

THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER

Issue Number 17, June 2010

Coordinator: Janet Ridout-Sharpe, BSc ARCS
66 Radnor Road, Wallingford, Oxfordshire OX10 0PH, UK
Email: j.ridout-sharpe@cabi.org

Current and previous issues of the *Archaeo+Malacology Group Newsletter* are available at <http://triton.anu.edu.au/> and <http://home.earthlink.net/~aydinslibrary/AMGnews.htm>, with thanks to Kat Szabo of the ICAZ Archaeomalacology Working Group and to Aydın Örstan, respectively. The Coordinator would also like to thank all past and present contributors to the AMG newsletter, and to encourage everyone to submit short articles, abstracts of publications, book reviews, research news, conference reports, etc., for the next issue (**copy date mid-December 2010**) and future issues. All items and correspondence should be sent as Word documents to JRS at the email address given above.

Contents

Molluscs and Late Holocene archaeology in East Africa	1
Archaeomalacology in the making	3
<i>Papillifera papillaris</i> along the coast of the eastern Adriatic Sea	5
The third experimental necklace of prehistoric shell jewellery.	7
A cowry bead from Beer Meteq, Israel	10
Shells from Horvat Grarit, Negev, Israel	11
Shells from Horvat ‘Illin Tahtit, Bet Shemesh, Israel	12
Abstracts	13
John Evans Dissertation Prize	16
Conferences	17

Molluscs and Late Holocene Archaeology in East Africa

Jonathan R. Walz

Department of Anthropology, University of Florida, FL, USA

Email: jonwalz@ufl.edu

In Africa south of the Sahara, Pleistocene research continues to generate interest in Mollusca as subsistence resources or personal adornments for early “modern” humans (*Homo sapiens*) (e.g. Mehlman, 1979; Marean *et al.*, 2007; Klein, 2008). Molluscs at sites in tropical settings from more recent periods (Holocene), however, tend to receive less detailed attention from Africanist archaeologists (Msemwa, 1994), especially outside of marine environments. As researchers increasingly probe the later pasts of sub-Saharan Africa, shell artefacts and ecofacts will play a growing role in studies of economic exchange, craft production, and climate change, among other topics. In this vein, I report archaeomalacological finds from mainland Tanzania in East Africa.

A diverse group of molluscs inhabits contemporary northeastern Tanzania (Tanga and Kilimanjaro regions) (Emberton *et al.*, 1997; Richmond, 1997; Tattersfield *et al.*, 1998; Verdcourt, 1952, 1972). The mosaic environment of the region incorporates a coralline coastline (that abuts the western Indian Ocean), a lowland interior steppe, the Pangani (Ruvu)

watershed (>40,000 km²), and the dramatic Usambara and South Pare mountains (components of the Eastern Arc Range). Systematic excavations at Kwa Mgogo and Gonja Maore—lowland interior archaeological sites (>50 km from the Indian Ocean) that date to the last two millennia—yielded 58 kg of faunal remains, including >14 kg of mollusc shells (marine and non-marine species combined).

The systematic screening of matrix produced >225 marine shells from the Indian Ocean, including varieties of cowries (e.g. *Cypraea* [= *Monetaria*] *annulus*, *Cypraea* [= *Monetaria*] *moneta*, and *Marginella* sp.). Approximately 35% of marine specimens are modified (usually pierced), presumably to be worn as ornaments. In one instance, a detached cowry back appears ground to facilitate suspension from a cord. Other artefacts of non-local origin—glass beads (e.g. Indo-Pacific Trade Wind varieties), semi-precious stones (e.g. carnelian and agate), and ceramics (e.g. from the proximal Swahili Coast and the Middle East)—accompany shells and constitute a unique record of interaction between coastal (including Swahili, urban) and hinterland African communities of AD 750–1550.

The project also amassed 8.0 kg and 6.1 kg of non-marine specimens from Kwa Mgogo and Gonja Maore, respectively. Most of the >1600 objects of personal adornment (beads and baubles) recovered during excavations are fashioned from shells of *Achatina* sp. [*Achatina* sp. (Giant African Landsnail, probably *Achatina fulica* Ferussac, 1821) regularly grows to >20 cm (length) and >0.5 kg (weight).] Excavations yielded all stages of shell bead production: 1) shells with cut-outs, 2) rough disc pre-forms (blanks), 3) perforated pre-forms, and 4) finished disc beads with smoothed edges. Craft production appears to have occurred at the household scale given the extent and clustered distribution of beads on site surfaces. Indications of wider regional exchange (outlined above), however, suggest that production also may have met demands beyond those of site occupants.

In addition, distributions of molluscs within site strata offer proxy data about local climate change. At Kwa Mgogo, for instance, we catalogued nine types of non-marine molluscs totalling 524 MNI (minimum number of individuals). Although *Achatina* sp. is prominent, *Lanistes ovum* (Peters, 1845) and *Pila ovata* (Olivier, 1804) are profuse in strata post-dating AD 900. *L. ovum* and *P. ovata* are moderately amphibious and require water for sustenance and reproduction (both are gonochoristic), suggesting the launch of a comparatively wet phase at Kwa Mgogo by AD 900–1000. Putatively, residents collected non-marine molluscs near the (now seasonal) Mkomazi River and/or the (now perennial) Pangani (Ruvu) River and consumed them as food (and/or used their soft body parts rather than their shells). This interpretation explains the completeness of the shells of water-dependent specimens (whole or near whole and always unmodified, as compared to partial and modified *Achatina* sp.) as well as their high frequencies in post-AD 900 cultural strata.

Remains of Mollusca supply critical evidence that addresses questions about iron-using, farming, or mixed subsistence, communities during the African “Middle Iron Age” (AD 600–1000/1200). Marine specimens indicate regional exchange to a degree that might not have been predicted otherwise. Residents used shells of the Giant African Landsnail to fashion objects, such as beads. And proxy evidence of climate change (from the last millennium and a half) reinforces extant knowledge about wider eastern Africa (e.g. Karién *et al.*, 1999; Verschuren *et al.*, 2000). In countries like Tanzania—where insufficient funding for costly, machine-based analyses (e.g. trace element or oxygen isotope studies to investigate raw material exchange or climate, respectively) can be limiting—locating and identifying molluscs in archaeological settings can generate rich databases from which to build and challenge scientific narratives without great monetary expenditure.

Acknowledgements

I thank Dr Peter Kasigwa (Zoology Department, University of Dar es Salaam, Tanzania) for providing access to contemporary specimens, unpublished photographs, and documents related to East African molluscs. As a professional malacologist, Dr Kasigwa assisted me with specimen identifications.

References

- Emberton, K., Pearce, T.A., Kasigwa, P., Tattersfield, P. and Habibu, Z., 1997.** High diversity and regional endemism in land-snails of eastern Tanzania. *Biodiversity and Conservation*, 6: 1123-1136.
- Karién, W., Fastook, J.L., Holmgren, K., Malmström, M., Matthews, J.A., Odada, E., Risberg, J., Rosqvist, G., Sandgren, P., Shemesh, A. and Westerberg, L.-O., 1999.** Glacier fluctuations on Mount Kenya since ~6000 cal. years BP: implications for Holocene climatic change in Africa. *Ambio*, 28: 409-418.
- Klein, R.G., 2008.** Out of Africa and the evolution of human behavior. *Evolutionary Anthropology*, 17: 267-281.
- Marean, C.W., Bar-Matthews, M., Bernatchez, J., Fisher, E., Goldberg, P., Herries, A.I.R., Jacobs, Z., Jerardino, A., Karkanas, P., Minichillo, T., Nilssen, P.J., Thompson, E., Watts, I. and Williams, H.M., 2007.** Early human use of marine resources and pigment in South Africa during the Middle Pleistocene. *Nature*, 449: 905-908.
- Mehlman, M.J. 1979.** Mumba-Höhle revisited: the relevance of a forgotten excavation to some current issues in East African prehistory. *World Archaeology*, 11: 80-94.
- Msemwa, P.J., 1994.** *An ethnoarchaeological study on shellfish collecting in a complex urban setting.* Unpublished Ph.D. Dissertation, Brown University, Providence, Rhode Island, USA.
- Richmond, M.D. (ed.), 1997.** *A field guide to the seashores of eastern Africa and the western Indian Ocean islands.* Stockholm, Sweden, Department of Research Cooperation, SAREC/Sida.
- Tattersfield, P., Seddon, M.B., Meena, C., Kayumbo, N. and Kasigwa, P., 1998.** Ecology and conservation of the land-snails of the Eastern Arc Mountains. *Journal of East African Natural History*, 87: 119-138.
- Verdcourt, B., 1952.** Observations on the ecology of the land and freshwater Mollusca of north-east Tanganyika. *Tanganyika Notes and Records*, 33 (July): 67-82.
- Verdcourt, B., 1972.** The zoogeography of the non-marine Mollusca of East Africa. *Journal of Conchology*, 27: 291-348.
- Verschuren, D., Laird, K.L. and Cummings, B.F., 2000.** Rainfall and drought in equatorial East Africa during the past 1,100 years. *Nature*, 403: 410-414.

Archaeomalacology in the making: a wall of shells in Istanbul

Aydın Örstan¹ and Henk K. Mienis²

¹Section of Mollusks, Carnegie Museum of Natural History, 4400 Forbes Ave, Pittsburgh, Pennsylvania 15213, USA

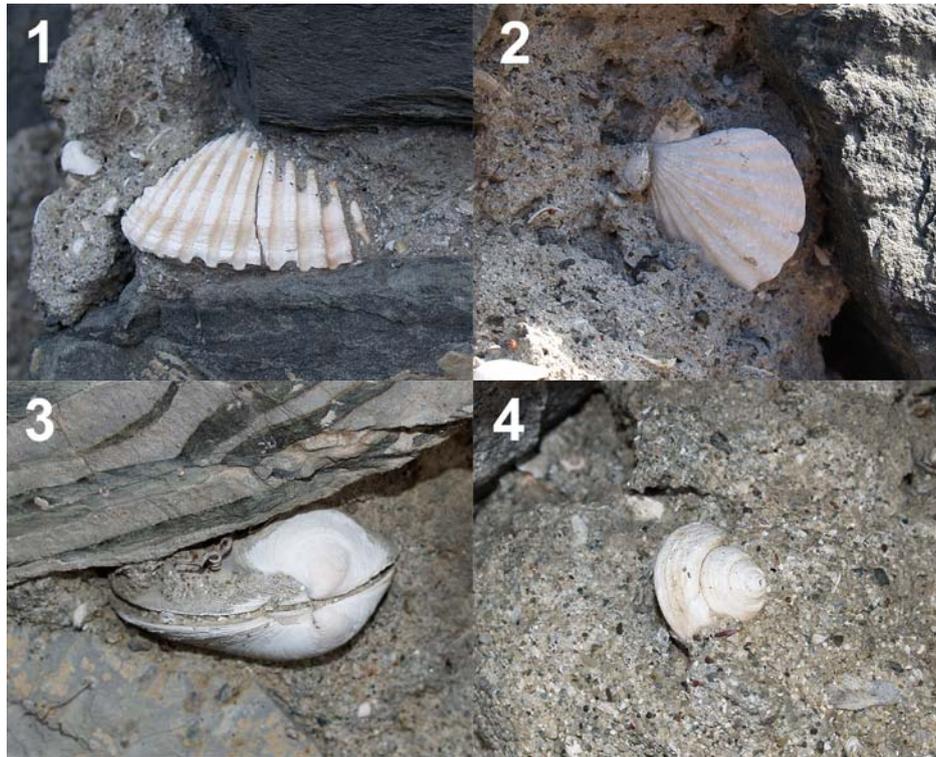
Email: pulmonate@earthlink.net

² National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, and National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem, Israel

E-mail: mienis@netzer.org.il

Concrete is a mixture of cement, water and filler. The paste that forms when cement is mixed with water hardens as it dries and binds the filler. For most ordinary building purposes, either gravel or sand is used as a filler.

During recent trips to Istanbul, Turkey, one of us (AÖ) has often walked past a wall surrounding a large residential complex in the Ulus district of the city that was probably built during the last 15 years or so. On this wall many marine shells are on display, not orderly and in full view—as one would see in a museum—but haphazardly and partially embedded in the concrete holding the wall together. It appears that the builder had obtained the sand for the concrete from a beach.



The visible shells in the wall are mostly bivalves, but there are also occasional gastropods. From photographs of some of them taken in 2008, HKM identified the bivalves *Acanthocardia echinata* (Fig. 1), *Flexopecten glaber* (Fig. 2), *Dosinia lupinus* (Fig. 3), *Ostrea edulis* or *Ostreola stentina* (impossible to identify with certainty from the exterior), *Venus verrucosa*, and the gastropod *Gibbula albida* (Fig. 4). Undoubtedly, there are others in sections of the wall not visible from the street and also buried deep inside the concrete.

All of the species in this assemblage have been recorded from the Sea of Marmara to the south of the city (Oberling, 1971; Albayrak *et al.*, 2004). This suggests that the sand used for the concrete had been taken—probably illegally—from a beach along the coast of the Marmara.

We can fantasize about the discovery of the fragments of this wall during a dig a few thousand years from now. If the future archaeologists succeed in dating the wall, not only will the surviving pieces of shells embedded in the concrete reveal a particular building practice of a bygone era but they will also help archaeomalacologists reconstruct the past fauna of the nearby sea.

These future archaeomalacologists may even write about their results in their newsletter!

References

- Albayrak, S., Balkis, H. and Balkis, N., 2004. Bivalvia (Mollusca) fauna of the Sea of Marmara. *Acta Adriatica*, 45: 9-26.
- Oberling, J., 1971. On the littoral Mollusca of the Sea of Marmara. *Jahrbuch Naturhistorisches Museum Stadt Bern*, 4: 183-218.
-

Supplementary information concerning the presence of *Papillifera papillaris* along the coast of the eastern Adriatic Sea

Burçin Aşkim Gümüş¹ and Henk K. Mienis²

¹Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, Teknikokullar, Beşevler-Ankara, TR-06500, Turkey

Email: burcinaskim@gmail.com; burcinaskim@gazi.edu.tr

² National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, and National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem, Israel

E-mail: mienis@netzer.org.il

Introduction

Recently we presented a review of mainly literature records of the clausiliid species *Papillifera bidens* from localities along the eastern Adriatic Sea (Gümüş and Mienis, 2009). According to these data, this invasive species occurs almost exclusively on walls dating to the Hellenistic, Roman or Medieval periods, i.e. it is often found in ancient building structures or at archaeological sites.

We used the name *Papillifera bidens* in spite of the fact that Kadolsky (2009) had already pointed out that *Papillifera bidens*, originally described as *Turbo bidens* by Linnaeus (1758), had been misinterpreted for over 250 years as being a senior synonym of *Papillifera papillaris* (Müller, 1774). According to his bibliographic studies and the selection of a neotype for *Turbo bidens*, the latter is now considered to be a senior synonym of *Cochlodina (Procochlodina) incisa* (Küster, 1876). This means that our *Papillifera* species has once again officially to be called *Papillifera papillaris* (Müller, 1774), which opinion has been confirmed by Bank (in litt.).

In the meantime, we have received additional data from several colleagues concerning finds of *Papillifera papillaris* in countries along the eastern Adriatic based on material in their private collections. These additional data are here presented in the same form as in our previous study, based on samples in the collections of:

HNHM = Hungarian Natural History Museum (Budapest, Hungary)

JG = Jozef Grego (Banská Bystrica, Slovakia)

LK = Lubosh R. Kolouch (Hradec Kralove, Czech Republic)

MS = Miklos Szekeres (Szeged, Hungary)

PR = Peter L. Reischütz (Horn, Austria)

PS = Peter Subai (Aachen, Germany)

ZE = Zoltán Péter Eröss (Budapest, Hungary)

Croatia

Kanfanar, Limska Draga viaduct, south side, leg. Z.P. Eröss and Z. Fehér, 7 April 1994 (ZE); Rovinj, south-west of the town, on walls of the cemetery, leg. W. Stephen, April 1979 (PS); Vodnjan, leg. P.L. Reischütz, 1967-1996 (PR); Fažana, leg. P.L. Reischütz, 1967-1996 (PR); Loborika, leg. P.L. Reischütz, 1967-1996 (PR); Pula, walls of the colosseum, leg. W. Fauer, 16 April 1973 (PS); Premantura, leg. P.L. Reischütz, 1967-1996 (PR); Liznjan, leg. P.L. Reischütz, 1967-1996 (PR); Medulin, leg. P.L. Reischütz, 1967-1996 (PR); Valtura, leg. P.L. Reischütz, 1967-1996 (PR); Labin, walls of the castle, leg. P.L. Reischütz, August 1967 (PR); Rabac, on stone walls along the street, leg. P.L. Reischütz, August 1967 (PR); Split, Jadro Springs, on walls near the springs, leg. P.L. Reischütz, March 2010 (PR); idem, eastern walls of Diocletian's Palace, some worn specimens seen but not collected by J. Grego, September 2001; Omiš, old walls, leg. P.L. Reischütz, March 2010 (PR); Brač Island, Selca, in the centre

of the village in a gap in the stone wall near a garden, leg. J. Grego, 11 September 2003 (JG); Hvar, Vrboska, walls in the town, leg. P.L. Reischütz, May 1976 (PR); idem, just outside the city of Hvar, leg. Z.P. Eröss, 30 August 1982 (ZE); Opuzen, in debris of the Neretva river, leg. P.L. Reischütz, March 2010 (PR); idem, in the Neretva valley, on walls of the town, leg. P.L. Reischütz, March 2010 (PR); Ombla Springs, east of Dubrovnik, among ruins, leg. P.L. Reischütz, April 1973 (PR); Dubrovnik, leg. H. Gyurkovics and M. Szekeres, July 1976 (MS); idem, Lapad, leg. H. Gyurkovics and M. Szekeres, July 1976 (MS).

Table 1: Additional localities of *Papillifera papillaris* in countries along the east coast of the Adriatic Sea, their modern and some of their alternative names and the presence of ruins from Hellenistic, Roman, Byzantine, Medieval or Ottoman periods (according to information derived from the website <http://en.wikipedia.org>)

Locality	Alternative name	Archaeological remains
Kanfanar	Canfanaro	No information
Rovinj	Ruginium, Ruvinium, Rovigno	Roman
Vodnjan	Vicus Attinianum, Dignano	Roman, Medieval
Fažana	Fasana	No information
Loborika		No information
Pula	Pola, Pulj	Roman
Premantura		Roman
Liznjan	Lisignano	Medieval
Medulin	Medolino	No information
Valtura		No information
Labin	Albona	No information
Rabac	Porto Albona	No information
Split	Aspálathos, Spalata, Spalato	Hellenistic, Roman
Omiš	Oneum, Holm, Olmisi, Almissa	Byzantine, Medieval
Brač Island	Bretia, Brazza, Bratz	Greek, Roman, Medieval
Hvar	Pharos, Pharina, Lesina	Hellenistic, Roman
Opuzen		Roman, Medieval
Ombla Springs	Umbla	No information
Dubrovnik	Ragusa, Raiyia	Greek (?), Byzantine, Medieval
Herceg-Novi	Castelnuovo, Meljine	Medieval
Kotor	Cattaro	Roman
Ulcinj	Ulqin, Ulqini	Greek, Roman
Bojana	Buna	No information
Berat	Berati, Bel(i)grad, Bellegrada	Greek, Roman, Byzantine, Ottoman
Sarandé	Bothrata, Butrinto, Buthrint	Greek, Roman, Byzantine

Montenegro

Herceg-Novi, on the south and south-western walls of Sponjula Castle, leg. P. Subai, 10 October 2004 (PS); Kotor, ex K. Brancsik (HNHM); Ulcinj, on the walls of the castle, leg. Z.P. Eröss and Z. Fehér, 20 April 2000 (ZE); Bojana River, church of Sv. Nikola, opposite the island of Bojana Ada, leg. P.L. Reischütz, March 2010 (PR).

Albania

Berat, on walls of the castle, leg. Z.P. Eröss and Z. Fehér, 5 July 1996 (ZE); idem, in meadow in front of the castle, leg. P.L. Reischütz, March 2010 (PR); Sarandé, Lekuresse Castle, leg. L.R. Kolouch (LK); idem, St. Nikolaj Monastery, leg. L.R. Kolouch (LK).

Discussion

In our previous review (Gümüş and Mienis, 2009) we have shown that the invasive clausiliid species *Papillifera papillaris* (as *P. bidens*) occurs at many localities along the entire eastern Adriatic coast. Most of these localities are characterized by the presence of remains dating back to the Hellenistic, Roman, Byzantine, Medieval and Ottoman periods. This allowed us to reach the conclusion that this Italian land snail most probably arrived at these localities during these historic periods as a hitchhiker on material imported from Italy.

Through the courtesy of some of our colleagues, who frequently collect land snails in the countries bordering the eastern Adriatic Sea, we have been able to considerably increase the number of localities where *Papillifera papillaris* has been found. Although most of the new localities are again situated in the coastal area, this time some populations were encountered quite far inland. This is especially the case with Berat in Albania, which is situated some 55 km from the nearest Adriatic coast. Péter Eröss and Zoltán Fehér collected it on the walls of the ancient Turkish castle in 1996, while Peter Reischütz encountered it in a meadow in front of the castle, which unfortunately is now being used as a refuse dump.

Acknowledgements

We would like to thank our colleagues Mag. Peter L. Reischütz, Dr Zoltán Péter Eröss, Dr Zoltán Fehér, Jozef Grego, Lubosh R. Kolouch, Peter Subai and Miklos Szekeres for sharing the data from samples in their collections with us and Prof. Ruud Bank for confirming the correct name of the discussed clausiliid species.

References

- Gümüş, B.A. and Mienis, H.K., 2009. The *Papillifera bidens*-complex along the eastern Adriatic Sea. *Archaeo+Malacology Group Newsletter*, No. 16: 3-7.
- Kadolsky, D., 2009. *Turbo bidens* Linnaeus 1758 (Gastropoda: Clausiliidae) misidentified for 250 years. *Journal of Conchology*, 40 (1): 19-30.
- Linnaeus, C., 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locus*, 1. Edit. 10. Holmiae, Laurentius Salvius. 824 pp.

Introduction of the third experimental necklace of prehistoric jewellery components

Paulette Pauc

Recherches et Développement Culturel en Corbières, 11220 Coustouge, France

Email: paulettepauc@gmail.com

Summary

Jewellery components were experimentally made in imitation of prehistoric examples, based on archaeological, geological and biological data, using mid-Quaternary subfossil and recent bivalves, gastropods and scaphopods, blade-like limestone pendants and *Prunus spinosa* nuts. These components were strung on a linen suspension cord compatible with the Chalcolithic period. This necklace of beads and pendants showed various changes after being worn daily for one month. The results will be compared with prehistoric jewellery showing different types of wear. [Illustrations of the necklace can be seen on Paulette Pauc's blogsite at <http://art-archeologie.over-blog.fr>]

Introduction

The third experimental necklace comprised 74 components and the different categories were arranged at random. This assemblage was mostly made up of subfossil marine shells found in

the Eutyrrhenian layer, which represents a warm period in the mid-Quaternary at the maximum marine elevation in the Mediterranean around 129,000 bp (Ambert *et al.*, 1993).

This shelly deposit includes numerous species and varieties of molluscs which lived in an environment with a sandy bottom or on a rocky substrate. At the present time they can be found in ancient beach deposits in Aude, France, between 3 and 6 m elevation. The dominant species is *Cerastoderma glaucum*, the Glaucous Cockle, often wrongly called *Cardium* which gives the deposit the name of 'Cardium beach'. Other common shells are *Cerithium vulgatum*, *Hexaplex trunculus*, *Monodonta turbinata* [= *Osilinus turbinatus*] and *Nassa* [= *Hinia*] *reticulata*, in different degrees of preservation. The Audean deposits do not include *Columbella rustica* and *Conus mediterraneus*, and these shells were collected from a present-day beach on the rocky coast of the eastern Pyrenees. Tubes of *Dentalium* [= *Antalis*] spp., both smooth and ribbed, shells of *Trivia monacha*, and a shell fragment of *Acanthocardia tuberculata* rolled by marine action also came from a present-day beach. In addition, I included some nuts of *Prunus spinosa*, the wild Blackthorn, and some blade-like pendants made from chips of marble.

The suspension thread was made from commercial linen tow, which is used to plug and seal joints in plumbing. This material was not submitted to great modification; it was sufficient to draw out the quantity of thread necessary to make a cord of two strands and of the desired length.

The subfossil shells

Cerastoderma glaucum: one valve was perforated at the umbo by abrasion on a piece of sandstone. The opening was enlarged with a flint point to obtain a regular hole with a neat edge. In addition, fifteen discs with different diameters were made for threading from valves of various thicknesses, as used in previous studies (Pauc, 1997, 2000; Pauc *et al.*, 2004).

Hexaplex trunculus: of the six examples, one had been broken by marine action and retained only part of the last whorl and the intact natural opening, and another was a juvenile specimen with a very thin shell.

Cerithium vulgatum: of the five shells, one was rolled and another was holed opposite the natural opening by marine action on the relief part of the last whorl.

Monodonta turbinata: of the four examples, one of them was broken by marine action and only retained the last whorl with its natural opening.

Nassa reticulata: of the four shells, two had lost all of the early whorls and another was only represented by a very damaged last whorl.

The modern shells

Columbella rustica: of the six examples, two specimens presented holes caused by marine action. One had only a small hole in the wall of the last whorl and the other had a major break. Two other specimens, broken just before the last whorl, were perforated with a flint point.

Conus mediterraneus: all six examples were naturally worn at the apex and this has created holes. One of them had a damaged aperture and another had lost part of the last whorl and columella; the edges of the breaks were worn smooth.

Dentalium spp.: the six tusk shells were useable as found.

Trivia monacha: of the four specimens, one of them had been perforated by marine action.

The gastropods, subfossil or recent, that had not been naturally holed by marine action, were first abraded, generally on the body whorl opposite to the aperture, and then perforated with a flint point. This two-stage procedure was necessary in order to obtain a hole similar to that found in archaeological specimens. At microscopic level in transverse section, the shell has an

external ornamented fibrous layer and a uniform intersecting inner layer. Depending on the thickness of the shell and its degree of surface wear, a flint point will not usually be able to pierce the shell directly.

The blade-like pendants

Three types of blade-like pendants were the outcome of a series made within the framework of a previously published experiment (Pauc *et al.*, 2005; Pauc, 2006).

The Blackthorn nuts

The shrub *Prunus spinosa* produces fruits or sloes, the kernels or nuts of which were used to make beads in the Neolithic (Schlichtherle, 1988). This perishable material is only preserved in a lacustrine context in the absence of oxygen. The 11 beads used in the experimental necklace were made by abrading the sides of the nuts to reduce the thickness of the test before piercing a hole with a flint point.

The cord

The suspension thread was made of linen because the flax plant is well represented in the Chalcolithic. The analysis of the fibres of a preserved garment attests to its use (Ayala, 1987). The cord was made according to the method of Reinhard (1997). Two strands were used to make a cord with the formula S-2 – Z, which produced a thread of the desired thickness and length. The thread varied in diameter from 0.72 to 0.96 mm where some fibre joins resulted in a wider than average diameter. However, even the maximum diameter permitted the threading of shells with very small holes.

Once the beads and pendants were threaded, the length of the necklace was limited to 60 cm leaving an excess of thread that could be used to repair the suspension cord in case it broke as the result of wear. The jewellery components occupied 48 cm of the length of the cord. The remaining 12 cm of thread was worn at the back of the neck directly in contact with the skin.

The results of prolonged wear

Prolonged wear for the period of one month resulted in different types of wear on the cord. The length directly in contact with the skin presented a very slow rupture of the superficial fibres in the middle of the twists. At the level of the first small *Conus* and *Dentalium* beads and the blade-like pendants, the rupture of the superficial fibres was more noticeable and the broken fibres stuck out from each twist. The subfossil shells cut the superficial fibres to an even greater extent and this gave a bushy appearance to certain parts of the twists. This aspect of deterioration of the fibres has previously been described in the hole of a prehistoric copper bead (Rouquerol, 2004). This wear reduced the profile of the twists which then appeared elongated or stretched. In contrast, where some recent shells had moved very little on the thread, there were very few ruptures of the superficial fibres.

Among the jewellery components, a localised polish was observed on the faces of the shell discs, which gave a shine to their surface sculpture. The subfossil gastropods showed some wear localised around the natural openings where they were in contact with the suspension cord. This slight superficial abrasion was shiny white in colour against the surface of the depigmented shell which was beige to off-white. No such characteristic wear was seen on the recent shells, except for the *Columbella rustica* that had been very degraded by marine action at the level of the last whorl: here the suspension thread had formed a small notch in the broken edge. The *Prunus spinosa* nuts showed a shiny polish at the level of the abraded surfaces around the holes.

Conclusion

The results obtained during this new experiment are not final. The necklace will continue to be worn until the thread breaks and is repaired, and the final outcome will be described in a future publication.

References

- Ambert, P., André, J., Boutié, P., Leroy, S. and de Lumley, H., 1993.** Corbières littorales, complexe scientifique de Tautavel. Livret guide de l'excursion 1993 en Languedoc de l'Association française pour l'Étude du Quaternaire, Aix-en-Provence. *Études de Géographie physique*, XXII (Suppl.): 59-65.
- Ayala, J.M.M., 1987.** Enterramientos calcolíticos de la Sierra de la Tercia, Lorca, Murcia. Estudio preliminar. *Anales de Prehistoria y Arqueología, Universidad de Murcia*, 3: 9-24.
- Pauc, P., 1997.** Reproduction de perles circulaires réalisées en test de *Cerastoderma edule*. *Journées d'Archéologie Expérimentale du Parc de Beynac (Dordogne, F.) 1996-1997*, Bilan no.1: 7-66, 124 figs.
- Pauc, P., 2000.** Activité de fabrication protohistorique de parures en coquillages marins. *Bulletin de la Société d'Études Scientifiques de l'Aude*, CC: 23-28, 3 figs.
- Pauc, P., 2006.** Conception expérimentale de la pendeloque à ailettes globulaires à partir d'une typologie évolutive. Hommes et Passé des Causses, Colloque de Millau 2005. *Archives d'Ecologie Préhistorique Toulouse*, 2006: 315-321.
- Pauc, P., Bohic, D. and Fauré, Ph., 2004.** Brève typologie de l'outillage lithique inhérent à la fabrication de parures protohistoriques en coquillages et les sources de matières. *Bulletin de la Société d'Études Scientifiques de l'Aude*, CIV: 69-76.
- Pauc, P., Moinat, P. and Reinhard, J., 2005.** Description de la fabrication expérimentale du grain d'enfilage en akène de *Lithospermum* de type 2 et de la pendeloque à ailettes globulaires. *EuroREA*, 2: 40-54.
- Reinhard, J., 1997.** Faire une cordelette à deux brins. *ARKEO Junior*, No. 34: 21.
- Rouquerol, N., 2004.** Du Néolithique à l'Age du Bronze dans les Pyrénées centrales française. *Archives d'Ecologie Préhistorique, Toulouse*, No. 16: 191 pp.
- Schlichtherle, H., 1988.** Neolithische Schmuckperlen aus Samen und Fruchtsteinen. In: Küster, H. (ed.), *Der prähistorische Mensch und seine Umwelt: Festschrift für Udelgard Körber-Grohne zum 65. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg, Stuttgart*, 31: 199-203.

This article is a translation (by JRS) of:

Pauc, P., 2009. Présentation du troisième ensemble expérimental de parure préhistorique. In: Roussel, B., Texier, P.-J. and Dumas, C. (eds), *Langage de pierre, la restitution du geste en préhistoire. Colloque européen, Baux de Provence, octobre 2009*. Maison Cazenave, Baux de Provence, Musée des Baux. pp. 36-39.

A cowry bead from Beer Meteq, Israel

Henk K. Mienis

National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, and National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem, Israel

Email: mienis@netzer.org.il

One of the ways to turn a cowry shell into a shell bead is to remove its dorsum either by pounding or grinding or a combination of both. In this way it is easy to thread the beads, to stitch them to clothes or to attach them to a charm. This process in the manufacture of cowry beads has been used over and over again in the Levant since at least the Natufian period, and probably much earlier, until the present time. Among certain Bedouin tribes a charm including a cowry bead is still attached to new-born babies, especially to girls, as it has always been considered a symbol of fertility.

It is therefore not surprising that cowry beads are regularly found during archaeological digs in Israel. However, because of the long tradition of wearing cowry beads in one form or for one reason or another, you can also come across them at non-archaeological sites throughout the country. Especially after heavy rains, it is worthwhile to check gullies in arable fields near

old settlements or in the vicinity of springs and waterholes in desert areas. At my home, Kibbutz Netzer Sereni, near the town of Ramla, I have found in this way over the years dozens of such cowry beads made of *Monetaria moneta* (Linnaeus, 1758) and *Monetaria annulus* (Linnaeus, 1758). Archaeological sites have not been recognised so far in this area; however, for many centuries the fields have been tilled by the local Arab fellaheen.

A few days ago I received from Oren Kolodny, a MSc student at the Hebrew University of Jerusalem, some land snails which he had collected on 26 March 2010 near Beer Meteq, a well at the head of Nahal Milhan, south of Biq'at Uvda, in the southern Negev. To my surprise they also included a perfect example of a cowry bead made from *Erosaria nebrates* (Melvill, 1888). This cowry species is abundant in the Gulf of Aqaba some 32 km south of Beer Meteq.

Although Biq'at Uvada and the nearby Arava Valley are well known for their numerous archaeological sites, as far as I know an excavation has never been carried out in the Beer Meteq area. Today this well carries water only when it is raining during the winter. However, most probably in the past, before the Early Islamic period, it contained water the whole year round as did most of the springs and wells in that area, and formed an intensively frequented watering place along the ancient road which passes near Beer Meteq. Until an excavation takes place near that well, we can only guess the age of that cowry bead.

I would like to thank Oren Kolodny for donating the discussed material to the National Mollusc Collection of the Hebrew University of Jerusalem.

Shells from Horvat Grarit, Negev, Israel

Henk K. Mienis

National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, and
National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem,
Israel

E-mail: mienis@netzer.org.il

Horvat Grarit (=Khirbet Umm Jerrâr) is situated about 5 km west of Kibbutz Be'eri, north-west Negev, Israel, just east of Nahal Besor. Among archaeologists it is known for the ruins of a Byzantine church and a nice mosaic floor.

On 26 March 2010 Oren Kolodny, a student at the Hebrew University of Jerusalem, visited this site and collected some molluscs from among the ruins. They can be divided into land snails and marine molluscs.

Terrestrial molluscs

The following terrestrial snails were found among the ruins: *Euchondrus septemdentatus* (Roth, 1839), *Sphincterochila aharonii* (Kobelt, 1913), *Monacha obstructa* (Pfeiffer, 1842), *Monacha syriaca* (Ehrenberg, 1831), *Xerocrassa simulata* (Ehrenberg, 1831), *Xeropicta vestalis joppensis* (Schmidt, 1855), and *Helix engaddensis* Bourguignat, 1852.

These are all common species which are still living in the vicinity of the site, although *Sphincterochila aharonii* is better known as an inhabitant of the coastal kurkar (=a local sandstone) hills.

Marine molluscs

The marine molluscs were represented by three species only: *Cerithideopsisilla conica* (Blainville, 1826), two specimens; *Glycymeris insubrica* (Brocchi, 1814), three complete

valves, one valve with a tiny hole in the umbo and a small fragment; and *Cerastoderma glaucum* (Poiret, 1789), one very old abraded valve which shows a large hole in its umbo.

All three species are from the Mediterranean Sea, which is situated some 8.5 km north-west of the site. The most interesting species is without doubt *Cerithideopsilla conica*, which was until recently better known as *Pirenella conica* or *Potamides conicus*. Inadvertently, it has been considered by some as a Red Sea migrant into the Mediterranean Sea. This is not correct, because it is well known from some Pleistocene and even older deposits here and there in the Mediterranean area. However, it has always been a rather local species usually confined to either the brackish estuaries of rivers, hyper-saline lagoons or land-locked saline lakes. The specimens of *Cerithideopsilla conica* found at Horvat Grarit originated most probably from the estuary of Nahal Besor from a time when this river carried more water than today. This is probably also true for *Cerastoderma glaucum*, the old abraded valve of which might have served as a pendant at some time. None of the other marine species showed any traces of manipulation.

Thanks are due to Oren Kolodny for collecting the discussed material.

Shells from Horvat 'Illin Tahtit, a late Early Bronze I site in Bet Shemesh

Henk K. Mienis

National Collections of Natural History, Department of Zoology, Tel Aviv University, IL-69978 Tel Aviv, and
National Natural History Collections, Berman Building, Hebrew University of Jerusalem, IL-91904 Jerusalem,
Israel

E-mail: mienis@netzer.org.il

Horvat 'Illin Tahtit (=Khirbet Wady Alin; Khirbet Wad'Illin), is a late Early Bronze I site located today within the township of Bet Shemesh, Israel. The site has been excavated most recently by Dr Eliot Braun. During that excavation, ten samples of shells were recovered and preserved for further study. All the material could be identified on the spot, in spite of the fact that all the samples consisted of a single fragment of either a shell or a valve:

Gastropoda

Family Conidae

Conus species

Locus 320: a highly abraded specimen, which did not allow a more specific identification.

Family Helicidae

Levantina spiriplana hierosolyma (Mousson, 1854)

Locus 1005: a small fragment.

Bivalvia

Family Glycymerididae

Glycymeris pilosa (Linnaeus, 1767)

Locus ? (Basket 470): a fragment of the ventral margin.

Family Mutelidae

Chambardia rubens arcuata (Cailliaud, 1823)

Locus 108: a small fragment;

Locus 115: a fragment;

Locus 168: a disintegrated umbo of a valve;

Locus 194: a small fragment;

Locus 283: a large, disintegrated part of the ventral side;
Locus 325: a fragment of the umbo;
Locus 1005: a small fragment of the ventral margin.

Remarks

Only four different species were present among the recovered material; however, they originated from at least three different areas. *Levantina spiriplana hierosolyma* is a local land snail living exclusively among rocks. Since it is still living today in or near the site, the fragment found at locus 1005 might be of much more recent origin. *Glycymeris pilosa* is a marine bivalve confined in its distribution to the Mediterranean Sea, while *Chambardia rubens arcuata* is a freshwater mussel from the river Nile in Egypt. The cone shell originated either from the Mediterranean or the Red Sea.

Since none of the shells is complete or shows any sign of manipulation, it is impossible to judge whether they were brought to the site for a specific purpose. The fact, however, that Mediterranean and Nilotic species were present at the site shows that the people living at Horvat 'Illin Tahtit most probably maintained trade contacts with those areas, which is confirmed by the presence of imported Egyptian pottery (Braun, in litt.). The presence of mussels from the Nile and Egyptian pottery seems to be quite characteristic for sites dating to either the Chalcolithic or Early Roman I period.

Acknowledgement

I would like to thank Dr Eliot Braun for giving me the opportunity to look at the discussed material.

Abstracts

Ashkenazi, S., Klass, K., Mienis, H.K., Spiro, B. and Abel, R., 2009. Fossil embryos and adult Viviparidae from the Early-Middle Pleistocene of Gesher Benot Ya'aqov, Israel: ecology, longevity and fecundity. *Lethaia*, 43: 116-127.

ABSTRACT: A fossil assemblage of the freshwater viviparids *Viviparus apameae galileae* and *Bellamya* sp. with intact embryos was found in the sedimentary sequence above the Matuyama Brunhes Boundary at 0.78 Ma, at the Early Middle Pleistocene site of Gesher Benot Ya'aqov (GBY), Israel. This unique assemblage enabled certain ecological parameters developed for extant populations to be applied to fossil populations of extinct taxa to obtain insight into their palaeoecology. The fossil assemblage is related to a lake shoreline habitat that was desiccated by a sudden drop in water level. Shell increments allowed longevity to be estimated as at least nine years for *Viviparus* and eight years for *Bellamya*. The high number of both reproducing females and embryos, which were detected by scanning methods, indicated a favourable environment for both species. The GBY fossil viviparids showed the characteristics of K-selected populations. (JRS)

Boaretto, E., Mienis, H.K. and Sivan, D., 2010. Reservoir age based on pre-bomb shells from the intertidal zone along the coast of Israel. *Nuclear Instruments and Methods in Physics Research B*, 268: 966-968.

ABSTRACT: The colonial vermetid gastropod *Dendropoma petraeum* forms reef-like structures at the outer edge of the shore abrasion platform. The contacts between the first *Dendropoma* settlement and the substrate are now situated at depths of 10-20 cm below present sea level at sites along the Mediterranean coast of Israel and indicate low rates of sea level rise over the last 10-12 centuries. The ¹⁴C dates obtained for the earliest *Dendropoma* raised questions concerning the radiocarbon reservoir age for the intertidal zone. Attempts

were made to determine the reservoir age (R) by radiocarbon dating of museum specimens of four species of molluscs representing different depths and habitats in the intertidal zone at four sites between Haifa and Tel Aviv: *Melaraphe neritoides* ($R=364\pm 54$ years), *Patella caerulea* ($R=174\pm 54$ years), *Osilinus turbinatus* ($R=219\pm 54$ years) and *Columbella rustica* ($R=269\pm 54$ years). All these shells were live-collected before 1937 and therefore represent material from the pre-nuclear bomb era. (JRS)

Gümüş, B.A., 2010. Searching for *Lindholmiola lens* (A. Férussac, 1832) (Mollusca, Gastropoda, Stylommatophora) in Western Anatolia. *Triton*, No. 21: 31-34.

ABSTRACT: Some new localities are reported for the helicodontid land snail *Lindholmiola lens* in Western Anatolia, which extend its range from Albania, Macedonia, Aegean islands and western parts of Anatolia as far south-east as Kiriş, Kemer-Antalya, in the Mediterranean region of Turkey. This species is considered to be Balkan in origin and in Anatolia it is frequently associated with ruins. Its preferred habitat is calcareous soil surrounding limestone rocks, and it is possible that it was dispersed through the agency of construction material used in ancient settlements. (JRS)

Patterson, W.P., Dietrich, K.A., Holmden, C. and Andrews, J.T., 2010. Two millennia of North Atlantic seasonality and implication for Norse colonies. *Proceedings of the National Academy of Sciences of the USA*, www.pnas.org/cgi/doi/10.1073/pnas.0902522107

ABSTRACT: The $\delta^{18}\text{O}$ values of molluscs recovered from near-shore marine cores in north-west Iceland quantify significant variation in seasonal temperature over the period from c. 360 BC to c. AD 1660. Twenty-six aragonitic bivalve shells, representing the genera *Astarte*, *Macoma*, *Nuculana*, *Tellina* and *Thyasira*, were selected to represent intervals of climatic interest by using core sedimentological characteristics. Carbonate powder was sequentially micromilled from shell surfaces concordant with growth banding and analysed for stable oxygen ($\delta^{18}\text{O}$) and carbon ($\delta^{13}\text{C}$) isotope values. Because $\delta^{18}\text{O}$ values record subseasonal temperature variation over the life time of the bivalves, these data provide the first 2000-year secular record of North Atlantic seasonality from c. 360 cal yr BC to cal yr AD 1660. Notable cold periods (360 to 240 BC, AD 410, and AD 1380 to 1420) and warm periods (230 BC to AD 140, and AD 640 to 760) are resolved in terms of contrast between summer and winter temperatures and seasonal temperature variability. Literature from the Viking Age (c. AD 790 to 1070) during the establishment of Norse colonies (and later) in Iceland and Greenland permits comparisons between the $\delta^{18}\text{O}$ temperature record and historical records, thereby demonstrating the impact of seasonal climatic extremes on the establishment, development and, in some cases, collapse of societies in the North Atlantic. (Mostly authors' summary)

Reese, D.S., 2008. Appendix B. (1) Recent and fossil shells from Paralimni-Nissia. pp.119-153. In: Flourentzos, P. (ed.), *The Neolithic settlement of Paralimni*. Lefkosia, Department of Antiquities, Cyprus.

ABSTRACT: Five seasons of excavation (1995-2001) at the coastal Late Neolithic site of Paralimni-Nissia in eastern Cyprus produced a large hand-collected assemblage of marine and fossil invertebrates. The recent marine gastropods comprised 491 (MNI) *Patella* sp., 57 *Monodonta* [= *Osilinus*] sp., 58 *Charonia* sp., 48 *Hexaplex trunculus*, 40 *Tonna galea*, 20 *Phalium* sp. (including eight 'cassid lips'), 14 *Bivonia* sp., 10 *Luria lurida*, 5 *Conus mediterraneus*, 4 *Stramonita haemastoma*, 3 *Cerithium vulgatum*, 2 *Euthria cornea*, 2 *Cymatium parthenopium*, 2 *Fasciolaria lignaria*, 1 *Columbella rustica*, 1 *Fusus* sp. and 2 unidentified. The bivalves were 97 *Spondylus gaederopus*, 42 *Glycymeris* sp., 4 *Pinna nobilis*, 3 *Cerastoderma glaucum*, 3 *Arca noae*, 2 *Acanthocardia tuberculatum*, 1 *Callista chione* and 1 *Tapes* [= *Paphia*] *aurea*. At least seven and possibly 10 of the *Charonia* shells had been made into vessels. Several of the gastropods are holed and could have functioned as

ornaments. The 74 unmodified fossil fragments were mostly (62) recent genera of marine bivalves. The eight land snails (*Helix* and *Eobania* spp.) are considered intrusive. (JRS)

Reese, D.S., 2008. Recent marine invertebrates, fresh-water shells, fossils, and fish from Kalavassos-Tenta. *Report of the Department of Antiquities, Cyprus*, 2008: 33-66.

ABSTRACT: This report describes 506 marine shells (364 gastropods, 80 bivalves, 62 dentalia), 2077 freshwater *Melanopsis* and 841 fossils (from local raised Pleistocene beaches) recovered from excavations at the Aceramic Neolithic site of Kalavassos-Tenta, which today is 3.2 km from the south-central coast of Cyprus. Only 73 (16.4%) of the gastropods and bivalves are believed to represent food remains: 24 *Monodonta* [= *Osilinus*], 6 *Gibbula*, 5 *Patella*, 1 *Euthria*, 1 *Cerithium*, 22 cockles (*Cerastoderma* and *Acanthocardia*), 3 *Venus*, 3 *Glycymeris*, 3 *Spondylus*, 2 *Arca*, 2 Arcidae and 1 ?*Mytilus*. In contrast, the total shell ornament assemblage includes 86 dentalia (both recent and fossil), 67 *Columbella*, 26 *Conus*, 32 *Murex* [= *Hexaplex*] *trunculus*, 5 *Thais* [= *Stramonita*], 4 *Cerithium*, 4 *Arcularia*, 2 *Murex* [= *Bolinus*] *brandaris*, 2 *Euthria*, 1 *Cymatium* and over 700 straight fossil vermetids. Of the 67 *Charonia* represented, 12 are thought to have been made into vessels. Most of the *Melanopsis* came from ditch deposits. In no case were shells associated with burials. (JRS)

Reese, D.S., 2009. On incised scapulae and *Tridacna*. pp.188-193. In: Aviram, J., Ben-Tor, A., Ephal, I., Gitin, S. and Reich, R. (eds), *Eretz-Israel: archaeological, historical and geographic studies*, 29. Jerusalem, Israel Exploration Society (Ephraim Stern volume).

ABSTRACT: Some examples of incised *Tridacna* shells from various Iron Age sites in the eastern Mediterranean and Near East are briefly reviewed. Twenty-five pieces include the carved head of a woman or siren on the umbo of the shell, and four have the carved head of a bird (raptor). A unique *Tridacna squamosa* from Israel had been carved in the form of a stylised swimming turtle. A previously unpublished type of *Tridacna* shell carving is illustrated and described from a site near Byblos in Lebanon. This depicts the head of a roaring lion on the umbo, and parallels are drawn with the Iron Age 'lion bowls' of ivory, faience, stone and pottery, which have a similar distribution to the carved *Tridacna* shells. (JRS)

Reese, D.S. and Betancourt, P.P., 2008. The neritid shells. p.576. In: Betancourt, P.P., Davaras, C., Dierckx, H.M.C., et al. (eds), *Excavations in the Hagios Charalambos Cave: a preliminary report. Hesperia*, 77 (4): 539-605.

ABSTRACT: Four bleached and unidentified species of marine neritid shells, holed for use as beads or ornaments, are described from the cave of Hagios Charalambos in Crete. These are the first neritid shells to be reported from the island, to which they are not native, and it is possible that they were imported from the Red Sea. They have a *terminus ante quem* of MM IIB [Middle Minoan IIB, c. 1800-1700 BC], the final date for the main deposit of pottery within the ossuary. (JRS)

Zilhão, J., Angelucci, D.E., Badal-García, E., d'Errico, F., Daniel, F., Dayet, L., Douka, K., Higham, T.F.G., Martínez-Sánchez, M.J., Montes-Bernárdez, R., Murcia-Mascarós, S., Pérez-Sirvent, C., Roldán-García, C., Vanhaeren, M., Villaverde, V., Wood, R. and Zapata, J., 2009. Symbolic use of marine shells and mineral pigments by Iberian Neandertals. *Proceedings of the National Academy of Sciences of the USA*, www.pnas.org/cgi/doi/10.1073/pnas.0914088107

ABSTRACT: Two sites of the Neanderthal-associated Middle Palaeolithic of Iberia, dated to as early as approximately 50,000 years ago, yielded perforated and pigment-stained marine shells. At Cueva de los Aviones, three umbo-perforated valves of *Acanthocardia* and *Glycymeris* were found alongside lumps of yellow and red colorants, and residues preserved inside a *Spondylus* shell consist of a red lepidocrocite base mixed with ground, dark red-to-

black fragments of haematite and pyrite. A perforated *Pecten* shell, painted on its external, white side with an orange mix of goethite and haematite, was abandoned after breakage at Cueva Anton, 60 km inland. Comparable early modern human-associated material from Africa and the Near East is widely accepted as evidence for body ornamentation, implying behavioural modernity. The Iberian finds show that European Neanderthals were no different from coeval Africans in this regard, countering genetic/cognitive explanations for the emergence of symbolism and strengthening demographic/social ones. (Authors' summary)

John Evans Dissertation Prize

To honour the memory of John 'Snails' Evans (1941-2005) and his achievements within environmental archaeology, the Association for Environmental Archaeology has launched an annual competition for the best undergraduate and post-graduate dissertation in this subject area. Departments of Archaeology (or other relevant departments) are invited to submit the dissertation of their best candidate by 31 July 2010. Submissions from individual students are not accepted. Prizes of £75 will be awarded for the winning dissertations, which may be on any aspect of environmental archaeology. For more information, please contact Dr Naomi Sykes at naomi.sykes@nottingham.ac.uk

The 2009 undergraduate prize had an archaeomalacological theme:

The snail's trail: can land snail shell aragonite provide an accurate record of intra-annual and inter-annual past climate shifts?

Amy Jeffrey, Division of Archaeological, Geographical and Environmental Sciences,
University of Bradford, UK

Land snail shells are potentially excellent climate and environmental indicators because they are often abundant in archaeological sites, have small home ranges, and preserve an incremental isotopic record. This project explored the relationship between the isotopic composition of *Helix aspersa* [= *Cornu aspersum*] shell carbonate, and climate and environment, by comparing records from three locations and using available climate data. Shells from two cool, temperate regions in England and one from a Mediterranean location in central Italy were incrementally sampled to produce high resolution oxygen and carbon isotope profiles recording each snail's development through the spring-summer-autumn period. Winter hibernation and other aestivation events, visible in each shell, were used as time markers. As in previous studies, a strong correlation was found between $\delta^{18}\text{O}$ of the shell and local meteoric water. Bulk $\delta^{18}\text{O}$ values for the Italian snails were indistinguishable from the Yorkshire shells, while their bulk $\delta^{13}\text{C}$ values were significantly higher than all the English shells, reflecting the more xeric Mediterranean vegetation. High resolution isotope profiles display considerable variability, suggesting that particular precipitation events, and emergence from short-term aestivation, are recorded. The patterning of the profiles in snails from England and Italy differs; the latter show a series of negative $\delta^{18}\text{O}$ excursions probably associated with reactivation after dry episodes, while the former show a consistent but unexplained reduction in $\delta^{13}\text{C}$ in the second summer. Snail biology and metabolism in response to short-term external shifts is undoubtedly a complicating factor in interpretation of high resolution isotopic profiles that requires further study. [From: *Association for Environmental Archaeology Newsletter*, No. 107 (February 2010): 14.]

Conferences

Archaeomalacology: shells in the archaeological record

This is the title of the full-day archaeomalacology session planned for the **ICAZ 2010** conference, which will take place in Paris, France, on 23-28 August 2010.

The study of invertebrate remains has traditionally been overshadowed by analysis of animal bones in the archaeological record. Yet evidence for human collection and modification of shells in particular has great temporal depth and is to be found in all corners of the world. This session seeks to highlight the potential use of molluscan remains to investigate issues of resource procurement and use, the social context of shell gathering and utilization, and the various ways in which archaeomalacology can assist in current issues of environmental change and management. Three sub-sessions will examine the use of shell as a raw material, the status and nature of shellfish as a food resource, and the potential of shell to probe questions of environmental and site transformations through time.

Further details can be found at <http://triton.anu.edu.au/Paris%202010%20Conference.htm> and <http://www.alexandriaarchive.org/icaz/>

What is this remain? Evidence of aquatic resources in Mesolithic times

A second session of potential interest to archaeomalacologists has been proposed for the **MESO 2010** conference, which will be held in Santander, Spain, on 13-17 September 2010.

This session has the aim of presenting firstly the diversity of faunal remains found in Mesolithic contexts (urchins, crabs, goose barnacles, shells, fish, birds, mammals) and the necessary sampling methods to obtain the best view of this diversity, and secondly a reflection on methodological developments in archaeozoology. The development of excavation methods adapted to archaeozoological remains means that the list of taxa recovered has been enlarged and transformed into quantitative tables. In addition, the application of fine sieving techniques enables the recovery of a sufficiently large number of faunal remains for an analysis of the biometrics and morphometrics of the exploited taxa. Participants are invited to discuss those 'enigmatic' finds or remains that they have difficulty in identifying. This increase in the quantity of information will be discussed together with methodological developments like isotope analysis, biometry, morphometry and taphonomy, including aspects such as protein contribution of aquatic resources to the diet, preparation and conservation. The aim is to understand fishing and gathering skills and the technological level of different Mesolithic groups, their way of life and the importance of navigation, etc. This session is seen as a discussion meeting for the exchange of information about sampling methods and the development of more powerful forms of archaeozoological analysis.

This session, organised by Catherine Dupont *et al.*, is in addition to the one on **Gastropods and humans in the Late Palaeolithic and Mesolithic of Europe and the circum-Mediterranean** (see AMG Newsletter, No.16: 16). For more information, see the conference website at <http://www.meso2010.com/programme.html>
