Welcome to Issue 34 of the A+M Newsletter. This issue contains important news about the next AMWG meeting, which had been scheduled for September 2020, but like so much else globally has been postponed. It also contains a note about the excellent Virtual Palaeoscience (ViPs) project, which aims to support online teaching, and research contributions on shell middens in the Farasan Islands of Saudi Arabia from Niklas Hausmann, and land snail shell (and broader archaeological) preservation in northern England from Cath Neal. Thanks to everybody who has submitted articles or shared publications and other items of interest.

I would like to remind the AMWG community that we welcome any contributions related to archaeomalacology and are especially interested in member photos/images, news and updates.

ABOUT THE NEWSLETTER

The Archaeo + Malacology Newsletter warmly invites contributions related to archaeomalacology in its widest sense. Please email submissions and questions to the editor. **Annual deadlines are 31st January for circulation in February and 31st July for circulation in August.** Current and previous issues of the newsletter are available at archaeomalacology.wordpress.com

Editor: [Matt Law](mailto:MattLaw@archaeomalacology.com)

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Postponed to 11-13 September 2021
Venue: Dept. of A.I.H.C. & Archaeology, Deccan College P.G.R.I. Pune 411006, Maharashtra, India

This is to inform that the international conference Molluscs and Ancient Human Societies and meeting of the Archaeomalacology Working Group (AMWG) which was to be held at Pune 11-13 September 2020 has been postponed to September 11-13 2021 due to the severe pandemic crisis. Further updates will be made available in the next Archaeomalacology newsletter. All those who had expressed their desire to participate are thanked for showing interest and hoping will be able to do so. Those who would like to participate can contact amwg2020@gmail.com after September 2020.

Dr. Arati Deshpande-Mukherjee
Assistant Professor,
Dept. of AIHC & Archaeology, Deccan College PGRI Pune 411006, India

ViPs (VIRTUAL PALAEOSCIENCE).

ViPs (Virtual Palaeoscience) is a community-led project to create a shared archive of online palaeoscience teaching resources both as a short-term COVID-19 response and for longer-term enhancement of learning, accessibility and outreach. The Project Team consists of Jane Bunting, Simon Hutchinson, Kim Davies, Nicki Whitehouse and Des McDougall. Following a successful launch meeting in May 2020, the project has set up working groups to find, evaluate, and bring together existing materials in a single web resource and to create a range of new materials to meet specific needs. In August, these new resources will be presented at a virtual workshop and plans for longer-term projects, including the creation of multi-faceted virtual landscapes, will be developed. Archaeomalacologists are very welcome to join us! All details on how to be involved: https://virtualpalaeoscience.wordpress.com

Dr M. Jane Bunting
Reader (Palaeoecology/Palynology)
Department of Geography, Geology and Environment
University of Hull, Cottingham Road, Hull HU6 7RX, UK
MALACOLOGICAL DATA FROM THE FARASAN ISLANDS SHELL MIDDENS

Dr. Niklas Hausmann – Niedersächsisches Institut für historische Küstenforschung (NIHK), Wilhelmshaven, Germany

(niklas@palaeo.eu)

We recently published the archaeomalacological dataset for the excavations and test pits on the Farasan island shell middens in Quaternary International (Hausmann et al. in press). In total, the Farasan Islands have over 3000 shell midden sites, which have been excavated between 2006 and 2013 by the DISPERSE project under Geoff Bailey. While the data has been published in some places already, specifically the data from the shell mounds of JE0004 and JW1727 (Bailey et al. 2013; Hausmann and Meredith-Williams 2017), which have been studied for their human remains and for seasonal shellfish consumption, there were 16 other excavations of similar sized shell deposits and about two dozen test pits, which have also been analysed for their species composition as well as mollusc size changes. Figure 1 shows the species composition of these sites, which mainly consist of Conomurex fasciatus but occasionally a midden contains large percentages of oysters (Pinctada sp.) and other molluscs as well. This overall picture is very much in agreement with what we have seen in the published sites, but shows that there are many other species that have previously been underreported. The whole dataset including all identifiable species is available on github and is free to be accessed by anyone.

SHELL SIZES

The large number of shell middens, their size (~100 m³), and the fast accumulation rate of some of them (e.g. JW1727 likely had an occupation span of <100 years) suggest that there could have been some ecological impacts on the local populations of shellfish species. Since many sites focus on C. fasciatus, we especially thought that some variation in specimen size could occur through time, similar to what has been shown in other studies that looked at unsustainable shellfish harvesting. Interestingly, we did not find these impacts at all. Instead we found that sizes were largely consistent within on site.
Using the earliest and latest radiocarbon dates from each site, we interpolated the mean shellfish size data from all bulk samples and were able to compare the datasets of multiple sites at once and thus were able to compare general changes through time across the three bay areas (Janaba East, Janaba West, and Khur Maadi). In Figure 2 the data shows that each bay area has its own range of shell size which seem to rarely overlap with other bay areas. More importantly, the size variability within one site is usually smaller than the variability within one bay, meaning that the size variability within bays is largely a result of sites differing from each other rather than the sites themselves changing through time. In other words: Regardless of the time, shells from the same bay are more similar than shells from different bays and shells from the same site are more similar than shells from different sites.

**Fig. 2, Chronological change of shell sizes based on their aperture length. Circles represent mean size value per bulk sample. Size of circle represents the standard error. Circles are grouped by bay area (left) and by individual site (right) to better compare the spatial size variability with the temporal variability.**

**BAYS**

We think that the reason for these patterns is the spatial distribution of the sites across the island and in turn the spatial distribution of the nearshore environments that are accessed by prehistoric people for shellfish gathering. This means that many shellfish would have been gathered close to the shell midden site and that the shell midden composition reflects the habitat conditions in the nearshore environments close by.

Figure 3 shows the nearshore environment at the time of occupation (sea level dropped by a few meters over the last 6000 years and parts of the littoral are now exposed). We suspect that the extensive shallow water areas that are found in Khur Maadi bay (Fig. 3 a) and in Janaba West (Fig. 3 b) are habitats that better facilitate shellfish growth than the more narrow shoreline in Janaba East (Fig. 3 c) and that this is reflected in the shellfish sizes found in the respective midden sites. Over the occupation period of the middens, these conditions barely changed and we thus do not see a huge change in shellfish size through time, despite intense harvesting.
These spatial patterns are easy to show when you have many sites to look at within one bay. Nevertheless, as archaeologists we often interpret shell sizes from only one site and extrapolate from there. It would thus be worth considering that changes in size through time could be linked to not only over-harvesting or environmental changes, but also to people getting their shellfish from different places. This is especially important when shellfish are processed in central places or found in cave sites. Ideally people would always go to the parts of the shore where they will find the largest shellfish, but other factors can change this. Some areas might also have other food resources that are invisible to us. There might also be social networks that are being followed. If small kids are involved in the harvest, you might go more sheltered bays or on a hot day you go where trees could provide shade. Ultimately, this study points towards something that we already knew: 1. a good measure of variability is important to contextualise our results and 2. that information on shell growth rates rather than only shell size is required to get an idea of how big human influence is on shellfish populations.

Figure 3, site locations (black dots) and analysed middens (coloured circles) with colours indicating the mean size of C. fasciatus measured by aperture size.

REFERENCES CITED:

BACKGROUND

This paper discusses the issue of land snail preservation on the chalk and some of the possible mechanisms for relatively recently observed degradation. This comes ‘hot on the heels’ of the paper in the last newsletter about variable preservation levels and time-averaging (Law 2020) but this paper is based upon research undertaken on the Yorkshire Wolds.

The Yorkshire Wolds (Figure 1) comprise mainly a chalk landscape which rises in a steep escarpment from the eastern Vale of York and the northern Vale of Pickering. Towards the eastern coast the Wolds fall away gently eventually merging with the Holderness Plain. As part of a research programme, a series of samples were taken for the retrieval of land molluscs from dry valley sediments, to be analysed in conjunction with other datasets in order to elucidate a broad Holocene landscape history (Neal 2010). The Yorkshire Wolds is relatively well-studied by archaeologists and comprises a significant prehistoric - medieval landscape but most research has been site and period-based, with little at the landscape level or using geoarchaeological methods. This research aimed to draw on the substantial body of dry valley research on the southern English chalk (Bell 1982, Allen 1992, French et al. 2007) and to characterise the dry valley deposits of the ‘High Wolds’ (above 164m above Ordnance Datum (aOD), Figure 2) and to relate the findings to both geomorphic and human modification processes where appropriate.
METHODS AND FINDINGS

Locations for auguring/sampling were based on a combination of the research questions, valley morphology and on access. Three locations were selected, and a series of auger transects were undertaken at Vessey Pasture Dale, Fairy Dale and Whay Dale/Burdale junction on the northern central Wolds.

A series of test-pits were positioned on auger transect points, where there was (judgementally), the most variation between points. Then c.1 kg samples were taken, from different stratigraphic units avoiding boundaries (Evans 1972, 41). Chemical analyses were undertaken and the rest of the weighed sample was processed for mollusc retrieval. The dried samples were disaggregated using 30% hydrogen peroxide (Evans 1972, 44) and sieved through a 500 µm mesh. The assemblages were identified using Kerney and Cameron 1979; Kerney 1999; Evans 1972 and the University of York, Department of Archaeology Reference Collection (aided by Professor TP O’Connor). Using a binocular microscope, identification considered shell size, morphology and microstructure. The Biological Records Centre (formerly Centre for Terrestrial Ecology) provided modern mollusc distributions for the study areas.
The most initially promising location was Vessey Pasture Dale, designated as an SSSI by virtue of unimproved calcareous grassland (with permission from Natural England); there was proximity to a Scheduled Monument, an ancient long-distance trackway, an ancient water source with documented Mesolithic activity and the possible centre of a Bronze Age ‘estate’ (Hayfield et al. 1995, 402). A total of 8.5 kg of sediment was processed, with three shells recovered from the samples.

At Fairy Dale the location for investigations was chosen to avoid the disturbance associated with the construction of the 19th century Burdale Tunnel/station. Fairy Dale has an association with the prehistoric Towthorpe Group, the Towthorpe Ridgeway, the Fairy Stones (Regionally Important Geological Site) and a Roman farmstead. This concentration of activity implies that this dale holds a significant geographical position which is difficult to appreciate today (Figure 3).

At Fairy Dale 17.5kg of sediment was processed and 289 shells were recovered. If we correlate the numbers of shells recovered with the pH results then the greatest number of shells come from sediments with relatively high pH values (for example 121 shells from sediment pH 8.57, and 42 shells from sediment pH 8.55). The sedimentary material was mostly a poorly sorted heterogeneous colluvium and most basal deposits were clay loams indicating longevity of deposition, and the translocation of clay particles down through the profile. Land snails were variably preserved here, not warranting statistical analysis, but a grassland/catholic species assemblage was recorded in contrast with an assemblage of shade lovers in another test-pit. The artefactual material recovered at Fairy Dale represented the Iron Age through to the modern period although the density of artefacts was low.
Whaydale does not figure in the archaeological literature nor any accessible documentary source. The adjacent main valley, Burdale, contains an Anglian settlement site which was identified by this project and was subsequently excavated by the University of York (Richards and Roskams 2013). Auger transects and test-pits were undertaken in 2005, and in 2006 an 11m long machine dug valley transect had a maximum depth of 1.8 metres, with solifluction gravels in the base and evidence for periglacial involutions. Anglian ceramic fragments were recovered in low quantities. Over both campaigns a total of 73kg of sediment was processed for land snails and 273 shells were recovered.

As intimated above, the quantities of shell recovered from each sedimentary unit was limited and precluded any statistical analysis or detailed interpretation. General trends were identified, and some were informative when presented along with other findings.

At Fairy Dale we considered the mollusc assemblages from 2005 with a student project from two decades earlier (Hotston 1985). The test-pit locations from 1985 were not surveyed but descriptively the locations were not dissimilar to 2005 sampling locations. Each sample in Hotston’s study weighed 2 kg and whilst some of the samples were devoid of shell, most samples contained over 30 shells, with a maximum of 367. Hotston’s assemblage contained several species which are not in the modern distributions, but these were single examples.

Hotston’s success in recovering land snail assemblages in 1985 and our difficulty doing the same in 2005 may be a coincidence, mollusc rich sediments may still exist but were missed. Coupled with the lack of shell from the other sites another, more plausible, explanation is that there has been a material change in the condition of these valley sediments since the 1980s. This is unlikely to be a change in pH for, although Hotston did not record any pH values, the deposits at Fairy Dale remain calcareous, with predominantly basic pH values. It is possible that current pH values are irrelevant in many cases because the deposits here are a development of the original loess or brownearth sediments, which were acidic or neutral in the early Holocene, and have now become calcareous. Some of these sediments therefore may not have historically contained any land snails. Any period of non-calcaceous sediment development leads to a lack of shell preservation.

Within unenclosed lowland grassland occurring on chalk the expected pH status is usually between 6.5 and 8.5, but this can drop as low as 5.0 (Joint Nature Conservancy Council 2006); at Vessey Pasture there were values of 5.41 and 6.30 which are acid-neutral to neutral in this protected habitat (SSSI). These samples can be considered non-calcareous brownearths. The degree to which these deposits are related to processes of pedogenesis or to the application of artificial fertilisers has not been established. The leaching of sediments commonly results in decalcified deposits even on areas of calcareous solid geology (Murphy 2001, 2). The possible prediction of areas of likely preservation is difficult because indicators such as pH and base status are not fixed, undergoing changes related to weathering, leaching and the re-absorption of metallic cations. This can create shell-rich layers interleaved with shell-free layers (ibid).

If we discount the coincidental explanation the difference in mollusc preservation at Fairy Dale it is most likely due to either a period of widespread decalcification, which would have had to occur between 1985 and 2005, or due to the loss of organic material by the leaching of a mildly acidic precipitate, common in northern Europe. The nature of the precipitate could have been altered by either an increase in the acidity of precipitation or by a local increase in acidity, for example by the areal use of artificial fertilisers, by local agribusinesses. The likelihood of leaching is influenced by groundwater and air quality.

The air quality of the UK is continuously monitored by DEFRA and the data is available via the UK National Air Quality Archive (2009). The report on Air Pollution in the UK for 2007, which records the levels of pollutants, finds that the levels of nitrogen dioxide on the Yorkshire Wolds are low, below 10 µgm–3 (the lowest category) compared with greater than 60 µgm–3 in London. However, the measure for particulate matter pollution in East Yorkshire is 12.5–15 µg/m3, a moderate value. This small particle and droplet pollution is associated with a range of processes (elemental and organic carbon release), and arises from the mechanical generation of particles, for example from quarrying or building. One report looks specifically at particulate pollution and precipitation and concludes that particulate sulphate concentrations have shown a downward trend in the UK since the 1980s (Lawrence et al. 2007). Comparing acid deposition to levels of precipitation shows the Yorkshire Wolds in a favourable condition compared with the
levels recorded when monitoring first began, however the east of England, with its proximity to the continental landmass, and high levels of agricultural intensity has higher levels of acid deposition than many parts of the UK.

Geomorphological and sedimentary processes were investigated successfully during this project. Assumptions about the nature of widespread deep, loess-based soils were refuted along with the recognition that the Yorkshire Wolds, despite the absence of water courses, is not a closed sedimentary system due to the high levels of precipitation and the valley networks themselves. The silty nature of Wolds soils makes them especially susceptible to wind/sheetwash erosional processes. Relatively few shells were recovered by various programmes of primary fieldwork, and secondary sources (assemblages from excavation for example) were used in the final summary. Although disappointing, from a landscape history perspective, this methodological challenge is one of importance for thinking about the future of palaeoecological research across the UK.

In addition to historic landscape modification of the Wolds, substantial landscape change has influenced the area over the course of the last century. The chalk grassland, that was once the predominant mosaic vegetation, now covers just 1.3 % due to an increase in arable farming during the 20th century (English Nature 1997, 3). Changes in farming methods (intensification) with changes to the nature and structure of farming (agribusinesses) and greater pollution sources may have reduced our ability to characterise the palaeoenvironment for the Yorkshire Wolds.

REFERENCES


SEASONAL SHELLFISHING ACROSS THE EAST ADRIATIC MESOLITHIC-NEOLITHIC TRANSITION: OXYGEN ISOTOPE ANALYSIS OF PHORCUS TURBINATUS FROM VELA SPILA (CROATIA)

Branscombe TL, Bosch MD, and Miracle PT.

*Environmental Archaeology*

DOI: [https://doi.org/10.1080/14614103.2020.1721695](https://doi.org/10.1080/14614103.2020.1721695)

The Mesolithic-Neolithic transition is a classic topic of archaeological discussion, and the East Adriatic is of particular interest as a gateway region for agriculture entering Europe from the Near East. Neolithisation along the East Adriatic coast has been characterised as a two-wave process of leap-frog demographic replacement along the Dalmatian coast, followed by a longer process of acculturation further inland. Research on this transition primarily addresses the arrival of Neolithic technology and domesticates, but the view from ‘traditionally Mesolithic’ activities can provide an alternative perspective. This pilot study highlights one such practice, identifying changes in the seasonality of shellfish gathering over the Neolithic transition using material from Vela Spila, Korčula (Croatia). Specimens of the gastropod *Phorcus turbinatus* from across this transition were assessed using oxygen isotope analysis. Results showed a focus on summer and autumn collection during the Mesolithic, which then shifted to autumn and winter in the Neolithic. These results indicate differences in shellfish gathering and exploitation across the Neolithic transition, and implications for the demographic transition and human-environment interactions are discussed. Shellfishing in the East Adriatic is identified as an area of Neolithisation rather than Mesolithic continuity.

JOURNAL ARTICLES


RECENTLY SHARED ONLINE


Various research works of Anne Bardot-Cambot, including her PhD thesis "Les coquillages en Gaule romaine, entre Méditerranée et Rhin. Approche socio-économique et socio-culturelle."(2010: Université Michel de Montaigne Bordeaux 3) (with thanks to Vianney Forest for the notification) [https://independent.academia.edu/BardotCambotAnne](https://independent.academia.edu/BardotCambotAnne)