertebølle pottery is believed to have been found. The fact that this pottery was much older than pottery from coastal Ertebølle sites, combined with the sites being located close to freshwater rivers, aroused suspicion: is the oldest Ertebølle pottery really that old? Measurements of food crusts, terrestrial and fluvial samples from the same context gave the answer.

## 2. Fun and Feasting: Contextualising the Animal Remains from the Kabeirion at Thebes

Kirsten Bedigan

The animal remains from the sanctuary of Kabeiroi near Thebes present a small but relatively comprehensive corpus of material from a single ritual complex occupied from the 6th century BC until the 4th century AD. The presentation of this material in isolation from the rest of the sanctuary excavations means that

the remains have been deprived of their context (Boessneck 1973). The material comprises two overlapping categories, with pieces being used specifically as votives or as the by-product of food consumption interred in votive deposits at the sanctuary.

The votive animal remains comprise anklebones (*astralogoï*), used as gaming pieces. These are presumably dedicated, along with other examples of toys and youth-associated votives, to the divinity at the sanctuary known as Pais, literally translated as the 'child' (Bedigan 2008, 123). The other animal remains reflect the consumption practices at the sanctuary. Numerous vases depict the hunting of deer or the sacrificing of cattle, sheep and swine to the deities Kabeiros and Hermes (Bedigan 2008, 248-249, 268-271).

Schachter (1986, 108 n.1) notes that the majority of the animal remains were located within a 'sacrificial pit' to the west of the site. Whilst he correctly asserts that sheep and goats comprised the largest type of bone, the high number of *astralogoï* and his lack of distinction between votives and food remains suggests that the animal bone assemblage can repay closer study.

This paper will discuss the animal remains from food consumption at the site and re-contextualise them with reference to the architecture and topography of the sanctuary itself, and the other votive offerings.

### 3. Splitting Hares! Investigating Anthropogenic Modification Signatures on Leporid Bones, using Actualistic Experiments to Improve Identifying Small Mammal Exploitation by Humans

Wendy Howard

Small mammal remains within archaeological deposits often present a problem to archaeologists. Aside from the issue of recovering small bones, there is the problem of accurately identifying whether their deposition was due to human activity, rather than other natural agencies. While butchery marks or burning are useful indicators of anthropogenic utilisation, such evidence is often lacking on small mammal bones. What is needed is a better methodology to accurately identify human utilisation of these smaller species.

This paper describes one approach to improving such identification, by exploring the potential effects of cooking and dismemberment practices on leporid bones through actualistic experimentation. Raw and cooked (pit- and spit-roasted) rabbit carcasses (used as a proxy for small mammals) were subjected to disarticulation by linear hyperextension and twisting of the joints, with the bones subsequently examined macro- and microscopically. The results demonstrate that the above traumatic processes produce few changes visible on bones, and those present are subtle. One example demonstrated here is the spalling of bone off the ulnar anconeal process with hyperextension of the elbow joint. While further experiments may better clarify the circumstances under which this is produced, it nevertheless provides a further potential means of identifying anthropogenic utilisation of these species.

#### 4. Honey Hunting, Beekeeping and the Uses and Role of Bee Products in British Prehistory

Magnhild Peggy Gilje

It would seem that beekeeping or the use of honeybees (*Apis Mellifera*) and their products in prehistoric Britain is to a certain extent a “non-subject” which has been studied by very few academics. The sporadic mentions of the use of honeybees in prehistory are generally brief or highly speculative; often, just assumptions that honey would have formed an important part of a prehistoric diet with little or no attention to products such as wax and propolis. It is clear that honey and wax were used in prehistory and that the honeybee would have been present in Britain in prehistoric times. What remains unclear is to what extent honeybees were exploited, how this was accomplished, and what role honey and other bee products could have had in British prehistory. The evidence that can be used to examine this problem is ephemeral and needs to be addressed with reference to ethnographic examples and archaeological evidence from the rest of Europe.

#### 5. The Craft of the Maltster

Merryn Dineley

The ancient and traditional skill of the maltster was once known as the ubiquitous craft. There was a maltster in every farmstead, village and town. In the 21st Century, the craft could be described as being almost invisible. Most people are unaware of it and very few know what malt is or how it is made. Over the last one hundred years, science and technology have transformed the ancient practice of floor malting, which probably dates back more than ten thousand years. It is an important aspect of the origin of grain agriculture debate. Today malt is made in huge steel drums, or in malting towers, rather than on a traditional malting floor. There are only a handful of floor maltings left in the British Isles. In this paper I shall demystify the malting process and explain how it informs our understanding of grain processing techniques over the millennia. Malting, as a craft, has been overlooked in archaeological interpretations.

#### 6. Pottery as Evidence for Lifestyles in Early Iron Age Corinthia (c.1100-690 BC), Greece: Water, Commensality and Ownership

Sam Farnham

Archaeology, ancient history and ethnography are drawn upon to argue that it is useful to enquire into how key essentials such as water were obtained in order

to understand the role of food and drink in ritual activity. Firstly, the study area and chronological setting are introduced, secondly the results from the pottery quantification are described and thirdly the salient aspects of the North Cemetery at the site of Corinth are analysed.

#### 7. The Preliminary Results from a Herculaneum Sewer. What's Inside? Why? And What Can It Tell Us about Roman Diet?

Erica Rowan

When Mount Vesuvius erupted in AD79, it caused widespread destruction in the Campanian region of Italy, burying the Roman towns of Herculaneum and Pompeii. Subsequently, Herculaneum's unique state of preservation makes it one of the best sites where ancient Roman diet can be studied using environmental archaeology. The recent excavation, by Professor Mark Robinson and the Herculaneum Conservation Project, of the sewer lying under Cardo V has yielded a sufficient amount of environmental remains to begin a comprehensive study of Roman diet.

This paper examines the food items recovered from two of the sewer's 53 excavated quadrants. The first section will consist of a brief examination of Herculaneum and its sewer, followed by a discussion on the methods of food preservation. The second section will involve a detailed discussion of the findings and their impact on our current understanding of Roman diet, specifically in the Vesuvian area. The finds suggest that we have perhaps underestimated the health status of the inhabitants and overestimated the importation of foodstuffs into Italy. Since both environmental archaeology and its use in reconstructing ancient diet are still developing fields, it is hoped that this paper will not only shed light on the diet of the inhabitants of Herculaneum, but will also highlight some of the methods of the preservation of food remains.

#### 8. The 1270 Durrës Earthquake Victims from the Roman Amphitheatre Excavations: A Global Palaeonutritional Study of an Anthropological and Archaeological Sample

Sara Santoroa, Antonietta Buglioneb, Giovanni De Venutob, Paola Iacuminc,  
Barbara Sassic, and Loretana Salvadeid

During archaeological research in the South area of the Durrës Roman Amphitheatre (Albany), led by the Archaeological Italian Mission of Parma University, the discovery of the occupation layers dating to 12th-13th centuries was very important. In particular, inside a building (palatium) constructed in the cavea of the monument at the beginning of the 13th century, some skeletons were found of humans violently killed during the 1270 earthquake. Using a global investigation approach, the anthropoarchaeological investigation (morphological and isotopic analysis), integrated with the study of a faunal

sample dated from the second half of the 13th century, shows some interesting data about the nutrition standard and the catchment strategies of an urban human group. These analyses represent an important contribution to archaeological research in the Mediterranean area (the Adriatic east-coast), an area not investigated much especially for the Middle Ages.

## 9. Provisioning and Diet in Hamwic (Mid-Saxon Southampton): New Data and New Perspectives

Ben Jervis

Excavations in mid-Saxon Southampton since the 1940's have recovered large quantities of animal bone, pottery and increasingly environmental evidence. The pioneering work of Jennifer Bourdillon and Jenny Coy in the 1970's and 80's greatly informed our understanding of diet in the settlement from a faunal perspective. My research, focussing on the ceramic evidence, has added new data and new perspectives to our understanding both of diet within the settlement and its provisioning. I will focus on two main areas, firstly the development of cooking methods and secondly an evaluation of the provisioning of the settlement, using ceramic, faunal and environmental remains. A programme of ceramic use wear analysis and a small but targeted programme of GC-MS residue analysis has shed new light on the range of cooking practices in the settlement. The study of pottery distribution and deposition, coupled with previous studies of the faunal remains has informed our understanding of provisioning strategies both to and within the settlement. Of particular importance are the preliminary results of the GC-MS analysis, which has yielded extraordinarily promising results. The Hamwic data will also be placed into its regional and international context, to examine diet in early medieval wic trading centres as a whole.

## 10. Provisioning Shakespeare's Audiences: Food and Drink in the London Playhouses of the 16th and 17th centuries.

Julian M.C. Bowsher

The 'Shakespearean' playhouses of London represented a milestone in the development of English drama. They were also a unique form of building whose popularity is attested in contemporary accounts. Such accounts include references to the provision of food and drink for the audiences. Many of the playhouses are known to have had adjacent 'taphouses' whose role in such victualling appears to be an integral part of contemporary theatrical experience. Nevertheless, the numerous references to eating and drinking in play texts as well as associated stage properties also needs to be taken into account. Recent archaeological work on a number of these sites has included spatial analyses of differing uses, professional and social, within the buildings. Standard archaeological distribution analysis has allowed an examination not only of

serving and drinking vessels in ceramics and glass but also of botanical, faunal and invertebrate remains, leading to a greater understanding of what food and drink was consumed within these venues. This paper provides a brief synthesis of the historical, dramatic and archaeological accounts of food and drink in the playhouses. Together this varied evidence illustrates early modern attitudes to food and drink within this particular microcosm.

## 11. What Shall We Grow? Continuity and Change in Prehistoric Farming in Croatia and Serbia.

Kelly Reed

From the late Neolithic through to the late Bronze Age we see the occurrence of many socio-cultural and economic changes in Southeast European societies, such as the introduction of metallurgy, the growth of trade, and evidence for increasing centralisation of power. Agriculture is central to everyday life at this time, and must have both underpinned these developments and been changed by them. In this paper I explore these socio-cultural changes within Croatia and Serbia by examining the botanical remains of arable crops and weeds. As part of this project I will explore whether changes in agriculture occurred and how these articulated with wider archaeological evidence from the region.

The preliminary results show continuity in the main cereals, but by the Bronze Age a wider variety of crops appear. How does this relate to the choices a farmer or a community make? By looking at the archaeological as well as the archaeobotanical record I hope to address questions including;

How was the land utilised? Can different agricultural regimes be identified through the reconstruction of crop sowing times and cultivation intensity?

Do the plant remains support a greater emphasis on keeping animals during the Copper Age?

Is the increase in crop diversity and the introduction of new species linked to agricultural intensification and increased social complexity in the Bronze Age?

## 12. Processing and Treatment of Drinking Water in Iberia (c.6th-2nd Century BC)

Meritxell Oliach Fàbregas

In this paper I want to illustrate the different solutions developed by protohistoric communities for the catchment, storage, and conservation of water. In particular, I will focus on the processing of water for human consumption in the Iberian period.

During recent years, research about the Iberian culture has been interested in subjects related to the conservation and transformation of food

products. Particular attention has been paid to agricultural production, storage systems, food processing, and the structures used for obtaining oil and wine. The wine is the only drink consumed by the Iberians that has been studied within current research and, although water is the most important drink in all societies, it remains completely absent in research about protohistoric drinks.

Nevertheless, the available archaeological data, along with ethnographic research, allow establishing the parameters in order to develop research about water in the protohistoric period. My previous work has consisted in an initial collection of the different processes and treatments that water would receive before its consumption. Besides, I have started to sketch the levels of quality and how healthy it would be in Iberia in this period. Finally, this research has shown that the route followed by the water from the moment of its catchment and that of its consumption was more complex than we had thought until now.

### 13. Food Processing and Consumption Spaces: the Case of Molí d’Espígol (Catalonia, Spain) in the 3rd Century BC

Pilar Camañes and Meritxell Monrós

Food constitutes one of the basic requirements for human beings. However, the great majority of it doesn’t come directly from nature, but is the result of complex processes with consumption as the final result. This research aims to contribute to the study of spaces connected to the nourishment process (for example, storage, processing and dining spaces) during the Iron Age and, more specifically, at the Iberian site of Moli d’Espigol (Tornabous, Catalonia) between the 6th century and the 2nd century BC.

The results shown in this paper are focused on two significant areas of this archaeological site, both from the 3rd century BC. The first location is Singular Building C, where five different spaces were documented. Their interior areas contained a variety of equipment and artefacts, allowing us to understand the activities undertaken in these areas. They were used for both storage and food processing activities, such as the grinding and boiling of food. The second location is a banqueting area located in singular Building A, whose central room has provided significant evidence suggesting the large-scale consumption of food and drink, and of an area where feasts and other celebrations took place.

This research is a contribution to the knowledge of spaces whose main functions are related to nourishment, directly as banqueting or dining areas or indirectly as storage and food processing areas.

### 14. Eating and Drinking with the Dead. Archaeological Evidence for Commemorative Rites at the Cemeteries of Tarraco (Tarragona, Spain), I-IV Century AD

Judit Ciurana Prast

The aim of this paper is to present archaeological data attesting to the funerary commemorative rites at the necropolises of the Roman city of Tarraco. Written evidence on funerary rituals is extremely focused on the city of Rome and takes in a restricted period of time (1 BC – 1 AD). Moreover, the main focus of literary texts is the aristocracy. The rest of the population and their funerary habits are not taken into account. Conversely, when dealing with archaeological data these invisible social groups emerge and it is possible to study funerary rites.

Tarraco, capital of the Provincia Hispania Citerior, is mainly represented by three suburban areas that were located beside the entrance and the exit of the Via Augusta. Microstratigraphical excavation of the living layers of the Tarraco necropolises has allowed us to detect material evidence for the commemorative rites of the dead, such as libations, food offerings and banquets. These rituals, which took place near or on the grave, have left a material trail. The analysis of ashes, charcoal, animal bones and plant remains found near the graves, the living frequenting these areas, and the rituals performed, contributed to its continuity and particular characteristics. Grave goods, specifically pottery assemblages, have much to offer for ritual studies. It is proved that there was a previous selection of certain forms, such as vessels for holding liquids (flasks, jugs) and solids (flat dishes and bowls).

Archaeology provides us with information about rituals performed in burial contexts beyond written evidence. A contextualized view is acquired through spatial analysis of family burials, gathering all the information available from anthropology to zooarchaeology, together with classical studies.

## 15. Relating Meat and Fish Consumption to Climate Change on the Swahili Coast (AD 700-1500)

Eréndira Quintana Morales

Swahili settlements are distributed along the East African coast from Somalia to Mozambique. Over time, Swahili towns developed into essential hubs within the complex cultural network of the historical Indian Ocean trading system. Archaeologists have found, and sometimes collected, bones and shells in these settlements as evidence for subsistence strategies. However, little research has been undertaken on the changing importance of fish and shellfish consumption relative to cattle herding (for example, Horton et al. 1996). In my PhD thesis I will clarify the shifts in subsistence strategies by consolidating and contributing to this data. I am interested in what cultural and environmental factors were associated with significant changes so far observed in fish consumption, in relation to an increasing consumption of rice (Walshaw 2005) and domesticated animals.

I am working with published faunal reports and my own analysis of recently excavated assemblages. I will investigate the changing intensity of marine exploitation from AD 700 to 1500 at these sites, and the key environmental and cultural pressures influencing consumption practices.



Preliminary results show an increasing reliance on domesticated animals, with a significant shift in the ratio of fish to domesticated animals in the 12th century. I hypothesise that these changes are related to shifts in lake levels recorded by palaeoclimate studies of East African lake sediments (Stager et al. 2009; 2005; Russell and Johnson 2007; Johnson et al. 2002; Verschuren et al. 2000). Further work will examine the effects of regional climate fluctuations on coastal environments and cultural influences leading to changes in subsistence.

## 16. Reare the Goose: Recognising a Standard Method of Carcase Dismemberment

Louisa Gidney

The role of the carver has always been of importance in acknowledging the relative status of the diners by the portions allocated. Modern methods of carving are rooted in the 19th century, with such detailed instructions as those provided Mrs Beeton's *Book of Cookery and Household Management*. Interest in this topic was stimulated by the realisation that at a variety of medieval and post-medieval sites in north-east England the goose sternum had been dismembered in a prescribed manner that is unlike the contemporary method of serving a goose. The find of all the adjoining sternum fragments, and associated limb bones, from an excavation at Richmond Castle, North Yorkshire prompted further investigation of the historical documentation for the serving of goose. A facsimile printing of the 1638 edition of John Murrel's *Two Books of Cookerie and Carving* provides detailed instructions on how to "Reare the Goose", which would produce cutting lines identical to the archaeological finds.

To test the accuracy of the method, a goose was cooked (baked in the oven rather than spit-roasted) and carved according to the instructions given. The resulting bones are not as close to the archaeological specimens as anticipated. The medieval and early post-medieval carvers did not have a carving fork to assist in the operation. This is the critical difference between ancient and modern carving and portioning of the goose. Being overly anxious to eat the hot goose, the carving was endeavoured when the bird was, literally, too hot to handle. Further practice, with birds that had cooled further, produced dismembered sternum fragments more comparable to the archaeological finds.