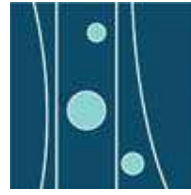




Conchological Society
of Great Britain &
Ireland



Association for
Environmental
Archaeology

Conchological Society and AEA joint Spring Meeting

~ **MOLLUSCS IN ARCHAEOLOGY** ~

ABSTRACTS

In the following abstracts, for multi-authored papers, the speaker is underlined>.

Shell-hash to shell-size: reconstructing original shell size from fragmentary archaeological remains (the common *Mytilus edulis* L., as an example)

Greg Campbell

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The sizes of shells being harvested are key indicators of the selection criteria being employed by past harvesters, the shellfish habitats being targeted, and the effects of harvesting on the targeted populations. However, taphonomic processes lead to highly fragmentary archaeological shell remains: few shells are recovered whole, and those that are whole are the more robust, and therefore unrepresentative. Original shellfish sizes must be estimated from dimensions those parts that survive well. Most formulae for size estimation are unreliable because they do not account for two biological principles:

- (1): Shape must vary with size (growth is allometric), so ratios between dimensions are not constant, but vary with size;
- (2): The way in which shape varies with size differs between habitats (shellfish exhibit ecophenotypic plasticity), so the reconstruction formulae must be tested across a wide range of habitats.

The necessity of incorporating these two principles when deriving valid size estimation formulae will be illustrated using a shell notoriously fragmented in archaeology, mussels (here, *Mytilus edulis*).

Sand at Gwithian, Cornwall; palaeoenvironment, molluscs and archaeology

Thomas Walker

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Sand dunes are common round the coasts of Britain and archaeological sites are frequently found buried under windblown sand. Gwithian, on the east side of St Ives Bay in west Cornwall, is a multiperiod site with archaeology from the Mesolithic to the late medieval period. A Bronze Age settlement and a post-Roman industrial site were excavated in the mid-20th century and showed separate phases of occupation, each separated by deposits of sand. Relatively few detailed studies have been undertaken on dune sites, and a new study at Gwithian has provided a precisely dated and archaeologically correlated records of blown sand sites, adding to knowledge of human settlements on the British Atlantic Coast.

A coring transect across the Red River valley at Gwithian has produced sediments up to 10m in depth. Multiproxy analyses have been used to assess the palaeoenvironment, using molluscs as one of the prime indicators. A small trench excavation showed Bronze Age buried soil horizons with ard marks and animal hoof prints preserved under blown sand. The

valley basin was marsh with alder fen during much of the prehistoric period, and not a marine estuary as previously postulated. Geochemistry had revealed residues from extensive mining, mainly during the Industrial Age, but with some evidence of prehistoric activity.

The study has allowed some correlation of periods of settlement abandonment associated with distinct episodes sand deposition, with may correlate with secular climate change, with the suggestion that sand stability/instability played a major part in the siting and timing of human activity in the area.

Ancient Forests in Malta: Fact or Fiction? A Land Snail Analysis **Bri Eastabrook**

Masters graduate, University of Plymouth

The Maltese archipelago provides an ideal study area for examining the impact of human activity on natural vegetation. This is due to its well documented occupation history which spans from ~7300 years BP and the belief that the current landscape has been degraded by anthropogenic activities. This has led to the hypothesis that the islands would have been more densely wooded if humans had not interrupted natural succession. Land snails were used to determine the landscape history through palaeoecological investigations into samples taken from archaeological sites. A contemporary study of Mollusca presence in different types of treed habitat found within the archipelago was also undertaken so as to build upon knowledge about Maltese land snail diversity. This information provided evidence for an indicator species, *Lauria cylindracea*, which was solely found in areas of oak woodland. Using these findings samples from archaeological sites were analysed for the presence of this species and other woodland assemblages, and therefore the presence of prehistoric woodland. Evidence from four archaeological sites shows a lack of the indicator species as well as any assemblages that were well represented in modern day woodland. This suggests that the Maltese landscape has not been deforested by human activity and that the modern day mosaic of different habitats has been long established.

A la mode: shell jewellery across the Epipalaeolithic/Neolithic transition in northern Syria

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Previous studies in the Near East have charted the manufacture of shell beads from the Palaeolithic onwards. The trend appears to run from the use of a few highly selected species, notably *Nassarius* during the Palaeolithic, towards a gradually widening repertoire to include dentalia and cowries in the early Neolithic and the apparent indiscriminate use of available shells by the Bronze Age. New strategies of shell exploitation in the Levant have been attributed to the economic changes that accompanied the transition from hunter-gatherer to farming communities. The early site of Tell Abu Hureyra in northern Syria spans the Epipalaeolithic/Neolithic transition and the shell assemblage provides a unique opportunity to explore changes in the cultural use of shells over this seminal period in human history. At least 14 species of molluscs were utilised at this site to create shell ornaments. The range of species provides insights into trade networks, and the wear patterns on the shells offer hints as to how these presumed beads and ornaments were worn and displayed.

Radiocarbon and isotopic analysis of bivalves in archaeology

Ricardo Feranades & Alexander Dreves

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Bivalve shells are found in diverse archaeological contexts and are indicative of their varying contribution to past human diet. Radiocarbon and isotopic analysis of often well-preserved bivalve shells can provide important information on past environmental conditions, site's chronology, and on the isotopic baseline relevant in human paleodiet studies.

As part of ongoing research, modern and archaeological bivalve samples of different species have been recovered from marine and freshwater locations within Germany. Different bivalve fractions (soft tissues, shell carbonate, and shell conchiolin) were physically/chemically pre-treated and targeted for radiocarbon and isotopic analysis ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$).

Obtained results show that bivalve specimens from different locations have a highly variable but significantly lower ^{14}C content compared with the contemporary atmosphere, i.e. they show a radiocarbon reservoir effect. Furthermore, in some instances, significant differences were observed between radiocarbon measurements in different bivalve fractions (shell carbonate vs. soft tissues). These were linked to species, growth stage, and variations in ^{14}C concentrations of the water carbon pools (dissolved inorganic carbon, dissolved organic carbon, and particulate organic carbon).

The variability in local radiocarbon reservoir effects and potential differences in ^{14}C concentration between edible (soft tissues) and preserved (shell carbonate) bivalve fractions constitute a potential challenge in the establishment of accurate chronologies. However, large local radiocarbon reservoir effects also provide a novel dietary proxy that can be used in the detection of past human consumption of aquatic resources when other isotopic proxies fail to provide unambiguous results.

Archaeological Site Formation Processes and Environmental Change between the Neolithic and the Norse Period in the Machair of the Outer Hebrides

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The western coast of the Outer Hebrides is largely formed by a band of wind-blown shell sand, known as the *machair*, which started to accumulate during the Neolithic. This area became the focus for human settlement on the islands as it provides fertile soils in an otherwise acidic peaty landscape.

The calcareous nature of the sands ensures that mollusc shells are exceptionally well preserved, while uncarbonised organic material is normally lost. Snail assemblages thus represent an essential element for the understanding of settlements on these islands.

Despite the relatively low diversity of the molluscan faunas in north-western Scotland, distinctive patterns have emerged from the snail assemblages recovered from the complicated layer sequences typically encountered during the excavation of machair sites.

The assemblages reveal the microenvironments and human activity areas that existed within these sites (habitation spaces, zones for middening, grazing or ploughing, abandoned surfaces that became overgrown or covered by wind-blown sand) and thus provide crucial information about site formation processes. The presence of small marine shells also shows the use of seaweed as a fertiliser, while freshwater molluscs indicate either flooding or the use of sedges for thatch etc.

By analysing the molluscan faunas from a number of archaeological sites dating from the Neolithic until Norse times, patterns have also emerged that clearly show how early landscapes with trees and bushes gradually became replaced by an entirely open landscape with grazed short-turf grassland interrupted by active dunes with marram grass.

The arrival of marker species also provides a strong biostratigraphic tool for the relative dating of layers within machair sites.

**Neolithic Occupation and palaeoenvironmental reconstruction in the State of Qatar
Emma Tetlow¹, Richard Cuttler, Liam Delaney & Faisal Abdulla Al-Naimi**

¹ Senior Scientific Officer and Logistics Manager, Qatar National Historic Environment
Record: Qatar Archaeological and Submerged Landscape Project

Since 2009, the Qatar National Historic Environment Record (QNHER) has worked extensively on a number of Prehistoric and Pre-Islamic sites throughout Qatar. This paper aims to discuss exploitation of marine Mollusca from a variety of archaeological contexts in Qatar. It will draw upon work undertaken by the QNHER Project in Wādī Debayan, Ra's Matbakh and Al Wakra where shellfish were clearly an important part of the Neolithic/Pre Islamic diet. At several Bronze Age sites, evidence indicates industrial-scale processing activity to produce purple dye.

Due to the absence of more traditional reconstructive methods such as pollen, insect or plant remains, the marine molluscs from Wādī Debayan, Ra's Matbakh and Al Wakra have also been applied as a reconstructive tool. The molluscs were used to extrapolate the wider environment at the time of deposit formation which, combined with sedimentary evidence has enjoyed some degree of success. This process was particularly successful in Wādī Debayan where two very different biomes developed within the wādī during the mid and later Neolithic, and the highlighted the differing resources exploited as a result of dynamic changes in sea-level.

**Scale, snails and resolution: land-use reconstructing and re-evaluating the history of
the chalklands**

Mike Allen

Conchological Society / Allen Environmental Archaeology

John Evans' work principally examined Neolithic buried soils on the chalkland to confirm the presence of a wooded landscape, seen as widespread on other geologies in the pollen records. He also used the data to examine evidence of human activity such as woodland clearance and subsequently tillage, farming and pasture, as epitomised by South Street; the most published and reproduced snail diagram. His research proved the presence of woodland and of Neolithic clearance, but he was less interested in local site land-use histories derived from ditch sequences. However, in the absence of rare buried soils in the

ploughed chalklands, the analysis of ditch and colluvial sequences from archaeological sites produce local site narratives which provide evidence of activities not recognised in the conventional archaeological record. Further, en masse, they also start to allow us, at a much larger scale, to re-examine the re-evaluate the chalkland histories of Wessex and the south-east – and re-address long-held, now incorrect assumptions, of the generic vegetation history. This has dramatic implications for the presence and location of initial earlier (Mesolithic to Neolithic) human activity and subsequent monument, and occupation, complexes.

A land mollusc midden at Taforalt, Morocco

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Grotte des Pigeons is a large cave in North Eastern Morocco. Archaeological finds in the cave were originally discovered in 1908 with extensive excavations being undertaken in the 1940's and 50's led by the Abbé John Roche. The site contains evidence of both Aterian (yellow series) and Iberomaurusian/Epipalaeolithic (grey series) occupation with a large number of human burials having been recovered from Iberomaurusian layers at the back of the cave. A number of Nassarius shells, thought to have been used as beads, have also been recovered from the Aterian layers (dating back to approx. 82,000BP).

Of particular interest are the Iberomaurusian cultural layers which begin c. 21500 cal BP in the upper part of the yellow series and the upper ashy midden grey series dating between 15200 and 12600 cal BP. These ashy grey series layers are rich in animal bone, microliths, charred plant remains, phytoliths and extraordinary amounts of edible land snails. These 'escargotieres' or snail middens are well known throughout this period and the succeeding Capsian period in the Maghreb. Similar land snail middens have also been recorded in Mediterranean Europe during this period and in the early Holocene.

100 contiguous samples were taken from a mollusc column during two seasons of fieldwork in 2009 and 2010. The results from this sequence will be presented and compared with other sources of evidence for environmental change and human activity. This project forms part of a wider Cemeteries and Sedentism in the Epipalaeolithic of North Africa Project which has been funded by the Leverhulme Trust. The Taforalt excavations are led by Prof Nick Barton (Oxford University) and Prof A. Bouzouggar (Rabat).

Tales told by Oysters

Liz Somerville

School of Life Sciences, University of Sussex

It is relatively straightforward to devise a consistent method for examining the oysters from archaeological sites. My own version of this will be described, together with examples of the information which can be gained. This will be drawn from my work on material from sites largely in southeast England. More challenging is to think of ways in which such a methodology can give insight into more subtle questions about oyster exploitation – let alone understanding why there are periods when this resource is not used. I hope to introduce these questions to you, and seek your help in how to answer them.