THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER
Issue Number 22, January 2013

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When I first started this newsletter in July 2001, I could not foresee that it would continue to grow and flourish right up to the present time. The success of the newsletter has been entirely due to its contributors and online hosts, to whom I remain extremely grateful. However, after nearly 12 years, and 22 issues, I feel it is now time for me to step down and hand the newsletter over to a new Coordinator.

Annalisa Christie, who has recently become the assistant coordinator for the ICAZ Archaeomalacology Working Group (AMWG), has kindly offered to take on responsibility for this newsletter. In future, therefore, please send all copy for the newsletter to Annalisa at annalisa.christie@yahoo.co.uk.

The newsletter welcomes short articles, reports of work in progress, requests for information, abstracts, reviews, notes – in fact anything archaeomalacological in its widest sense: dietary studies, palaeoenvironmental reconstructions, ancient trade routes, ornaments, tools, symbolism and more. Please continue to support it! All opinions expressed in the newsletter are those of the authors and not necessarily those of the Coordinator or online hosts. Current and previous issues of the newsletter are available at http://archaeomalacology.com and http://home.earthlink.net/~aydinslibrary/AMGnews.htm.

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Report on an experimental shell-working workshop

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One of the key obstacles to identifying and interpreting shell-working in the archaeological record is a paucity of experimental work and lack of a detailed knowledge of structural and taphonomic tendencies in shell. This has meant that the sort of technical 'know-how' that has underpinned lithic artefact analysis for many decades is largely absent in shell artefact analyses. A number of scholars have recognised this deficiency and are actively pursuing programmes of experimental research in order to expand our analytical toolkit (e.g. Francis, 1989; Avezuela, 2010; Murphy, 2011; Velázquez Castro *et al*., 2011).

The tropical Asia-Pacific region is twice-blessed in having myriad traditions of shell-working as well as a rich ethnographic literature. Whilst there are always dangers in directly applying ethnographic information to interpretations, this literature does offer us a large corpus of information upon which we can base experimental work. Additionally, the detailed study of ethnographic collections housed at museums can also provide insights into patterns of reduction and working in shell objects.

In September 2012, a group of research fellows and students with interests in shell and stone tool replication and experimental archaeology got together at the University of New England, Armidale, Australia, for a three-day shell-working workshop. The experiments itemised below were drawn from either literature descriptions of ethnographic shell-working, observations of reduction patterns on artefacts in museum collections, or direct observation of archaeological material. Analysis of the experimental artefacts and worked surfaces is ongoing with full analytical results being presented in due course. Here we simply present the range of experiments undertaken, the justifications for each and observations on results where appropriate.

Polymesoda erosa (Corbiculidae) as a vegetable peeler

This large, robust brackish-water clam is a staple of expedient toolkits across Island Southeast Asia and Melanesia, with the closely related *Batissa violacea* also being used where it is more plentiful in local environments. From rice grain harvesting (Fox, 1970) to various cutting, scraping and food serving tasks (Szabó, pers. obs., ethnographic artefacts in the Regenstein Pacific Collections, Field Museum of Natural History, Chicago, 2010, 2011), the morphology, robustness, sharp ventral margin and abundance of the *Polymesoda erosa* valve makes it ideal for the processing of food.

This experiment focused on testing the effectiveness of peeling the Asia-Pacific starch staple taro (*Colocasia esculenta*) using valves of *P. erosa*. The action used to remove the outer layer of the taro was left to be determined by the user, in this case, Kim Newman. A box of approximately 25 corms of taro was bought and a number of valves designated for the experiment. The combination of the sharp edge and rigidity of the *P. erosa* valve proved extremely effective in removing the skin of taro through peeling. In hindsight, assigning several separate valves for this experiment was excessive, as one valve was able peel the entire box. Damage to the shell was minimal; removal of the outer periostracum and minor edge chipping were the only examples of damage apparent.

Polymesoda erosa (Corbiculidae) as a pressure flaker

Continuing with the theme of expedient use of *Polymesoda erosa*, the feasibility of using a valve to pressure flake stone was also tested. The use of the ventral margin of a *P. erosa* valve to pressure flake stone drill tips was described by Woodford (1908) as a part of the process of shell bead money production on the island of Malaita in the Solomon Islands. Records of the use of shell to work stone are rare, and we were interested to see how successfully the method described by Woodford could be executed, and to observe the resulting damage to the ventral margin of the shell.

Using flakes that were already prepared, the edge of the valve was pressed to the edge of the stone flake on an anvil and an increasing amount of pressure applied in an attempt to remove a piece of stone. The shell consistently removed micro-flakes from the stone in a controlled manner, not unlike more traditional pressure flakers. Damage to the shell consisted of a crushing of the margin, but was minimal compared to the amount of, and manner in which, material was removed from the flake.

Using fire to reduce *Pinctada maxima* (Pteriidae)

Ethnographic accounts of different groups in the New Guinea Highlands describe the use of fire to remove unwanted portions of the *Pinctada maxima* (gold-lipped pearl oyster) valve in the reduction sequence to create highly valued *kina* and *moka* pendants (Strathern, 1971; Sillitoe, 1988). These pendants are a central form of wealth in the Highlands and are a key element of extensive exchange networks (Strathern, 1971). The use of fire to reduce shell seems counterintuitive given its destructive effect. Thus, without carefully controlling the destructive effects of fire, this method of shell reduction cannot be used.

Both Strathern and Sillitoe describe coating the desired portion of the valve in damp clay and placing it in an open fire, so we did the same. Whole valves of *P. maxima* had the ventral margin coated in a thick layer of moistened clay and were then placed in an open wood fire. After half an hour the valves were removed from the fire and the clay peeled off. This experiment yielded excellent results. The portion of the shell that was not coated with clay and was therefore exposed to the flames was completely destroyed. The shell was dull, flaky and could be crumbled between the fingers with minimal effort. The shell protected by the clay, however, remained pristine and undamaged, despite the fire reaching 599 degrees Celsius. A very distinct boundary between damaged and undamaged shell was apparent. This is attributed to the extremely effective insulating effects of the moist clay, so much so that the clay was still wet when it was peeled from the shell.

Inducing colour change using heat in *Chama pacifica* (Chamidae) and *Spondylus* spp. (Spondylidae)

Beads made of *Chama pacifica* and *Spondylus* spp. are common within the western Melanesian (and Micronesian) archaeological and ethnographic records (e.g. Woodford, 1908; Goto, 1996; Burt, 2009). Ethnographic studies describing the production of such beads in the southern Solomon Islands mention heat treating *Chama pacifica* and *Spondylus* spp. as a way of deepening the highly-prized red colour of the beads (Woodford, 1908; Goto, 1996).

This experiment attempted to induce this colour change using heat generated from fire. Upper and lower valves of both *Chama pacifica* and *Spondylus* spp. were broken into fragments and covered with sand. The fire was then built directly above the buried shell pieces. A thermometer-probe was placed in the centre of the buried shell formation and the temperature was recorded at regular intervals. The fire was allowed to die down naturally and the shell fragments remained buried overnight.

When the fragments were excavated the following day, the pieces of both *Chama pacifica* and *Spondylus* spp. had not undergone the desired colour change. The bright colours normally associated with the shells had been lost and had turned a uniform dull grey. The structural integrity of the shells was also lost and had become brittle and easily crumbled. Apparently the contact with the fire was of too long a duration, or the heat was too intense. Heating without the beads in such close proximity to fire, such as on an iron plate held over a stove as described by Goto (1996), will be trialled to see if and how the results differ.

Production and modification of *Turbo marmoratus* (Turbinidae) and *Nautilus belauensis* (Nautilidae) tablets

The use of the large shells of *Turbo marmoratus* and *Nautilus pompilius* for artefact production has been well documented (Bautista, 1996; Szabó, 2005). However, the complex microstructure of these two species leads to very complex fracture patterns which are easily misinterpreted (Szabó, 2005, 2008). Controlled fracture of shell is more difficult to achieve than that of a more homogenous material like stone and is strongly influenced by the multidirectional layers that form the shell as well as by the shaped and ornamented morphology of the hard tissue (Vermeij, 1993). The present researchers aimed to use percussion (both direct and indirect) to reduce whole *T. marmoratus* and *N. belauensis* to create tablets as large as possible, such as those generated for rotating fishhook production (Szabó, 2007).

Reduction of T. *marmoratus* began using indirect percussion anterior of the thick ridge at the shoulder of the body whorl. Initially this proved to be successful, with a tablet approximately 10 cm long and 5 cm wide being isolated. However, further percussion resulted in the fracture and removal of the tablet. An attempt was made to continue using this method after the initial tablet was removed, but because of the exponential decrease in whorl surface area associated with the spiralling shell, it was difficult to isolate an area large enough to form a viable tablet.

Direct percussion was used to reduce *N. belauensis*. The shell, while hard and tough, proved brittle. One strike at the body whorl resulted in complete catastrophic failure of the majority of the shell not supported by the interior whorls and septal walls. Controlling the fracture patterns in *N. belauensis* was much more problematic than in *T. marmoratus* and resulted in more haphazard tablet formation. Thanks to the large size of the *N. belauensis* shell, some of the fragments that were detached were quite large.

Evidence exists of further modification to *N. belauensis* pieces (see Szabó, 2005 for *Nautilus pompilius*). Examples of what are thought to be scoring marks in archaeological *N. pompilius* pieces have been found (van den Bergh *et al*., 2009). Tablets of *N. belauensis* created in the direct percussion experiment were modified in an attempt to recreate the patterns seen in the archaeological record. Placing the tablets on an anvil, a sharp stone flake was used to score a line across the nacreous face of the shell. Repeating this motion along the same line gradually produced a deeper cut. Once the nacreous layer was penetrated and the spherulitic layer was exposed, the tablet was snapped along this cut. The resulting edge was very straight and regular. Attempts to snap the tablet prior to penetrating the nacreous layer were unsuccessful due to the fragment still being extremely rigid. Once the nacreous layer was entirely scored, snapping the piece was relatively easy. This technique proved simple to do and, most importantly, extremely effective. The microscopic examination of the cut edge that will be undertaken in the future will determine in detail the similarities and differences between archaeological and experimental specimens.

Nassarius pullus (Nassariidae) bead production using indirect percussion

Extensive examples exist of archaeological and ethnographic artefacts incorporating beads of *Nassarius pullus* and other *Nassarius* species with a well-developed parietal callus. Whole shells have the dorsum removed which allows many beads to be sewn onto or embedded in other objects, or strung together for use as shell money or adornment. During examination of museum collections, it was noted that a notch was consistently apparent adjacent to the siphonal canal (Szabó, pers. obs.). This notch was not associated with the natural morphology or sculpture of the *N. pullus* shell and is thought to be diagnostic damage caused in the process of removing the dorsum.

We could not locate an ethnographic account for the production process of these beads. However, if the notch near the siphonal canal is associated with the removal of the dorsum, and the location of the notch is in relation to the sculpture of the shell, then it can be inferred that indirect percussion was the most likely process of reduction utilised. An initial problem using this method was that of securing the shell when the blow was struck. A number of different methods were used but the most effective was inserting the shell into a letter in stamped concrete, in this case the letter ‘E’. This provided firm support for the shell when the strike came, with minimal shifting of its position to cause the percussion point to slip. The point was aligned in the groove next to the siphonal canal, and above the anterior part of the parietal callus.

What resulted was an inconsistent series of fractures. The first few attempts either failed to detach the dorsum in the desired fashion, resulted in catastrophic failure of the entire shell, or the point slipped resulting in no damage. As the experiment progressed, examples were generated of complete detachment of the dorsum after one strike. Practice makes perfect. This, along with an observed notch in the same location as in the archaeological specimens, created very similar beads to the observed ethnographic samples. It should be noted, however, that producing consistent examples of adequate beads was problematic and failure was a common occurrence. Notwithstanding, indirect percussion does seem to be a suitable method for producing these types of beads.

Conclusion

Interpreting the surfaces of worked shell has been, and continues to be, challenging. The diversity of shell as a raw material and the variable impacts of taphonomic processes make both working procedures and final results diverse. Experimental working is one way of gaining not only a greater understanding of different types of shells as raw materials, but of generating a robust material library for comparison. The growth of this type of research in recent years is promising, and through collaboration and data-rich publications we now have the opportunity to develop this hitherto neglected area of archaeological research.

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Shell beads made of cone shells from an Early Bronze I tomb at the Azor-Holon cemetery, Israel

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The excavation of Burial Cave 2 in the Azor-Holon cemetery carried out by Asher Ovadiah in 1968 resulted in the finds, among others, of two shells (Mienis in van den Brink, Gophna and Ovadiah, 2007: Fig. 9: 3). They were found in the spoil of a tomb and both belonged apparently to a single species of the genus *Conus.* Both shells showed a man-made hole in the top. These holes were most probably made by rubbing the apex of the shells over a firm object, probably a stone. In this way these cone shells had been turned into shell beads. More general information concerning the use of cone shells can be found in Reese (1983).

The identity and origin of the material are more problematic. Only one species is known to live in the Eastern Mediterranean and not less than 28 species in the northern part of the Red Sea, i.e. the Gulfs of Aqaba and Suez (Fainzilber, Mienis and Heller, 1992 and unpublished information). The general form of the shell, which has more or less straight conic sides with a flat top, rules out the Mediterranean *Conus mediterraneus* Hwass, 1792. This species has a more pointed, conical apex and would have revealed a much larger hole in the top if ground down to the level as shown.

Several *Conus* species from the Red Sea are more likely candidates for the raw material of these shell beads, especially *Conus flavidus* Lamarck, 1810. However, lack of traces of the colour pattern and details of the original micro-sculpture of the apical whorls does not allow a more specific identification. In respect of *C. flavidus*, it is noteworthy that 12 shells belonging to that species, all with a man-made hole in the apex, have been found in a cave dating to the Late Chalcolithic period near Sha'ar Efrayim (Mienis, 2011).

Cone shells holed in a similar way have been reported from a number of other EB I sites in Israel and Palestine. For example, shell beads made from *Conus mediterraneus* have been reported from Tell Ta'annach (Ezzughayyar and Al-Zawahra, 1996) and Megiddo (Bar-Yosef Mayer, 2000), while a bead made from *Conus textile neovicarius* Da Motta, 1982, a Red Sea species, has been excavated at Gesher HaBesor (Horwitz *et al.*, 2002).

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Book notice: *Olivella* shell bead guide

***California and Great Basin* Olivella *shell bead guide* by R.T. Milliken and A.W. Schwitalla, published July 2012. Walnut Creek, California, Left Coast Press. 88 pp., 180 colour photographs. ISBN 9781611322323.**

Several types of *Olivella* shell beads were manufactured at archaeological sites in California from at least the early Late Archaic period (c. 4000-2000 BC) onwards. These take the form of modified complete shells and variously-shaped flat beads cut from the body whorl and/or the columellar callus. These beads were traded far inland and by the Late Pacific period (c. AD 500-1500) had begun to be used as a medium of exchange.

The distinctive patterns of shell bead manufacture provide important chronological, morphological and distributional information. The authors of this book, described by the publisher as a professional artefact replicator and an acknowledged expert on archaeological shell bead typology, present a 16-category typology which includes descriptive, metric and temporal characteristics. The book is spiral bound to facilitate field and laboratory work, and should be a useful tool for students of prehistoric shell beads in the American Southwest.

Molluscs from a Roman-Byzantine water reservoir near Tel Goded, Judean Foothills, Israel

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An ancient water reservoir was discovered near Tel Goded (Tell el-Judeidah), Judean Foothills, Israel, during an emergency excavation carried out on behalf of the Israel Antiquities Authority by H. Khalaily and N. Sagiv in February-March 1994. This water reservoir turned out to be an integral part of the northern water supply system to Eleutheropolis, which is today better known as Bet Guvrin. This monumental reservoir, with a size of approximately 85 x 15 m, had been built in two stages: the first stage dates back to about the reign of Trajanus (AD 98-117), and the second stage to the reign of Constantius II (AD 337-340) (Sagiv, Zissu and Avni, 1997).

The sediments near the bottom of the reservoir contained the remains of some molluscs. A small sample collected by N. Sagiv on 29 March 1994 had been forwarded to the author for further study. In the wake of the preliminary results a second bottom sample was taken from the reservoir by N. Sagiv and the author on 1 July 1994. The material was found to contain the remains of 17 species of land and freshwater molluscs and one freshwater crab.

Systematic list

The molluscs found in sediments on the bottom of the Roman-Byzantine water reservoir near Tel Goded were identified by H.K. Mienis (gastropods) and the late J.G.J. (Hans) Kuiper (bivalves). (Abbreviations: TAU MO = Mollusc Collection of the Tel Aviv University; > = more than.)

GASTROPODA
Family Hydrobiidae
Globuliana gaillardoti (Germain, 1911) – TAU MO 54479/2.

This species is also known as *Mienisiella gaillardoti* and *Islamia gaillardoti*.

Family Cochliopidae
Heleobia (Semisalsa) contempta (Dautzenberg, 1894) – TAU MO 54485/1.

Family Melanopsiidae
Melanopsis buccinoidea (Olivier, 1801) – TAU MO 54487/>50 and 72183/>20.

Family Valvatidae
Valvata (Cincinna) saulcyi Bourguignat, 1853 – TAU MO 54486/1.

Family Planorbiidae
Bulinus (Isidora) truncatus (Audouin, 1826) – TAU MO 54480/>20.
Gyraulus (Gyraulus) piscinarum (Bourguignat, 1852) – TAU MO 54482/1.

Family Ferussaciidae
Calaxis hierosolymarum (Roth, 1855) – TAU MO 72182/13.
Calaxis moussoniana (Bourguignat, 1864) – TAU MO 54484/1.
Calaxis rothi (Bourguignat, 1864) – TAU MO 54483/1.
Calaxis saulcyi (Bourguignat, 1864) – TAU MO 72178/>10 and 72181/2.
Cecilioides acicula (Müller, 1774) – TAU MO 54481/1.

Family Oxychilidae
Oxychilus species – TAU MO 54477/1.

Family Limacidae
Limacus flavus (Linnaeus, 1758) – TAU MO 54478/1 internal shell.

Family Hygromiidae
Monacha obstructa (Pfeiffer, 1842) – TAU MO 72179/3 fragments.
Xeropicta vestalis joppensis (Schmidt, 1855) – TAU MO 72180/2 fragments and 72184/1.

BIVALVIA
Family Sphaeriidae
Pisidium (Odhneripisidium) annandalei Prashad, 1925 – TAU MO 54475/ >20.
Pisidium (Euglesa) casertanum (Poli, 1791) – TAU MO 54476/>20.

In addition, two fragments were found of the Levantine freshwater crab *Potamon potamios* (Olivier, 1804).

Remarks

According to the size of the reservoir and the length of the aqueduct to Bet Guvrin, the water supply during Roman times was quite different from that of today in the surroundings of Tel Goded. Today not a single spring is indicated on the map in the vicinity of the reservoir, and no permanent streams are present in the area. Yet according to the presence of *Globuliana gaillardoti*, *Heleobia contempta*, *Melanopsis buccinoidea*, *Valvata saulcyi* and both species of *Pisidium*, there must have been a constant supply of running water in the channel of the aqueduct and the reservoir. The presence of *Bulinus truncatus* and *Gyraulus piscinarum* indicates that most probably dense aquatic vegetation was growing in the reservoir. This is confirmed by the presence of numerous characteristic seed vessels of one or more species of *Chara*. The reservoir ceased to function at the end of the Byzantine or beginning of the Early Islamic period, which coincides with similar events in the Negev and Arava Valley (Hirshfeld, 2004 and unpublished studies of malacological material by H.K. Mienis from various excavations in those areas).

Acknowledgement

I would like to thank the late J.G.J. (Hans) Kuiper (1914-2011) for his identifications of the *Pisidium* samples.

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Land and freshwater molluscs recovered during the excavation of Area B at Yavneh-Yam, Israel

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The land and freshwater molluscs recovered during the excavation of Area A of Yavneh-Yam, Israel, have been briefly discussed by Mienis (2010). A total of 177 shells or fragments belonging to ten different species were recognised. Most of the shells were found in layers representing the Persian period (5th to 4th centuries BC).

Area B, situated to the north-east of Area A, was also excavated by Prof. Moshe Fischer of Tel Aviv University (Fischer, 2005). Among the archaeomalacological remains which were collected for further study, only ten represented inland (non-marine) molluscs. They are discussed in this brief report.

Results of the study

The ten inland mollusc shells belonged to five different species.

GASTROPODA
Family Hygromiidae
Xeropicta vestalis joppensis (Schmidt, 1855)
Locus 650: one shell.

Family Helicidae
Helix engaddensis Bourguignat, 1852
Locus 645: one shell; Locus 646: one body whorl; Locus 653: one disintegrated shell.

Theba pisana (Müller, 1774)
Locus 609: one disintegrated shell; Locus 644: one shell.

BIVALVIA
Family Unionidae
Unio mancus eucirrus Bourguignat, 1857
Locus 535: one large umbonal fragment; Locus 551: one fragment of the ventral margin; Locus 659: one disintegrated fragment.

Family Mutelidae
Chambardia rubens arcuata (Cailliaud, 1823)
Locus 538: one umbonal fragment.

Discussion

The shells belonging to inland species originated from three different areas. The land snails *Xeropicta vestalis joppensis*, *Helix engaddensis* and *Theba pisana* were without doubt living close to or even within the site. The two species of freshwater mussels, *Unio mancus eucirrus* and *Chambardia rubens arcuata*, arrived at the site from two different areas. The *Unio* had been collected most likely in Wadi Rubin (= Nahal Soreq), just north of Yavneh-Yam, while *Chambardia* had been brought to the site from the river Nile in Egypt.

The inland shells were found in layers dating to the Hellenistic, Byzantine and Early Islamic periods (Table 1).

Table 1: The inland molluscs from Area B of Yavneh-Yam according to the age of the layers in which they were found

Archaeological Period	Hellenistic	Byzantine	Early Islamic
Centuries	3-2 BC	5-7 AD	7-8 AD
Species			
Xeropicta vestalis joppensis	-	-	1
Helix engaddensis	-	2	1
Theba pisana	-	1	1
Unio mancus eucirrus	2	1	-
Chambardia rubens arcuata	-	1	-
Total	2	5	3

It is rather difficult to compare the finds from Area B with those of Area A because the latter area was much larger and covered the remains from more historic periods (Table 2).

Table 2: A comparison of the inland molluscs found in Areas A and B at Yavneh-Yam

Species	Area A	Area B
Pila ovata	1	-
Melanopsis buccinoidea	1	-
Monacha obstructa	1	-
Monacha syriaca	7	-
Xerocrassa davidiana	1	-
Xeropicta vestalis joppensis	40	1
Helix engaddensis	116	3
Levantina spiriplana caesareana	1	-
Theba pisana	3	2
Unio mancus eucirrus	6	3
Chambardia rubens arcuata	-	1
Total	177	10

When only the results from the Hellenistic, Byzantine and Early Islamic periods of Areas A and B are compared (Table 3) then the differences are less conspicuous.

Table 3: A comparison of the inland molluscs found in Areas A and B in the Hellenistic, Byzantine and Early Islamic layers at Yavneh-Yam

Archaeological Period	Hel.	Hel.	Byz.	Byz.	E-Isl.	E-Isl.
Area	A	B	A	B	A	B
Species						
Monacha syriaca	-	-	-	-	1	-
Xerocrassa davidiana	-	-	-	-	-	-
Xeropicta vestalis joppensis	-	-	-	-	2	1
Helix engaddensis	-	-	3	2	13	1
Levantina spiriplana caesareana	1	-	-	-	-	-
Theba pisana	-	-	-	1	3	1
Unio mancus eucirrus	1	2	-	1	-	-
Chambardia rubens arcuata	-	-	-	1	-	-
Total	2	2	3	5	19	3

Conclusion

The inland molluscs found during the excavation of Area B at Yavneh-Yam warrant little interpretation. From a zoogeographical point of view we can only state that the shells originated from three different areas. The three species of terrestrial snails were probably living at the site, while the *Unio* species arrived most likely from the nearest river (Wadi Rubin = Nahal Soreq) not far north of the site. The most interesting find consisted of the umbonal fragment of *Chambardia rubens arcuata*, a Nilotic freshwater mussel. It was probably brought to the site from Egypt because of its interior layer of rose-coloured mother-of-pearl. However, we can only guess the reason why it was imported by the Byzantine inhabitants of Yavneh-Yam.

Acknowledgement

I would like to thank Prof. Moshe Fischer (Tel Aviv University) for entrusting me with the discussed material.

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Note on a former aquatic molluscan fauna from Nahal Lakhish in Ashdod, Israel

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It is a well-known fact that during historic times the climate in Israel was much wetter than it is today. Many of the coastal rivers which are now ephemeral streams, i.e. they carry water only during the rainy season, were in the past perennial streams and carried water the whole year round. Evidence of such wetter periods may be present here and there along the banks of ephemeral streams in the form of layers containing the shells of freshwater molluscs which live exclusively in running water.

During fieldwork carried out on 8 November 1988 in Nahal Lakhish in Ashdod such depositions were located about 200 m west of the bridge over Nahal Lakhish near the Bnai Brith Boulevard (New Israel Grid 169/637). In the middle of the riverbed two layers were discovered which contained large numbers of freshwater molluscs and some amphibious terrestrial snails. The two layers were separated by a thin layer of gravel and both layers contained fragments of pottery. Unfortunately these pottery fragments were too worn to allow any positive dating of the layers. The presence of ten different species of molluscs was established (Table 1).

The molluscan remains found in the lower layer are characteristic of a slow flowing stream with an abundance of aquatic vegetation and carrying water the whole year round. The fauna of the upper layer is more characteristic of a marshy habitat. The disappearance of the three prosobranch taxa (*Valvata*, *Melanoides* and especially *Melanopsis*) point to a situation where the stream stopped carrying water the whole year round but still provided enough water to create a marshy type of wetland.

Table 1: Aquatic and amphibious molluscs encountered in two layers in Nahal Lakhish in Ashdod, Israel

Species	**Lower layer**	**Upper layer**
Valvata saulcyi Bourguignat, 1853	+	-
Melanoides tuberculata (Müller, 1774)	+	-
Melanopsis buccinoidea (Olivier, 1801)	+	-
Radix natalensis (Krauss, 1848)	+	+
Bulinus truncatus (Audouin, 1826)	+	+
Planorbis planorbis antiochianus Locard, 1883)	+	+
Gyraulus piscinarum (Bourguignat, 1852)	+	+
Oxyloma elegans Risso, 1826	-	+
Pisidium casertanum (Poli, 1791)	+	+
Pisidium annandalei Prashad, 1925	+	+
Total	9	7

Today the examined area of Nahal Lakhish is completely dry and carries water only occasionally during short periods of flash floods in the rainy season.

Abstracts

Galili, E., Sevketoglu, M., Salamon, A., Zviely, D., Mienis, H.K., Rosen, B. and Moshkovitz, S., 2012. Late Pleistocene and Holocene beach deposits and archaeological features on Cyprus and Israeli coasts, markers of sea levels and vertical earth movements. pp. 13-14. In: Rovere, A. *et al*. (eds), *MEDFLOOD first meeting, abstract booklet, Rome, September 25th, 2012*. Rome, Istituto Nazionale di Geofisica e Vulcanologia.
ABSTRACT: Fossil beach deposits on the Carmel coast, Israel (n=10) and coastal sites in Cyprus (n=20) were examined and compared with a view to elucidating sea level (SL) changes from the Late Pleistocene onwards. In Israel the cemented beach deposits included shells of *Persististrombus latus*, which is an index fossil for the last interglacial maximum (about 125 kyr BP). This species was also found in four of the Cyprus beach deposits. The lithology and chronostratigraphy of the beach deposits suggest that the maximum vertical displacement of the Carmel coast was +4 m with an average rate of 0.04 mm/year. In Cyprus sections of the north coast appear to have been uplifted by at least 16 m (0.128 mm/year) compared with 6 m (0.048 mm/year) in southern Cyprus. However, the postglacial SL rise since the human colonisation of Cyprus has been about 50 m and remains the dominant factor in coastal modification. Roman and Byzantine rock-cut fish basins in Cyprus and Israel have retained their elevations at or close to the present day SL, suggesting no significant SL change during the last 2 kya. **(JRS)**

Horwitz, L.K., Hellwing, S., Lernau, O. and Mienis, H.K., 2012. The faunal remains and the function of the site. pp. 327-340. In: Freud, L. (ed.), *Kuntillet ʻAjrud (Ḥorvat Teman): an Iron Age II religious site on the Judah-Sinai border*. Jerusalem, Israel Exploration Society.
ABSTRACT: A small faunal assemblage recovered during excavations at Kuntilletʻ Ajrud included four species of molluscs. Single shells of *Glycymeris insubrica* and *Stramonita haemastoma* originated from the Mediterranean Sea, some 120 km away. The money cowry *Monetaria moneta* was represented by three shells: this species is now extremely rare in the northern part of the Red Sea (90 km away) but becomes more common in the Gulf of Aden and the Indian Ocean. A columella of the spider conch *Lambis truncata sebae*, from the Red Sea, was also recovered. The original material has unfortunately been lost and no further assessment could be made. The location of the Mediterranean shells and the cowries in and adjacent to bench-rooms on either side of the entrance to Building A suggests they may have

served as votive offerings. The spider conch columella was found in the courtyard of the building but the function of the object that was made from this shell is unknown. *Monetaria* spp. have been recorded from other Iron Age II sites in the southern Levant and may have functioned as amulets and charms. **(JRS)**

Mienis, H.K., 2012. The faunal remains: B. Shells. pp. 367-378. In: Zortal, A. (ed.), *El-Ahwat: a fortified site from the Early Iron Age near Nahal ʽIron, Israel. Excavations 1993-2000*. Leiden and Boston, Brill.

ABSTRACT: The 137 molluscan samples recovered from this site, probably as small finds or as the result of large-mesh sieving, consisted of 268 whole shells and fragments and 21 different taxa. These comprised one freshwater, 11 marine (nine gastropod and two bivalve), eight land and one fossil species. The land snails represent present-day taxa and suggest that either similar environmental conditions prevailed in the Early Iron Age, or the samples were contaminated. The two large land snails, *Helix engaddensis* (n=36) and *Levantina spiriplana caesareana* (n=45) occur in relatively large numbers and could represent food. However, there is no direct evidence for this except, perhaps, for the presence of relatively large numbers of palatal lips of *Levantina* which do not represent a natural breakage pattern. All the marine shells were beach-rolled and were not collected live for food. Man-made holes in *Nassarius circumcinctus* (n=1), *Nassarius gibbosulus* (n=3) and *Conus mediterraneus* (n=1), and also the freshwater *Melanopsis buccinoidea* (n=1), suggest their use as beads, and the Red Sea cowries *Monetaria annulus* (n=1) and *Monetaria moneta* (n=1) had both had the dorsum removed. Of 139 *Glycymeris cor* (=*Glycymeris insubrica*), 39 were naturally or artificially holed and may have served as pendants. The six *Phalium granulatum undulatum* were all represented as ‘cassid lips’ which may have had an ornamental function. Other worn and broken shells may have been imported as building material, and one valve and one umbonal fragment of *Glycymeris* were found cemented together. With the exception of the cowries, which suggest possible trade contact with Egypt, all the marine species came from the Mediterranean, some 18 km west of the site. **(JRS)**

Conference reports

3rd Independent Meeting of the ICAZ Archaeomalacology Working Group (AMWG), Cairns, Australia, 19-23 June 2012

Attended by over 20 delegates from eight countries worldwide, the conference was divided into two sessions: ‘Enhancing narrative’ and ‘Advancing methods’. Fourteen papers and three posters were presented over three days (Tuesday 20th, Thursday 22nd and Friday 23rd). The presentations reflected the diversity of archaeomalacological research currently conducted by members of the group and covered a range of thematic topics – from qualitative analysis (Annalisa Christie and Katherine Szabó) and experimental archaeology (Brent Koppel) to advanced scientific methods (Zhanna Antipushina and Sean Ulm) and quantitative analysis (Eddie Thangavelu and Catherine Dupont). All papers highlighted the rich potential for methodological development and regional research in the future.

The papers (both presented and proposed) also demonstrated the global coverage of the group, documenting research from five regions worldwide including the Pacific, Europe, Asia, Africa and South America – a fact that bodes well for the future development of the group.

The conference schedule allowed plenty of time for discussion. Following the nomination of the new coordinator (Zhanna Antipushina) and assistant coordinator (Annalisa Christie), an extended period was spent discussing future directions for the AMWG.

The group has now reached a 'critical mass' of over 100 members worldwide, covering a range of specialities and research areas within archaeomalacology. As such, one avenue for future development could be the initiation of thematic forums within the group set up online to facilitate enhanced dialogue within and between specialisms. These web-based forums could provide members with an opportunity to consolidate their research strategies with the aim of producing a manual that would cover current approaches in archaeomalacology.

In light of the conference location, fieldtrips were arranged to provide delegates with an opportunity to experience the rich natural and cultural heritage of Queensland. Building on from a lecture on the ecology of the Great Barrier Reef by 'Reef Teach' on the Monday afternoon, delegates were taken to one of the reefs where they could experience the ecology in person, either by snorkelling, diving, or viewing from the surface using a semi-submersible or glass-bottomed boat.

The conference was followed by a daytrip to the Daintree River which included a guided walk through the rainforest and a long afternoon spent exploring the inter-tidal zone and mangroves with representatives of the Kuku Yalanji people. Here the delegates observed traditional exploitation practices, listened to stories about the sea, learnt how to handle and throw a spear, and were encouraged to catch their own food for an afternoon snack. **(Conference report by Zhanna Antipushina and Annalisa Christie)**

The next AMWG Meeting will take place at ICAZ 2014 and will be organised by Zhanna Antipushina and Annalisa Christie (amwg.icaz@gmail.com)

1st Academic Meeting of the ICAZ Neotropical Zooarchaeology Working Group (NZWG), Santiago, Chile, 1 June 2012

This 1st Academic Meeting of the NZWG was conceived of as a workshop framed around two sessions: one on the nature and characteristics of neotropical zooarchaeological records, and one on the diversity of human-animal interactions in the neotropics through time. Ten papers were presented by authors from Argentina, Brazil, Chile, Colombia, Cuba, France, Mexico, Peru and Uruguay, representing a wealth of topics and approaches in the study of neotropical archaeofaunas.

Contexts with malacological remains held an important place among the presentations, including the analysis of shell middens from marine coastlines and inland lagoons and rivers. It is intended that the papers will be published in the journal *Etnobiología*. Please refer to the website http://alexandriaarchives.org/bonecommons/items/show/1848 for the programme meeting and abstracts. (This information was taken from the NZWG Newsletter no.3 for September 2012, which is available, with previous NZWG newsletters, online at http://www.alexandriaarchives.org/bonecommons/exhibits/show/nzwg.) **(JRS)**

Forthcoming conferences

Joint UK Archaeological Sciences (UKAS) and Association for Environmental Archaeology (AEA) Spring Meeting, Cardiff, UK, 11-14 April 2013

The primary aim of this conference is to promote collaboration and dialogue between archaeological scientists, including those involved in environmental research. Please refer to the University of Cardiff website, http://www.cardiff.ac.uk/share/newsandevents/, for further details.

World Congress of Malacology (WCM 2013), Ponta Delgada, São Miguel, Azores, 21-28 July 2013

This congress is open to all contributions in the field of malacology and will host symposia as well as other contributed papers and posters. Further details are available at the Unitas Malacologica website at http://www.unitasmalacologica.org/congress.html and the American Malacological Society website at http://www.malacological.org/meetings/index.php.
