THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER

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With this issue of the Archaeo+Malacology Group Newsletter *we report that the ICAZ Archaeomalacology Working Group (AMWG) now has a new website (see article below). The AMWG will continue to host the newsletter, and this issue and all back issues can now be found at:* ***http://www.archaeomalacology.com****.*

As always, a big 'thank you' is due to everyone who has submitted articles for the newsletter and papers for abstracting – please keep these items coming in, and encourage your colleagues to contribute as well. The newsletter welcomes short articles, abstracts, reviews, and news items on all aspects of archaeomalacology: palaeoenvironmental reconstructions, dietary studies, elucidation of ancient trade routes, ornaments and jewellery, tools and containers, ritual and symbolism. Please share your interests and expertise with other archaeomalacologists. ***The copy deadline for the next issue is 15 June 2012****.*

Current and previous issues of the newsletter are available at http://archaeomalacology.com and http://home.earthlink.net/~aydinslibrary/AMGnews.htm, with grateful thanks to Kat Szabó of the ICAZ Archaeomalacology Working Group and to Aydın Örstan, respectively.

Contents

New ICAZ Archaeomalacology Working Group website

Since 2002, the ICAZ AMWG website has been hosted by the Australian National University at http://triton.anu.edu.au. In 2009, the web maintainer (Kat Szabó) shifted to the University of Wollongong and the time has come to relocate the site. This was also an ideal time to change aspects of the site given the growth in membership between 2002 and 2011.

The new AMWG website is kindly hosted by the University of Wollongong and can be found at http://www.archaeomalacology.com (apparently we did not have a lot of competition for this domain name ...). Do have a look! The site is regularly updated, so if you would like to join the AMWG and have your details integrated into the site, then please visit http://www.archaeomalacology.com/membership.html for instructions. For those who are

members already and would like to update details of institutional affiliation, email addresses in the group mailing list, current publications or forward on items of interest, please email Kat Szabó at kat.szabo1@gmail.com or complete a new version of the 'question sheet' which is now downloadable at http://www.archaeomalacology.com/membership.html.

We are one of the few ICAZ working groups with a current website and it is by far the largest and most comprehensive. The growth in membership and various queries that are regularly sent to Daniella Bar-Yosef Mayer and Kat Szabó attest to its visibility in the realm of e-research. Let's continue to make it a hub for matters archaeomalacological by working together to keep it current and interesting. If you have any suggestions for additional material or ideas for useful things to incorporate in the website, please don't hesitate to contact Kat at kat.szabo1@gmail.com. **(Kat Szabó)**

Papillifera papillaris and other snails imported with stones into south-west Germany

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Many stonemasons in Germany import stones from foreign countries. Imports from overseas are usually gassed with methyl bromide (Mack, 2003), and only exceptionally are living animals found. However, such measures are not usually applied to imports from within the European Union, and the transport of living snails in crevices of rocks is possible.

Papillifera papillaris (Müller, 1774) has been imported with stones from its original distribution range in Italy to many other parts of Mediterranean Europe and North Africa since the Roman period (Örstan, 2006; Gümüs and Mienis, 2010), and even to England within the last 250 years (Ridout-Sharpe, 2005, 2010). This species has not previously been reported from Germany. Recent imports of many snail species in south-west Germany are listed by Schmid (2002).

During an investigation of the snail fauna in stonemasons' yards in the surroundings of Stuttgart (Baden-Württemberg, south-west Germany), several exotic species were found (Rosenbauer, 2011). Altogether 35 stonemasons' depots were checked, and populations of exotic snails were found at 17 of them.

The most frequent species was *Charpentieria itala* (von Martens, 1824) at 13 localities. Two historical colonies of *Charpentieria itala* in Baden-Württemberg were already known: one at vineyards in Weinheim where the snails were imported with grapevines from Italy in about 1830, and another at Heidelberg castle where snails from Weinheim were deliberately released by collectors sometime before 1870 (Schmid, 2002). *Chilostoma cingulatum* (Studer, 1820) was found at nine localities. This species was previously known at two places in Baden-Württemberg: on the town wall of Ettlingen (Schmid, 2000) and on a rock near Geislingen (Kobialka, 2000). The origin of these populations is not known. In addition, two populations of *Xerotricha conspurcata* (Draparnaud, 1801) were discovered, and these provided the first proof of hibernating populations of this species in Germany. None of these three species is indigenous to Germany; their original distribution ranges are the Mediterranean and south Alpine regions. The snails appear to be able to survive in stonemasons' yards for several years, they are not sensitive to frost, and they obviously find good living conditions in the hot and dry seasons of the year.

Living *Papillifera papillaris* were recorded at only one location, at the depot of a stonemason in the town of Neckarrems. These snails were found on limestone rocks imported from Bari in southern Italy, which contain many holes filled with earth. Mediterranean plants (*Thymus* sp., *Asparagus* sp., *Euphorbia* sp.) were growing in some of the holes (Fig. 1). No living animals but shells of further Mediterranean species, such as *Cantareus apertus* (Born, 1778), *Cernuella virgata* (Da Costa, 1778), *Eobania vermiculata* (O.F. Müller, 1774), *Ferussacia folliculus* (Schröter, 1784), *Granopupa granum* (Draparnaud, 1801), *Jaminia quadridens* (O.F. Müller, 1774), *Mastus pupa* (Linnaeus, 1758), *Pomatias elegans* (O.F. Müller, 1774), *Rumina decollata* (Linnaeus, 1758) and *Truncatellina callicratis* (Scacchi, 1833), were also found in these holes. Possibly the shells had already accumulated in the holes in Italy, because most of them were quite weathered. A second discovery of *Papillifera papillaris* was made some miles away at the depot of a stonemason in Winnenden, although only empty shells were found there beneath Italian limestone blocks.

Fig. 1: Limestone rock in a stonemason's yard at Neckarrems

Fig. 2: *Papillifera papillaris* on a limestone rock at Neckarrems

One year after *Papillifera papillaris* was first recorded at Neckarrems the animals were still alive (Fig. 2) and even some young individuals were noticed. Winter 2010 in the region of Stuttgart was very long and cold, and it seems that this species is able to survive even in a Middle European climate with frosty winters.

The limestone rocks are sold as decorations and together with the stones the snails will be spread to private gardens in the surroundings of Stuttgart. It would be interesting to watch how populations develop in subsequent years and if they are able to find their way to new habitats. This is archaeomalacology in the making.

Acknowledgements

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Helix chassyana (Kobelt, 1895) in sandstone layers containing marine molluscs from the Pleistocene ME-5 stage of coastal sites on Cyprus

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Recent surveys of Pleistocene outcrops dating to stage ME-5 along the coast of Cyprus (Galili *et al*., 2011) have revealed the presence of land snails among the marine faunal remains. Samples from three localities among the 22 sites studied (site 1: Karpaz Bay; site 3: Kapsalos and site 17: Cape Greco, south-east side) contained a single terrestrial snail in addition to numerous marine molluscs. The Pleistocene ME-5 stage is the warm period between the two last glacial events in the Mediterranean region. This period is characterised by a Senegalese fauna of which *Persististrombus latus* (syn. *Strombus bubonius*) is a guide fossil in the Mediterranean area.

If these land snails were living during the same period as the marine shells then they should be approximately 100,000 years old. On the other hand, *Helix* snails are subterranean aestivators, and therefore we may not rule out the possibility that snails of more recent origin managed to enter the not-yet-consolidated layers containing ME-5 molluscs at a somewhat later date. In cases where the snails may not have survived the dormant period during the long hot summer, these *Helix* shells could in this way have formed a younger element within the fossilised ME-5 layers.

Whatever the real age of these snails, they all belong to a single species of the genus *Helix*, family Helicidae. A study of the representatives of that land snail genus still living on Cyprus revealed that they are without doubt identical to *Helix chassyana* Kobelt, 1891, a species restricted in its distribution to Cyprus.

A comparison of the width and height ranges of recent specimens of *Helix chassyana* present in the Mollusc Collection of the Hebrew University of Jerusalem (Table 1) with those of the fossil specimens now lodged in the Mollusc Collection of Tel Aviv University (Table 2) revealed that the recent and fossil specimens show the same range in variation.

Helix chassyana snails are rather small for the genus, of which at least two additional, much larger species are living on Cyprus: *Helix cincta* Müller, 1774 and *Helix xeraethia* Kobelt, 1895, not forgetting the closely related *Cornu aspersum megalostomum* (Bourguignat, 1864). So far we lack any information as to whether *Helix chassyana* has ever been exploited for food. However, it is noteworthy that on some of the Pleistocene ME-5 sites Pre-Pottery and Pottery Neolithic remains have been found.

Locality	Collector + date	No.	Mean width	Mean height
Mount Pentadaktylos	G. Haas, 12.08.1950	9	24.5 mm	25.9 mm
Kalopsida	G. Haas, 17.08.1950	1	24.4 mm	24.0 mm
Larnaka	G.A. Mavromoustakis, 1933	4	28.3 mm	29.5 mm
Larnaka, Salt Lake	R. Ortal, 23.06.1991	1	27.8 mm	29.8 mm
Paramali Forest	G. Haas, 20.08.1950	1	29.0 mm	29.7 mm
	Total/mean	16	25.9 mm	27.2 mm

Table 1: Measurements of recent specimens of *Helix chassyana* from Cyprus

Locality	Collector + date	No.	Mean width	Mean height
Site 1: Karpaz Bay	E. Galili, 04.2009	1	24.9 mm	28.8 mm
Site 3: Kapsalos	E. Galili, 04.2009	1	23.0 mm	26.4 mm
Site 17: Cape Greco, SE side	E. Galili, 2011	1	24.8 mm	26.3 mm
	Total/mean	3	24.2 mm	27.2 mm

Table 2: Measurements of fossil specimens of *Helix chassyana* from Cyprus

The marine molluscs found at the Pleistocene ME-5 sites studied on Cyprus will be dealt with in detail elsewhere.

Acknowledgements
I would like to thank Dr Ehud Galili (Zinman Institute of Archaeology, University of Haifa, Haifa) and Dr M. Sevketoglu (Cyprus International University, Nicosia) for giving me the opportunity to study the discussed material.

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A preliminary reconstruction of the mollusc fauna of the Lower Nahal Soreq Valley in Israel since the Late Pleistocene-Early Holocene

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Nahal Soreq (formerly Wadi Rubin) is an intermittent stream which has its origin in the Judean Hills in the neighbourhood of Jerusalem and reaches the Mediterranean Sea just north of Palmahim, Israel. It carries water the whole year round only in the last few kilometres where it reaches the dune area. The urbanisation of the Rishon Le Ziyyon-Nes Ziona-Rehovot area, especially since the establishment of the State of Israel, has drastically changed the fauna of the lower part of the Nahal Soreq Valley. In particular, the aquatic fauna has suffered from severe water pollution. In the following lines a preliminary reconstruction is given of the inland mollusc fauna of the Lower Nahal Soreq Valley, based on material collected from various localities within the valley.

Material

The following material was studied in order to reconstruct the aquatic, amphibious and terrestrial mollusc fauna of the wet habitats in the Lower Nahal Soreq Valley:

- Late Pleistocene and Holocene to Recent channel cleanings in the Sede Soreq area, collected by H.K. Mienis;
- archaeological material from an excavation near Palmahim carried out by E. Braun;
- archaeological material from the excavations carried out by M. Fischer in Yavne Yam (Mienis, 2010);
- archaeological material from the salvage excavation carried out in Yavne Yam North by M. Ajami and U. Ad;
- mollusc material collected between 1920 and 1960 by P.A. Buxton, K.S. Krikorian, G.E. Ayoub, Z. Saliternik and G. Witenberg, all parasitologists who were involved with the study of bilharzia (schistosomiasis) in Palestina c.q. Israel, and by the zoologists G. Haas and H. Bytinski-Salz. This material is present in the Mollusc Collections of the Hebrew University of Jerusalem (HUJ) and Tel Aviv University (TAU MO) (Mienis, 1977: dealing with the large mussels only);
- recent molluscs living in and near Ta'alat Soreq, a channel draining Sede Soreq, collected by H.K. Mienis and the late G. Gafni.

Results

The results of the study of the mollusc samples from the Lower Nahal Soreq area are enumerated in Table 1.

Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Valvata saulcyi	+	-	-	-	+	+	-
Bithynia phialensis	+	-	-	-	+	-	-
Heleobia phaeniciaca	-	-	-	-	+	+	-
Globuliana gaillardoti	+	-	-	-	-	-	-
Melanoides tuberculata	+	-	-	-	+	-	-
Melanopsis buccinoidea	+	-	+	-	+	+	-
Acroloxus lacustris	+	-	-	-	-	-	-
Galba truncatula	+	-	-	-	-	+	-
Stagnicola palustris	+	-	-	-	+	-	-
Radix natalensis	+	-	-	-	+	-	-
Ferrissia clessiniana	-	-	-	-	-	+	-
Bulinus truncatus	+	-	-	-	+	-	-
Planorbis planorbis antiochianus	+	-	-	-	-	-	-
Gyraulus ehrenbergi	+	-	-	-	-	-	-
Gyraulus piscinarum	+	-	-	-	-	+	-
Biomphalaria alexandrina	-	-	-	-	+	-	-
Haitia acuta	+	-	-	-	-	+	+
Carychium minimum	+	-	-	-	-	-	-
Carychium tridentatum	+	-	-	-	-	-	-
Oxyloma elegans	+	-	-	-	-	+	+
Vertigo antivertigo	+	-	-	-	-	-	-
Vallonia enniensis	+	-	-	-	-	-	-
Vallonia pulchella	+	-	-	-	-	-	-
Oxychilus spec.	+	-	-	-	-	-	-
Daudebardia saulcyi	+	-	-	-	-	-	-
Euconulus fulvus	+	-	-	-	-	-	-
Cecilioides acicula	+	-	-	-	-	+	+
Monacha syriaca	+	-	-	-	+	+	+
Xeropicta vestalis subspec.	+	-	-	-	+	-	-
Potomoda littoralis delesserti	-	+	-	-	+	-	-
Unio mancus eucirrus	-	+	+	+	+	-	-
Corbicula consobrina	-	-	-	-	+	-	-

Musculium lacustre	+	-	-	-	-	-	-
Pisidium annandalei	+	-	-	-	-	+	-
Pisidium casertanum	+	-	-	-	-	+	-
Pisidium milium	+	-	-	-	-	-	-
Pisidium personatum	+	-	-	-	-	-	-
Total (N=37)	31	2	2	1	14	12	4

Table 1: Molluscs collected in the Lower Nahal Soreq Valley

Key: 1= Ta'alat Soreq, Late Pleistocene and Holocene-Recent channel cleanings, leg. H.K. Mienis, spring 1988; **2**= archaeological excavation near Palmahim carried out by E. Braun; **3**= archaeological excavations of Yavne Yam conducted by M. Fischer; **4**= archaeological excavation of Yavne Yam North conducted by M. Ajami and U. Ad; **5**= samples collected between 1920 and 1960 present in the HUJ and TAU MO collections; **6**= Ta'alat Soreq, channel draining Sede Soreq, leg. H.K. Mienis and G. Gafni, January 1980; **7**= Ta'alat Soreq, channel draining Sede Soreq, leg. H.K. Mienis, spring 1988.

Discussion

The study of the available material revealed that at least 37 species of molluscs have occurred in the lower part of the Nahal Soreq area. Among them are eight species which are now considered extinct in Israel: *Acroloxus lacustris*, *Biomphalaria ehrenbergi*, *Carychium tridentatum*, *Vertigo antivertigo*, *Vallonia enniensis*, *Oxychilus* sp., *Euconulus fulvus* and *Pisidium milium.* Four of these species had not previously been reported from Israel: *Carychium tridentatum*, *Vallonia enniensis* (for this species, see Mienis, 1992), *Oxychilus* sp. and *Euconulus fulvus*. Only a single disintegrated shell of *Oxychilus* was available for study and the fragments could not be assigned to any species known to occur in Israel.

Of the 37 species recorded here, 12 were still found by Mienis and Gafni on 1 January 1980; this number was reduced to only four in the spring of 1988. In Nahal Soreq not a single living species was encountered, while the reduction in the number of species in Ta'alat Soreq between 1980 and 1988 could be related to over-pumping of the aquifer and by the extended canalisation of the drainage channel. While in 1980 the channel carried at least a trickle of running water the whole year round, in 1988 only some pools were left. This resulted in the complete disappearance of all the prosobranch gastropods among the aquatic molluscs. Noteworthy is the fact that the channel cleanings of Ta'alat Soreq, which contained not less than 31 species, included a strange mixture most probably not only of Late Pleistocene or Early Holocene species, but also some of fairly recent origin, because among them the invasive *Haitia acuta* from North America was encountered. Another newcomer, *Ferrissia clessiniana*, a Nilotic species, was found to be present on the submerged parts of the stems of *Typha* species in 1980.

From an ecological point of view the encountered species may be assigned to several different types of habitats: permanent running water (streams), standing water (permanent and temporary pools), marshes and moist banks (Table 2).

Species	**Permanent water flow**	**Standing water**	**Permanent marshes**	**Moist banks**
Valvata saulcyi	+	-	+	-
Bithynia phialensis	+	-	+	-
Heleobia phaeniciaca	+	-	-	-
Globuliana gaillardoti	+	-	-	-
Melanoides tuberculata	+	-	(+)	-
Melanopsis buccinoidea	+	-	-	-
Acroloxus lacustris	(+)	+	+	-
Galba truncatula	-	+	+	+
Stagnicola palustris	-	(+)	+	-
Radix natalensis	(+)	(+)	+	-

Ferrissia clessiniana	(+)	+	+	-
Bulinus truncatus	-	+	+	-
Planorbis planorbis antiochianus	-	(+)	+	-
Gyraulus ehrenbergi	-	(+)	+	-
Gyraulus piscinarum	-	(+)	+	-
Biomphalaria alexandrina	-	(+)	+	-
Haitia acuta	+	+	+	-
Carychium minimum	-	-	(+)	+
Carychium tridentatum	-	-	-	+
Oxyloma elegans	(+)	+	+	+
Vertigo antivertigo	-	-	(+)	+
Vallonia enniensis	-	-	-	+
Vallonia pulchella	-	-	-	+
Oxychilus sp.	-	-	-	+
Daudebardia saulcyi	-	-	-	+
Euconulus fulvus	-	-	(+)	+
Cecilioides acicula	-	-	-	+
Monacha syriaca	-	-	-	+
Xeropicta vestalis ssp.	-	-	-	+
Potomoda littoralis delesserti	+	-	-	-
Unio mancus eucirrus	+	-	-	-
Corbicula consobrina	+	-	-	-
Musculium lacustre	-	-	+	-
Pisidium annandalei	+	-	+	-
Pisidium casertanum	+	-	+	-
Pisidium milium	+	-	+	-
Pisidium personatum	+	-	+	-
Total (N=37)	18	12	23	13

Table 2: Habitats occupied by the molluscs which occur or have occurred in the Lower Nahal Soreq Valley. **Key: +** = present, **(+)** = might be present, **-** = absent.

Concluding remarks

By means of the study of palaeontological, archaeomalacological, parasitological and zoological-malacological collections, it was possible to reconstruct (more or less) the mollusc fauna of the former wetlands of the Lower Nahal Soreq Valley. At least 37 species inhabited this area. Among them were species characteristic of permanent streams and other species which occur only in marshes or slow flowing streams with rich aquatic vegetation. The information obtained in this way might be important for any efforts in the future to restore the fauna and flora of this spoilt river basin.

Acknowledgements

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Abstracts

Bar-Yosef Mayer, D.E., Leng, M.J., Aldridge, D.C., Arrowsmith, C., Gümüs, B.A. and Sloane, H.J., 2011. Modern and early-middle Holocene shells of the freshwater mollusc *Unio*, from Çatalhöyük in the Konya Basin, Turkey: preliminary palaeoclimatic implications from molluscan isotope data. *Journal of Archaeological Science*, 39 (2012): 76-83 (doi: 10.1016/j.jas.2011.09.003).

ABSTRACT: Excavations at Çatalhöyük since 1993 have yielded thousands of mollusc shells, including many valves of *Unio* cf. *pictorum*. The site was occupied from the Early Pottery Neolithic of Early Central Anatolia (ECA II) through the early to middle Chalcolithic (ECA IV-V). Because *Unio* shells occurred throughout the site sequence and because individual shells can live for several years and show well-defined annual growth rings, an attempt was made to determine seasonal climatic fluctuations during the Neolithic and Chalcolithic periods by $\delta^{13}C$ and $\delta^{18}O$ isotope analysis. Four specimens were selected from representative levels dated between 7200 and 5000 cal BC. Samples were taken at c.0.5 mm intervals on the exterior surface of the shells from the umbo to the ventral margin using a 1 mm-diameter drill, and 100 μg samples were analysed using a GV IsoPrime spectrometer and multiprep system. A modern shell of *Unio mancus eucirrus* from a lake shore near Adana, southern Anatolia, was analysed for comparison. The range in $\delta^{13}C$ values from the subfossil shells was similar to that from the modern shell, indicating no significant differences between diet and C contributions. The $\delta^{18}O$ values of the subfossil shells showed distinct seasonality. Winter values suggested high recharge of lake water by rainfall and/or river flooding, while summer values were indicative of extensive evaporation and hence aridification in the summer months, similar to conditions in the area today. (JRS)

Cortés-Sánchez, M., Morales-Muñiz, A., Simón-Vallejo, M.D., Lozano-Francisco, M.C., Vera-Peláez, J.L., Finlayson, C., Rodríguez-Vidal, J., Delgado-Huertas, A., Jiménez-Espejo, F.J., Martínez-Ruiz, F., Martínez-Aguirre, M.A., Pascual-Granged, A.J., Bergadà-Zapata, M.M., Gibaja-Bao, J.F., Riquelme-Cantal, J.A., López-Sáez, J.A., Rodrigo-Gámiz, M., Sakai, S., Sugisaki, S., Finlayson, G., Fa, D.A. and Bicho, N.F., 2011. Earliest known use of marine resources by Neanderthals. *PLoS ONE*, 6 (9): e24026 (doi: 10.1371/journal.pone.0024026).

ABSTRACT: Numerous studies along the northern Mediterranean coast have documented the use of shellfish by Neanderthals but none of these finds is prior to Marine Isotope Stage 3 (MIS 3). In this paper evidence is presented to show that gathering and consumption of molluscs can now be traced back to the lowest level of the archaeological sequence at Bajondillo Cave (Málaga, Spain), dated to the MIS 6. The taxonomic and taphonomic features of the molluscan assemblages from this level (Bj_{19}) are described, and those retrieved in levels Bj_{18} (MIS 5) and Bj_{17} (MIS 4) are also briefly described, evidencing a continuity of shellfishing activity that reaches to MIS 3. The main species exploited was *Mytilus galloprovincialis*, which represented 96.02% (1305 of 1359), 89.85% (496 of 552) and 87.85% (94 of 107) of the total molluscan assemblage in Bj_{19}, Bj_{18} and Bj_{17}, respectively. Other marine species were poorly represented (1-4 individuals only) and included *Acanthocardia tuberculata, Callista chione, Stramonita haemastoma, Donacilla cornea, Glycymeris* sp., ?*Thracia* sp., *Panopea glycimeris*, and barnacles (*Balanus* spp.). A few land and freshwater species were also present: *Iberus marmoratus, Rumina decollata, Theba pisana, Xerotricha* sp., *Vitrea* sp., *Otala lactea, Cecilioides acicula*, Helicidae sp., *Melanopsis laevigata, Bithynia tentaculata, Succinea putris* and *Pisidium casertanum*. The evidence is substantiated by radiocarbon, thermoluminescence and U-series dating and palaeoenvironmental records, which are fully consistent with the palaeoclimatic conditions expected for the different stages. It is concluded that the use of shellfish resources by *Homo neanderthalensis* in southern Spain started around 150,000 years ago and is almost

contemporaneous with Pinnacle Point (South Africa), where shellfishing is first documented by archaic modern humans. (Expanded and adapted from authors' summary)

Faulkner, P., 2011. Late Holocene mollusc exploitation and changing near-shore environments: a case study from the coastal margin of Blue Mud Bay, northern Australia. *Environmental Archaeology*, 16 (2): 137-150.
ABSTRACT: Coastal shell middens on Point Blane Peninsula, Blue Mud Bay, north-east Arnhem Land, Australia, were examined to explore environmental change and patterns of molluscan exploitation during the late Holocene. Molluscan species richness, diversity and habitat exploitation through time and space have echoed environmental change. Six shell midden/mound deposits were examined, three facing east (Myaoola Bay) and three facing west (Grindall Bay), with excavation units varying in date from c.3000 cal BP to the present day. Thirty-five molluscan taxa were identified as economic species. Several species appear consistently at the Myaoola Bay sites, such as *Marcia hiantina, Septifer bilocularis* and *Gafrarium* sp., with differences in species ranking relating to the variable distribution and dominance of specific habitats through time. In contrast, the Grindall Bay mounds showed much less variability: *Anadara granosa* was dominant at all three sites, followed by *Mactra abbreviata* and *Marcia hiantina*, all of which inhabit sand and mud flats. These patterns show a more evenly spread use of molluscan resources in Myaoola Bay, with no single species being exploited at a level greater than 50%, whereas the Grindall Bay mounds were dominated by *Anadara granosa* (68-88%). Across the Peninsula, at c.3000 cal BP there was a greater focus on shallow water inshore species, between c.2500 and 500 cal BP there was greater exploitation of sand- and mud-dwelling species, and after c.500 cal BP there was an increase in abundance of mangrove species such as *Isognomon isognomon*. (JRS)

Gerber, J. and Schechter, E.M., 2011. Analysis and interpretation of invertebrate remains. In: Terrell, J.E. and Schechter, E.M. (eds), Exploring prehistory on the Sepik Coast of Papua New Guinea. *Fieldiana: Anthropology*, N.S., 42: 219–239.
ABSTRACT: Invertebrate remains recovered during excavations on the Sepik coast of Papua New Guinea in 1996 were analysed. The main excavations took place in the Aitape hills, about 2 km inland from the current coastline, and on Tumleo Island, some 3 km off the coast. The two sites in the Aitape hills were single-component sites occupied c.1300-1200 years ago; the Tumleo Island site covered a time span of c.1500-2000 years. Remains of 72 mollusc, one arthropod, and two echinoderm species were identified. Forty-six of these are marine, 19 are from freshwater or brackish water and mangrove habitats, and 11 are terrestrial. A complete list and figures of most species are given. Analysis of the recovered remains suggests that in the Aitape hills, mollusc species gathered in freshwater and brackish water and mangrove habitats were exploited extensively (n=2015), while marine species played an insignificant role as a food source (n=240); terrestrial species were also represented (n=356). Conversely, on Tumleo Island (where samples of the invertebrate remains were available for qualitative analysis only), most freshwater species found on the mainland are absent and only a limited number of species inhabiting the interface of salt water and freshwater, such as mangrove swamps and estuaries, are present in considerable quantities. In addition, marine species were likely to have played a larger role as a food resource. Artefacts made from invertebrate remains are described and pictured. Ornaments included a specimen of *Erosaria annulus* with the dorsum removed; putative beads and pendants made of perforated *Cheilea* sp., *Clypeomorus bifasciata* and *Ovula ovum*; shell discs of *Placuna ephippium* and *Tridacna* sp.; and half a shell ring of *Tridacna* sp. One *Conus* sp. had been modified to form a ?gouge, and the umbo of an *Andara granosa* valve had been perforated and is interpreted as a net sinker. (Expanded authors' summary)

Henshilwood, C.S., d'Errico, F., van Niekerk, K.L., Coquinot, Y., Jacobs, Z., Lauritzen, S.-E., Menu, M. and García-Moreno, R., 2011. A 100,000-year-old ochre-processing workshop at Blombos Cave, South Africa. *Science*, 334 (6053): 219-222.
ABSTRACT: Excavations in 2008 at Blombos Cave, near Cape Town, South Africa, uncovered an apparent workshop containing the toolkit used by early modern humans about 100,000 years ago to manufacture ochre pigment. The process appears to have entailed grinding pieces of red ochre on quartzite slabs to obtain a fine powder. Chips of ochre were also crushed with hammer stones and combined with crushed heated animal bone, charcoal and stone chips, and mixed together with liquid in two abalone (*Haliotis midae*) shells. The mixture was probably gently stirred with a finger, as evidenced by tiny swirled impressions on the shell nacre where the finger came into contact with quartz grains. It is suggested that the natural holes in the abalone shells may have been plugged with organic material to make them more effective containers. These shells provide the earliest evidence for the use of containers anywhere in the world and predate the previous record (ostrich egg shell containers, also from South Africa) by some 40,000 years. This discovery is thought to mark a significant point in the evolution of human cognitive processes since it demonstrates the ability to source, combine and store substances in containers that were then probably used to enhance social behavior. (JRS)

Lubell, D. and Barton, N., 2011. Gastropods and humans in the late Palaeolithic and Mesolithic of the western Mediterranean basin. *Quaternary International*, 244 (1): 1-4 (doi: 10.1016/j.quaint.2011.06.042).
ABSTRACT: This guest editorial provides a summary of the papers in this special issue of *Quaternary International*, which are the expanded and revised versions of presentations given at the workshop entitled 'Gastropods and humans in the late Palaeolithic and Mesolithic of the western Mediterranean', held at the MESO 2010 conference in Santander, Spain, in September 2010. The focus of this issue is primarily on the significance of gastropods as sources of information on human behaviour and climate. The papers are grouped into four regions: North Africa (Morocco and Libya), Spain, Italy and the Adriatic coast of Croatia. The North African sites testify to the use of land snails as food, in one case possibly to supplement the over-harvesting of marine species. Greater molluscan diversity is seen on the northern side of the Mediterranean. Spanish sites include marine shell ornaments as well as edible species, and evidence is presented for the seasonal exploitation of land snails at inland sites. The shell size and age distributions of marine gastropods are discussed in relation to human predation pressure and environmental change, and climatic changes are investigated through stable isotope analyses of land snail shells. Isotopic evidence has also been used to investigate seasonal subsistence and mobility strategies of hunter-gatherers during the late Pleistocene-early Holocene transition. Problems associated with distinguishing natural accumulations of shells from man-made middens are discussed. A study of marine and freshwater shell ornaments found in Holocene sites on the coast of Croatia revealed large numbers of perforated shells of *Columbella rustica*, which were demonstrably larger during the Mesolithic than they are today: these shell beads have been found far inland, suggesting that extensive inter-regional exchange systems existed during the Mesolithic. (JRS)

Taylor, V.K., Barton, R.N.E., Bell, M., Bouzouggar, A., Collcutt, S., Black, S. and Hogue, J.T., 2011. The Epipalaeolithic (Iberomaurusian) at Grotte des Pigeons (Taforalt), Morocco. A preliminary study of the land Mollusca. *Quaternary International*, 244 (1): 5-14.
ABSTRACT: Land snail middens occur widely throughout the circum-Mediterranean, particularly in the Maghreb and Libya, yet are relatively understudied when compared with the better known coastal marine middens. The site of Taforalt (Grotte des Pigeons) in north-east Morocco contains thick ashy deposits with considerable numbers of land snails, dating to between 13,000 and 11,000 BP. The site has been excavated periodically since its discovery

in 1908, yet little attention has been paid to the land snail component. Recent excavations at the site as part of the Cemeteries and Sedentism Project has facilitated reinvestigation of the Iberomaurusian layers, including the upper ashy midden unit. This investigation addresses questions surrounding chronological variation in the lithic assemblage, subsistence strategies, population health and mortuary practices. Preliminary work on the land snails has identified a low species diversity in the grey series midden layers, characterised by the large edible species *Alabastrina alabastrites, Helix* cf. *aspersa, Dupotetia dupotetiana, Otala punctata* and *Cernuella* sp., which appear to represent an abrupt intensification in the use of land snails as a food source. Significant quantities of associated plant material and animal bone suggest that land snails were part of a broader based diet which was adopted from around 13,000 BP. (Authors' summary)

The contents of this special issue of Quaternary International *are listed in the previous issue of the* Archaeo+Malacology Group Newsletter*, No. 19 (Summer, 2011): 16-17.*

Shell midden research

Shell midden research: an interdisciplinary agenda for the Quaternary and social sciences (edited by Andrea Balbo, Ivan Briz Godino, Myrian Álvarez and Marco Madella)*, Quaternary International*, 239 (1/2): 1-170. 2011.

This special issue of *Quaternary International* brings together 15 papers on shell midden research world-wide. The Editorial, **Shell middens as archives of past environments, human dispersal and specialized resource management** (Myrian Álvarez, Ivan Briz Godino, Andrea Balbo and Marco Madella, pp. 1-7) presents a general review of the state of the art in shell midden research, with reference to three main topics: the study of aquatic resource exploitation, the antiquity of shell middens in relation to human dispersal and group diversification, and methodological improvement as enhanced by shell midden research.

Beginning with Asia and the Pacific region, **Molluscs in a world of islands: the use of shellfish as a food resource in the tropical island Asia-Pacific region** (Katherine Szabó and Judith Amesbury, pp. 8-18) focuses on the evidence for shellfish collection by non-*sapiens* hominins, the character of early *Homo sapiens* shellfish-gathering relative to coastal adaptations, the effect of sea level rises in the Holocene, and the role of shellfish in early subsistence patterns in Oceanic Micronesia and Melanesia-West Polynesia. Japanese shell midden research is reviewed in **Shell midden archaeology in Japan: aquatic food acquisition and long-term change in the Jomon culture** (Junko Habu, Akira Matsui *et al*., pp. 19-27). The authors look at recent advances in theory and method in Japan and discuss Jomon (c.14,000-500 BC) shell middens in four different regions with reference to regional and temporal variability. Shell midden formation processes are considered in **Inland shell midden site-formation: investigation into a late Pleistocene to early Holocene midden from Tràng An, northern Vietnam** (Ryan Rabett, Joanna Appleby *et al*., pp. 153-169), which presents a detailed examination of a land snail-dominated late- to post-glacial midden at an inland cave site. This particular site is described as a 'shell-bearing midden camp', indicating the presence also of non-shell material in the midden and the assumed seasonality of this site; the role it may have played in the early settlement of the area is discussed.

A controversial topic is raised in **From Asia to the Americas by boat? Paleogeography, paleoecology, and stemmed points of the northwest Pacific** (Jon Erlandson and Todd Braje, pp. 28-37). Rising sea levels and coastal landscape changes have resulted in a dearth of Pleistocene shell middens around the North Pacific Rim: this paper attempts to circumvent

these problems by reviewing the palaeogeography and archaeology of the late Pleistocene coastline and concludes that palaeoecology and lithic evidence connects Japan and Kamchatka to western North America and much of South America, supporting the idea that coastal migration contributed to the peopling of the Americas by c.16,000 cal BP. Later hunter-gatherers left large shell middens on the Channel Islands of California, and the analysis of faunal and human remains and stable isotope analyses of a massive midden site dating from AD 1000-1820 are described in **Weathering the storm: coastal subsistence and ecological resilience on late Holocene Santa Rosa Island, California** (Torben Rick, pp. 135-146). The data demonstrate significant continuity in coastal resources over time and the long-term adaptability of expanding populations to increased pressure on local resources and ecosystems. On the other side of the North American continent, **Coastal shell middens in Florida: a view from the Archaic period** (Rebecca Saunders and Michael Russo, pp. 38-50) reviews data on the earliest shell middens in coastal Florida and traces their development through the Archaic period (10,000-3000 BP). It is concluded that estuarine exploitation was well-established by 7200 BP, at least 2000 years earlier than previously thought.

Sambaquis **(shell mounds) of the Brazilian coast** (Gustavo Wagner, Klaus Hilbert *et al*., pp. 51-60) have been documented since the 16th century and are reviewed in this paper. They are found along the south-east coast from Espirito Santo to Rio Grande do Sul States and the oldest date back to the 6th century BC. They are found in a great variety of situations: caves, beaches, rock outcrops, mangrove swamps, lagoons and estuaries. This variability is also found in the material culture and resource exploitation, demonstrating a range of adaptive strategies and cultural diversity. **Littoral adaptation at the southern end of South America** (Luis Orquera, Dominque Legoupil and Ernesto Piana, pp. 61-69) reviews shell midden sites in southern Patagonia and the Fuegian Archipelago, where intense human exploitation of littoral and maritime resources developed from c.6400 BP to the 19th century AD. Despite the challenging climate, the technology and social organisation of the people remained at a very simple level, resulting in a homogeneous, durable and stable system. Ongoing ethnoarchaeological research in this area is described in a paper entitled **Towards high-resolution shell midden archaeology: experimental and ethnoarchaeology in Tierra del Fuego (Argentina)** (Ivan Briz Godino, Myrian Álvarez *et al*., pp. 125-134). Ethnographic information was combined with an experimental approach to reconstruct former site formation processes and resource use and management by the historic Yamana people.

Turning towards Europe, **Shell midden research in Atlantic Europe: state of the art, research problems and perspectives for the future** (Igor Gutiérrez-Zugasti, Søren Andersen *et al*., pp. 70-85) presents an overview by summarising available information about the formation of shell middens and coastal exploitation in several regions of Atlantic Europe (Denmark, Britain and Ireland, France, Spain and Portugal), and **Marine mollusc exploitation in Mediterranean prehistory: an overview** (A.C. Colonese, M.A. Mannino *et al*., pp. 86-103) does the same for the Mediterranean region. Here, marine molluscs have been found on sites dating back to the Lower Palaeolithic from at least c.300,000 years ago (Terra Amata, southern France) and shellfish continued to be exploited in large quantities by hunter-gatherer societies through to the Mesolithic. Close links between African and European populations are explored in **Marine resources exploitation by Palaeolithic hunter-fisher-gatherers and Neolithic tribal societies in the historical region of the Strait of Gibraltar** (José Ramos, Salvador Domínguez-Bell *et al*., pp. 104-113) on the basis of archaeological similarities between shell midden sites on both sides of the Strait. Beginning in the Middle Pleistocene (African side) and Mousterian (Cádiz coast), continuity is found throughout the Upper Palaeolithic on both sides and continues to appear among agricultural groups in the Holocene, when the exploitation of marine resources remained an important activity. The results suggest that there were contacts between Palaeolithic societies on both sides of the

Strait and, for Neolithic societies, the Strait of Gibraltar acted as a bridge rather than a boundary between Africa and Europe.

Amino acid racemization dating of marine shells: a mound of possibilities (Beatrice Demarchi, Matt Williams *et al*., pp. 114-124) explores the potential application of AAR dating to shell middens. A simple protocol is described to test the suitability of different mollusc species, which must possess an intra-crystalline fraction of amino acids which behaves as a closed system during diagenesis: of the taxa tested, *Patella, Strombus* and *Chicoreus* were suitable; *Tibia, Trochus* and *Anadara* were not. AAR dating was successfully applied to midden deposits from northern Scotland and the southern Red Sea, showing that this technique can be used in temperate and tropical zones in different parts of the world. Shell middens are considered as field laboratories with the potential to redefine key moments in human history in **Shell midden research: an interdisciplinary agenda for the Quaternary and Social Sciences** (Andrea Balbo, Marco Madella *et al*., pp. 147-152), which calls for the establishment of common guidelines that will allow the focus to shift from regional to continental scales and back again. **(Janet Ridout-Sharpe)**

Book Review: *Archaeomalacology revisited*

***Archaeomalacology revisited: non-dietary use of molluscs in archaeological settings* (edited by Canan Çakırlar). Oxford, Oxbow Books. viii + 95 pp. 2011.**

This book consists of ten papers, nine of which were presented at archaeomalacology sessions and one as an independent poster presentation at the 10th ICAZ Conference in Mexico City in 2006. Perhaps because of the venue, there is a strong and welcome emphasis on archaeomalacological studies in the New World. Three of the papers are based in Europe, one in North America, one in South America, and five in Mexico.

Esteban Álvarez-Fernández **(Personal ornaments made from mollusc shells in Europe during the Upper Palaeolithic and Mesolithic: news and views)** presents a synthesis of perforated marine molluscan artefacts across Upper Palaeolithic and Mesolithic Europe, and considers regional and temporal patterns of raw material exchange using long-distance communication routes along river valleys. He describes the typology and taphonomy of shell beads and pendants associated with settlements and burials dating from c.40,000-4700 cal BC; the earliest examples were found at Aurignacian sites, in some cases at a distance of more than 300 km from the sea. Most of the shells appear to have been beach-collected and the intentional selection of certain species is apparent. By the Mesolithic, *Columbella rustica* was the bead of choice and examples have been found several hundreds of kilometres from the nearest coastline. Unfortunately, this wide-ranging review is admittedly hampered by the lack of data from earlier excavations.

In contrast, Kirsty Murphy **('She drills seashells on the seashore': an experimental study – manufacture-wear vs. use-wear using Palaeolithic technologies for the perforation of whole shell beads)** focuses on a single shell bead assemblage from the Upper Palaeolithic site of Paviland Cave in South Wales, UK. Using a range of simple technologies that would have been available at the time, such as gouging, drilling, hammering, sawing and grinding, she has analysed her results in terms of perforation aesthetics, manufacture-wear patterns, best-suited tool types, and the shell type (thick or thin, rough or smooth) best suited for each technique. Finished beads were assembled into necklaces and bracelets for use-wear analysis and compared with the examples (*Littorina littorea*) from Paviland. It is concluded that sawing, in order to provide tool purchase, followed by drilling, produced the most effective results.

Moving on to the European Bronze Age, Alfredo Carannante **(Purple-dye industry shell waste recycling in the Bronze Age Aegean? Stoves and murex shells at Minoan Monastiraki (Crete, Greece))** considers possible secondary uses of dye production refuse at a Minoan palace site in central Crete. At this site, c.25 km from the coast and c.350 m above sea level, a concentration of highly fragmented *Hexaplex trunculus* shells (MNI=267) was found in association with a clay oven used for pottery production. Comparing the evidence from contemporary and later sites in the Aegean, the author concludes that these shells represented the waste from a purple dye manufacturing installation on the coast, possibly Kommos, which had been transported inland to be burned and used as ceramic temper. This recycling hypothesis could help to explain the presence of murex shell assemblages at other inland Bronze Age sites in the eastern Mediterranean.

On the other side of the Atlantic, Cheryl Claassen **(Shell symbolism in pre-Columbian North America)** uses an ethnoarchaeological approach to argue that the presence of marine shells among indigenous North American and Mesoamerican societies is linked to a perceived role of shell as a 'rejuvenator' through fertility and water symbolism. This symbolism is ultimately linked to the sea, which is recognised by many groups as a primordial world which has given birth to numerous deities and perhaps man himself. Several Mesoamerican deities are depicted in association with seashells, and the front cover of the book illustrates a beautiful (modern) Haida carving depicting the moment when the creator Raven opened the cockleshell and released the first men into the world.

A more pragmatic approach is offered by Diana Rocío Carvajal Contreras **(Shell artefacts from the Gold Museum in Colombia: a view from the Intermediate Area)**. The Gold Museum in Bogotá contains 1134 shell artefacts, but unfortunately many of these are without provenance: 183 artefacts were selected for this study and assigned to cultural areas within Colombia dated to between AD 500 and 1500, according to their stylistic features. Three artefact groups are described and illustrated: geometric beads and buttons; and zoomorphic and pseudozoomorphic beads and pendants. The iconographic aspects of these shell objects are comparable to other artefacts, especially metal objects, from this period within the so-called 'Intermediate Area' comprising the region between south-western Nicaragua and northern Ecuador, and indicate contact among the populations who lived in this area. The common stylistic components of the shell artefacts suggest that people living in the Intermediate Area may have shared a similar set of beliefs, knowledge and technology. However, the opposing scenarios of inter-regional exchange and a common cultural heritage can only be resolved by careful dating of shell artefacts from controlled excavations.

In Mexico, Adrián Velázquez Castro and colleagues **(The *Oliva* shell necklace from Tlacojalpan, Veracruz, Mexico)** describe a 60-bead shell necklace which was among the funerary offerings of a woman who was buried in a large urn dated to the Late Formative (600 BC-AD 400). The shells had been ground down on the dorsal and ventral sides to produce thin (5.1-5.8 mm) longitudinal sections. The lateral surfaces were also abraded to obscure the sutures of the spire. Two species of Olive shells were represented: *Oliva spicata* from the Panamanian malacological province and *Oliva reticularis* from the Caribbean province. Manufacturing scars were examined by scanning electron microscopy (SEM) and one of the beads was then replicated by grinding a shell against a rhyolite slab and polishing it with a chert nodule. It is estimated that the time taken to manufacture all the beads in this necklace was around 183 hours, emphasising its value and the high status of the woman with whom it was buried; it is so far unique. Clara Paz Bautista **(Adorning the dead: shell embroidery from the Temple of Quetzalcoatl, Teotihuacan, Mexico)** describes ornaments manufactured from marine shells that were found on the bodies of individuals sacrificed during the construction of the temple in AD 150-200. There were 18 collar-like units, each

comprising between 136 and 345 small shell objects arranged in a series of horseshoe-shaped configurations and worn as part of the dress. Some of these objects were carved to resemble human canine teeth and molars, and where these were missing real human maxillae were used instead. The 'teeth' were cut from *Turbinella angulata*, and other rectangular elements were made from *Spondylus princeps*. Manufacturing traces were examined by SEM and compared with marks left on experimentally produced objects. The results suggest that the shell was abraded using basalt and/or andesite rocks, cut with obsidian blades and perforated with small flint flakes.

SEM was also used by Emiliano Ricardo Melgar Tísoc **(Technological change in shell object manufacture on the western coastline of Chetumal Bay (Mexico))** to describe two Mayan traditions of shell artefact manufacture in south-east Yucatán. The first tradition spanned the Early Classic to Post-Classic (c.AD 150-1535) and was characterised by the use of exotic (Caribbean) shells and a manufacturing technique involving abrasion with basalt (also exotic to the area) and polishing with chert. The second tradition emerged during the Post-Classic and was probably introduced by new people at a time of demographic change: this was characterised by the use of local species including freshwater *Unio* sp., limestone abrasion and lack of polishing. A single Classic period (AD 630-802) Mayan shell pendant is described by Alicia Reyes Espinosa **(Producing jewellery for the upper class in pre-Hispanic Mesoamerica: a shell pendant from Yaxchilán, Chiapas, Mexico)**. This is roughly rectangular, approximately 50 mm wide and 40 mm high, and it was cut from the internal lip of a *Strombus gigas* shell. It depicts the left profile of an elaborately attired female. Once again SEM analysis and experimental techniques were used to suggest that it was made with a combination of obsidian and flint tools and acid (fermented fruit?) corrosion.

A well-known museum object has been reassessed by Mtra. María de Lourdes Gallardo Parrodi **(The necklace that wasn't a necklace: the shell circles of Chamber II at the Great Temple of Tenochtitlán (Mexico City, Mexico))**. This comprises numerous perforated nacreous beads made from *Pinctada mazatlanica* shells, carved into various shapes including rectangles, beetles, fish, frogs and the heads and rattles of rattlesnakes, together with some gold and greenstone beads. These beads were originally displayed as a four-strand necklace, but when this was dismantled for conservation the original location of the components was investigated. They had all been found within an earthen mound that supported a statue of Tláloc, the Aztec water god, in an offertory cache hidden within the 15th century AD temple, together with many other objects including stone masks, seashells, bones, figurines and ceramics. An analysis of iconographic sources resulted in the reinterpretation of these 'beads' as aquatic elements representing water currents inside a mountain, and they have been remounted as five concentric rings conforming to Aztec concepts of symmetry.

This book is to be welcomed for introducing Old World readers to New World archaeomalacology: until recently there has been little opportunity to view archaeomalacology from a global perspective. The text would have benefited from more stringent editing and some of the English is best described as 'quaint'. Nevertheless, this is an attractive and well-illustrated volume, with the added advantage that it is small and light enough to read in bed! **(Janet Ridout-Sharpe)**

Request for information: Victoria Taylor (V.K.Taylor@pgr.reading.ac.uk) would like to hear from anyone who has any experience of modern practices of collection, preparation and consumption of land snails, or knows of any papers regarding this subject. This is in relation to her research on land snail middens in Morocco (see Taylor, V.K. *et al*., 2011 under **Abstracts**, p. 11).

Thousands of Dove shells, *Columbella rustica*, on Tell Tadwira, a coastal hill complex north of Caesarea, Israel

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A visit to the Mediterranean beach adjacent to the most southern part of the aqueduct of Caesarea, Israel, included a brief stroll along the coast north of this ancient town. At about 1.2 km from the parking lot, the most western aqueduct becomes separated from the shore line by some low hills consisting of kurkar outcrops, a local sandstone, partly covered by very fine sand. These hills or dunes vary in height up to 7 m. Some remnants of man-made walls were seen on the beach side of these hills. Because of these walls, the sand hills were briefly examined on the way back. Here and there numerous sherds were present, and at one point a c.1 x 1 m piece of a mosaic floor was seen protruding from the sand.

However, what struck me in particular was the fact that thousands of Rustic Dove-shells, *Columbella rustica* (Linnaeus, 1758), Fam. Columbellidae, were lying on the surface (Fig. 1). They were more or less the only shells found on the hills. A few valves of the extremely common bivalve *Glycymeris insubrica* (Brocchi, 1814), Fam. Glycymerididae, and very few land snails, namely *Xerocrassa davidiana davidiana* (Bourguignat, 1863) and *Xeropicta vestalis joppensis* (Schmidt, 1855), both Fam. Hygromiidae, and *Theba pisana* (Müller, 1774), Fam. Helicidae, were also found.

Fig.1: *Columbella rustica* on the crest of Tell Tadwira

Obviously at some time the Dove-shells had been brought to the site by man. Since then they have been sand-blasted over and over again and have subsequently lost all their colours. No trace of any manipulation could be discovered on the shells.

This area has been surveyed by a team led by Diane Everman (1992) and she noticed the same features on the hills, except for the shells. She used the name Tell Tadwira for this group of hills. Several habitation layers were recorded by Everman which point to intense activity during antiquity. She reached the conclusion that most of the remains belonged to a late Roman seaside villa. A coin found by her on one of the floors was dated to the late 4th century, i.e. the Byzantine period.

Why so many Dove-shells were lying on top of this site will most probably remain an unanswered question.

Reference

Everman, D., 1992. Survey of the coastal area north of Caesarea and of the aqueducts: preliminary report. In: R.L. Vann (ed.), Caesarea papers. Straton's Tower, Herod's Harbour, and Roman and Byzantine Caesarea. *Journal of Roman Archaeology*, Supplementary Series, 5: 181-193.

Conference announcement

Third Independent Meeting of the Archaeomalacology Working Group

The third independent meeting of the International Council for Archaeozoology (ICAZ) Archaeomalacology Working Group will take place in Cairns, Queensland, Australia from 18-23 June 2012. AMWG members and prospective members with an interest in archaeomalacology are invited to participate.

Situated by the Great Barrier Reef and within the Australian tropical zone, Cairns has a range of accommodation options and local activities allowing attendees to experience tropical Pacific reef systems firsthand. Whether you dive, snorkel or would rather stay dry there are a wide variety of options on offer to suit a range of budgets and preferences.

The meeting will be focused around two broad themes:

Advancing method: The introduction of new techniques and the refinement of available methods allow us to ask new questions and probe existing ones with new depths or viewpoints. Presentations within this theme will be primarily focused on issues surrounding the development, refinement or questioning of analytical methods and the impact of these upon archaeological understandings.

Enhancing understanding: How can archaeomalacological data contribute to and enhance broader archaeological narratives? Going beyond site-specific reports, how can archaeomalacology address higher-level issues such as mobility patterns, environmental change and human response, subsistence regimes, trade networks and the changes through time of humans as a species? Presentations within this theme situate archaeomalacogical data and perspectives within the wider archaeological context.

If you are interested in attending, please return the completed registration form to Kat Szabó (kat.szabo1@gmail.com or kat@uow.edu.au). This is an online form and it can be found at: http://www.archaeomalacology.com/2012registration.html. Further details of the conference structure and proposed field trips and activities can be found on the website at: http://www.archaeomalacology.com/2012meetingdetails.html and also at: http://www.archaeomalacology.com/cairns2012.html.

If you have any queries, please contact either Kat Szabó (kat.szabo1@gmail.com or kat@uow.edu.au) or Sean Ulm (sean.ulm@jcu.edu.au).

We hope to see you there! **(Kat Szabó)**
