THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER
Issue Number 16, December 2009

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Editorial

I would like to thank all the contributors to this issue of the AMG Newsletter for giving us such a variety of topics, ranging from the relative survival of right and left oyster valves from British contexts (this page) to the reassessment of an 'ivory' fragment from an Iron Age site in Sinai (page 8), and from the use of *Charonia* trumpets in the Aurignacian (page 12) to another possible ancient land snail introduction in the eastern Mediterranean (page 10).

The distribution of *Papillifera bidens* continues to be of interest (page 3), and it should be noted that a recent paper (Kadolksy, 2009) has again questioned the identity of this peripatetic snail. It is argued that the nominal species *Turbo bidens* Linnaeus, 1758 was incorrectly identified with *Papillifera papillaris*, based on a misinterpretation of the original diagnosis. It now appears that *Turbo bidens* is another clausiliid, *Cochlodina bidens*, and that *Papillifera bidens* – is *Papillifera papillaris*. It remains to be seen whether the author's conclusions find acceptance by the scientific community.

Please keep those contributions coming in to ensure the publication of another interesting AMG Newsletter at the end of June 2010. Short articles, abstracts of publications, book reviews, research and conference reports, news – anything with an archaeomalacological flavour will be welcomed. All items and correspondence should be sent as Word documents to me at the email address given above.

Thanks are due as always to Kat Szabo of the ICAZ Archaeomalacology Working Group and to Aydın Örstan for posting this and previous issues of the AMG Newsletter on their websites at http://triton.anu.edu.au/ and http://home.earthlink.net/~aydinslibrary/AMGnews.htm, respectively. **(JRS)**

Reference

Kadolsky, D., 2009. *Turbo bidens* Linnaeus 1758 (Gastropoda: Clausiliidae) misidentified for 250 years. *Journal of Conchology*, 40 (1): 19-30.

Different rates of survival for left and right valves of European oyster (*Ostrea edulis* L.) from archaeological sites in Britain

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The right (upper, flat) valves of *Ostrea edulis* L. are often recovered from archaeological excavations in higher quantities than the left (lower, cupped) valves (Winder, 1992: 194), although this is not always the case. In order to determine the extent of this trend, a total of 29,532 records of individual oyster valves from 44 sites were analysed. These valves were from assemblages either originally examined by one or other of the authors, or were found in an online repository of specialist reports, either those of Wessex Archaeology (http://www.scribd.com/wessexarchaeology), or the Centre for Human Palaeoecology at York

University (http://www.york.ac.uk/inst/chumpal). All of the sites were in the United Kingdom.

Of the 29,532 valves recorded, 15,774 (53%) were right valves. Twenty-seven of the 44 sites (61%) yielded assemblages with more right than left valves. The mean percentage of right valves from sites in this group was 54.4% (± 1.57), and the median was 52.5%. In order to assess the statistical significance of this trend, data from 30 sites where the combined assemblage of left and right valves was greater than 100 were examined. Twenty (67%) of these sites yielded more right than left valves. The mean percentage of right valves from these sites was 53.7% (±1.00), and the median was 52.9%. A Wilcoxon paired samples test (*e.g.* Soskal and Rohlf, 1969: 391-392) revealed that the difference in median values between right and left valves is statistically very significant ($p = 0.005$).

As a preliminary attempt to examine whether the age of the shell sample might be a factor in the survival rate, individual contexts with a combined assemblage of more than 100 were examined. Of 20 contexts of 4th century date or earlier, 15 (75%) contained more right valves than left. The mean percentage of right valves from these contexts was 54.1% (± 1.5), and the median 54.2%. Results from seven contexts of 15th century date or later were also analysed. Six of these (86%) yielded more right than left valves. The mean percentage of right valves from these contexts was 56.2% (±1.15), and the median 56.2%. These are fairly small samples; however, it does seem that the trend continues regardless of the age of the sample.

The trend for survival of more right valves may relate to a number of factors, such as the effect of taphonomic processes and the different physical properties of the two valves, as well as the deliberate separation of valves prior to deposition. Physically, right valves are more robust, with more compact layering than left valves. The cupped shell is also more liable to breakage under pressure than the flat valve, and the crystal structure and the type of shell layers in left valves make them more vulnerable to disintegration. Older left valves may have hollow chambers (Milner, 2002: 13) and are frequently perforated by epibiont organisms. Plant roots and water can also enter the outer growth surfaces of left valves, or ruptured chambers of the interior surface.

In other cases, the difference in the proportion of valves in the samples is so marked that it seems safe to deduce that the separation of the valves into different contexts is the result of deliberate human action. For example, oysters are frequently opened in the food preparation area and the meat served on the left cupped valve along with the liquor; the right valves are left in the kitchen. At Ludgershall Castle in Wiltshire the right valves mostly ended up in a midden outside the kitchen together with the most infested or irregular left valves. The regular shaped left valves lacking infestation or encrustation were recovered from the king's own latrine adjacent to the 'banqueting' area (Winder, 2000: 242).

This apparent trend is, however, not a rule, and some contexts may show vastly different proportions of left to right valves. Possible reasons for this might include additional depletion processes such as the reuse of oyster valves, or valves being deposited outside of the excavation sample area.

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The *Papillifera bidens*-complex along the coast of the eastern Adriatic Sea

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The land snail *Papillifera bidens* (Linnaeus, 1758) [= *P. papillaris* (Müller, 1774)] is without doubt the most anthropogenic species among the Clausiliidae occurring in the Mediterranean region. In its natural distribution this species was originally confined to Italy south of the Alps, including most of its islands and Malta (Alzona, 1971; Giusti *et al.*, 1995). However, wherever the Greeks or Romans have left their footprints along the shores of the Mediterranean one may come across isolated populations of this species. It has attracted therefore not only the interest of the zoologist in general and the malacologist in particular, but also that of the archaeologist.

In the last few years attention has been paid to cases of the anthropochorous dispersal of *Papillifera bidens* in Turkey (Gümüş, 2006; Örstan, 2006; Mienis and Gümüş, 2007), Greece (Mienis and Gümüş, 2007), Spain (Mienis and Gümüş, 2007), Gibraltar (Menez, 2007) and North Africa (Ridout-Sharpe, 2008; Mienis and Gümüş, 2009). Its introduction into England (Ridout-Sharpe, 2005, 2007) dates back to the end of the 19th century.

We have now made an attempt to summarise the published records of *Papillifera bidens* along the east coast of the Adriatic Sea from Slovenia in the north to Albania in the south. We have also studied several unpublished samples in the Mollusc Collections of the Hebrew University of Jerusalem (HUJ) and the Zoological Museum of Amsterdam (ZMA), and data received from samples in the private collection of Wim J.M. Maassen (WM). The results are here arranged from north to south along the Adriatic coast:

Croatia

Istria (Jaeckel, Klemm and Meise, 1958: 155) [once this geographical term also included small parts of Italy and Slovenia, therefore it is not clear that the authors referred to the Croatian part of Istria, V. Štamol, in litt.]; Motovun, leg. Maassen (WM); Poreč, leg. Maassen (ZMA and WM); Rovinj (Wagner, 1939:100); Pula, colosseum, leg. Maassen (WM); Dalmatia, ex-coll. R.T. Maitland (ZMA); idem, leg. Ir. Schelling (ZMA); idem (Jaeckel, Klemm and Meise, 1958: 155); Rijeka (Grube, 1861; Brusina, 1870: 22; but Hirc, 1881 looked in vain for it); idem (Mildner, 1982: 50); Krk Island, 1 km south of Omišalj, leg. Maassen (WM); Cres Island, Osor (Štamol and Velkovrh, 1995: 229); Lošinj Island, Mali Lošinj (Frank, 1991: 362); Split, ex-coll. Tomlin/Peile/Blok (HUJ 51184/9); idem (Brusina, 1907: 104); Makarska, leg. Maassen (WM); idem, on Mount Biokovo, ex-coll. Tomlin/Peile/Blok (HUJ 51187/12); idem (Nordsieck, 202: 28); Vis Island (Brusina, 1866: 115); idem, on beach rocks near Milna (Reischütz and Reischütz, 1999: 37); Hvar (Boettger, 1880: 111; Braun, 1887: 110); idem, on the walls of the monastery (Köhler, 1912: 82); Korčula Island, ex-coll. van Heukelom (ZMA); idem, on the tower of Korčula, leg. A. Fuchs (ZMA); idem (Brusina, 1866: 115); idem, Korčula (Brusina, 1907: 102); idem, surroundings

of the town of Korčula (Haas, 1930: 135); idem, on the walls around the town of Korčula (Reischütz *et al*., 2002: 54); idem, Korčula town, leg. Maassen (WM); Sušak Island (Lorenz, 1859: 93; Hirc, 1914: 10; Štamol and Poje, 1998: 110); Pelješac Peninsula, citadel of Ston, leg. Maassen (WM); idem, Orebić, in rock fissures on the mountain, and on walls and under stones in the village (Maassen, 1979a, 1979b); Mljet Island, the harbour of Polače (Reischütz and Reischütz, 2000); Lopud Island, leg. Maassen (WM); Gruž [now part of Dubrovnik], remarkably small specimens (Köhler, 1912: 83); Minčeta [now part of Dubrovnik] (Brusina, 1907: 101); Dubrovnik (Brusina, 1866: 115; Boettger, 1880: 111; Clessin, 1887: 58); idem, leg. Maassen (WM); idem, in the Old City, in the yard of an old house adjacent to the town wall near the sea, very small specimens, leg. Kolodny (HUJ 52400); idem, on the town walls of Dubrovnik (Jaeckel and Meise, 1956: 25); Pridvorje (Boettger, 1880: 111).

Montenegro
Montenegro (Wohlberedt, 1914: 84; Jaeckel, Klemm and Meise, 1958: 155); Herceg-Novi (Brusina, 1907: 102); Kotor (Brusina, 1866: 115); Bar, ex-coll. Trechmann/Peile/Blok (HUJ 51181).

Albania
Albania (Jaeckel, Klemm and Meise, 1958: 155); Shkodër (Dhora and Welter-Schultes, 1996: 136); Durrës (Dhora and Welter-Schultes, 1996: 136); Vlorë (Dhora and Welter-Schultes, 1996: 136); Sarandë, on a dry wall of the old castle (Jaeckel and Schmidt, 1961: 66); idem, south of the village (Dhora and Welter-Schultes, 1996: 136).

We do not rule out the possibility that *Papillifera bidens* may also occur in the coastal areas of Slovenia and Bosnia-Herzegovina; however, so far we have not seen any samples from these regions, nor did we come across any literature records.

Discussion
A number of the terrestrial snails that occur in the coastal areas of countries bordering the Mediterranean Sea show an almost circum-Mediterranean distribution. To this group of snails belong, for example, *Caracollina lenticula* (Michaud, 1831), *Cochlicella acuta* (Müller, 1774), *Prietocella barbara* [= *Cochlicella barbara*] (Linnaeus, 1758), *Microxeromagna armillata* (Lowe, 1852), *Theba pisana* (Müller, 1774), *Eobania vermiculata* (Müller, 1774) and *Cornu aspersum* (Müller, 1774). There are also species which exhibit an almost similar distribution pattern but on closer view these species seem to be restricted to built-up areas, more precisely to regions where in antiquity the Greeks or the Romans had a foothold. A good example of such a pseudo-circum-Mediterranean distribution is provided by *Papillifera bidens.* Its original distribution was restricted to the mainland of Italy south of the Alps and the off-lying islands, and Malta. Whether the natural range of distribution included Corsica is still a matter for discussion. All other localities on the shores around the Mediterranean Sea where this species occurs are probably examples of anthropochorous dispersal. The question arises whether the presence of *Papillifera bidens* along the shores of the eastern Adriatic Sea is natural or falls within the category of ancient introductions.

Our correspondent Wim Maassen wrote the following about this subject: “Personally I have the opinion that *Papillifera* does not belong in former Yugoslavia” (letter dated 19.10.2009), but in another letter (11.11.2009) he wrote: “Some land snails have been found on the islands off the Dalmatian coast, which are otherwise only known from records in Italy, therefore it is possible that some of the localities of *Papillifera bidens* might represent natural populations.” As an example of such a pattern of distribution he mentioned *Acicula disjuncta* Boeters, Gittenberger & Subai, 1989.

The records of *Papillifera bidens* along the eastern Adriatic Sea are not only situated in the original Roman province of Dalmatia, which stretched from Istria in the north to historical Albania in the south, but are located in or near built-up areas, often in the neighbourhood of ancient ruins, old town walls, and the like. Besides the current local names, these towns and villages often also have an ancient Greek, Roman or Italian name. In Table 1 we provide a list of these old names and whether Hellenistic, Roman or Medieval remains are to be found in these localities.

Table 1: Localities of *Papillifera bidens* along the east coast of the Adriatic Sea, their modern and alternative names and the presence of ruins which point to the presence of ancient Hellenistic, Roman or Medieval settlements (according to information derived from the website http://en.wikipedia.org)

Croatia	**Alternative names**	**Archaeological remains**
Motovun	Montona	Roman, but mainly Medieval
Poreč	Parenthos, Parenzo	Roman
Rovinj	Ruginium, Ruvinium, Rovigno	Roman
Pula	Pola, Pulj	Roman
Rijeka	Rika, Reka, Fiume	Roman
Krk-Omišalj	Fulfinium, Muscho, Moschau	Roman
Cres-Osor	Apsoros, Ossero	Roman
Lošinj-Mali Lošinj	Lussinpiccolo	Medieval
Split	Aspálathos, Spalata, Spalato	Hellenistic, Roman
Makarska	Inaronia, Muccurum, Mokro	Roman
Vis	Issa, Lissa	Roman, Greek
Hvar	Pharos, Pharina, Lesina	Hellenistic, Roman
Korčula	Corcyra, Krkar, Curzola	Hellenistic, Roman
Sušak	Sansagus, Sansego	Hellenistic, Roman
Pelješac-Ston		Medieval
Pelješac-Orebić	Sabioncello	Roman (?)
Mljet-Polače		Roman
Lopud		No information
Gruž	Gravosa	No information
Minčeta		Medieval
Dubrovnik		Hellenistic (?), Byzantine
Pridvorje	Prodworje	Medieval
Montenegro		
Herceg-Novi	Castelnuovo, Meljine	Medieval
Kotor	Cattaro	Roman
Bar	Antivari	Roman
Albania		
Shkodër	Scutari	Roman
Durrës		Roman
Vlorë	Valona	Hellenistic, Roman
Sarandë	Bothrata, Butrinti, Butrint	Hellenistic, Roman

According to the data presented in Table 1, most of the localities where populations of *Papillifera bidens* have been found so far were established by the Greeks or Romans. Even the villages, which date back to Medieval times, had strong connections with Italy. Therefore

we are quite convinced that most, if not all, populations of *Papillifera bidens* along the eastern Adriatic Sea coast have to be considered allochthonous ones, *i.e.* they reached the site by means of hitchhiking on material, for example marble, brought over from Italy.

Interestingly, all the specimens which we could study personally belonged to the nominal subspecies *Papillifera bidens bidens*. We noticed a similar situation in material from populations in Greece and Turkey. Along the coast of North Africa we encountered both the nominal subspecies and *Papillifera bidens affinis* (Philippi, 1836), while all the Spanish specimens showed the characteristics of the Sicilian subspecies *affinis*, in which the axial ribs are much more developed. In France both subspecies seem to occur (Falkner *et al.*, 2002); however, nowhere they are found together at a single locality.

Acknowledgements
We would like to thank our colleagues Robert G. Moolenbeek (Zoological Museum of Amsterdam) for giving access to the mollusc collection and the malacological library, Wim Maassen (Naturalis, Leiden) for information about specific samples in his private collection, Dr Vesna Štamol (Croatian Natural History Museum, Zagreb) for numerous additional bibliographic references and Oren Kolodny, M.Sc. student at the Hebrew University of Jerusalem, for donating Croatian land snails to the HUJ Mollusc Collection.

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A brief note on the molluscs from a Chalcolithic site in Yehud, Israel

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A salvage excavation in Yehud, Israel (Permit A-4533) was carried out by I. Milevski (Israel Antiquities Authority) during July-September 2005. The excavation took place in the centre of the town at one of the corners of the junction of Zvi Yishay and Yoseftal Streets. Probes were taken in four areas but only in area C were two shells encountered and preserved for further study.

The two shells were identified as *Glycymeris insubrica* (Brocchi, 1814). Both had smoothed inner edges; this might have been caused by either human modification or natural abrasion. The umbo was broken in one valve, possibly as the result of an attempt to drill a hole in it. The other valve was complete.

Glycymeris insubrica is a bivalve species from the Mediterranean Sea. Once it was a very common species off the coast of the Levant, but today it is considered rare in the eastern Mediterranean where living specimens are collected only occasionally (Mienis *et al*., 2006). The millions of empty valves on the beaches of Israel are silent witnesses to the common occurrence of this species during historic times (Bar-Yosef Mayer, 2005; Sivan *et al*., 2006).

The valves found in area C date back to the Chalcolithic period, according to the additional finds in that area (Milevski, 2008). *Glycymeris insubrica* has previously been reported from the Middle Bronze II, Iron II/Persian and Late Byzantine periods from another excavation in Yehud (Mienis, 2008).

Acknowledgements
I would like to thank Ianir Milevski (Israel Antiquities Authority) and Dr Liora Kolska Horwitz (Jerusalem) for entrusting me with the discussed material.

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A look behind the scenes at how an ivory fragment turned into part of a Spider Conch

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Dr Ze'ev Meshel (Institute of Archaeology) carried out an excavation at Kuntillet 'Ajrud, an Iron Age II site in north-east Sinai, Egypt, during three seasons in 1975-1976. The zoological remains recovered during the excavation were initially studied by the late Dr Shlomo Hellwing (1927-1992). A rectangular object found in locus 90 was identified by him as an ivory fragment. Part of the zoological assemblage was re-examined recently by a team consisting of Dr Liora Kolska Horwitz (vertebrates, except fishes), Dr Omri Lernau (fishes) and the author (molluscs), in order to prepare a chapter for the forthcoming book edited by Meshel: *Kuntillet 'Ajrud – an Iron Age way-side religious center in Sinai*. Unfortunately not all the material seen by Hellwing could be restudied. However, the so-called ivory object was examined again by Horwitz, who reached the conclusion that it was certainly not made of ivory or bone but more likely of shell.

My own study of the object confirmed her assumption: it is a fragment of a very thick shelled mollusc of recent origin. The slightly curved object has a more or less rectangular form. Its measurements are 56.31 x 24.34 mm (length x height) and it is 12.34 mm thick. The natural texture of both the upper- and underside is highly polished; the slightly concave underside shows two faint rims. A cross section of the fragment reveals five layers: thin upper and lower layers, *i.e.* the polished layer on both sides, and three thick layers in which the crystals are orientated in a different direction in each layer. The whole fragment is of a cream colour. It is not a natural broken part of a shell, but one which has been manipulated by man.

Kuntillet 'Ajrud is situated at a distance of 125 km from the Mediterranean Sea and 87.5 km from the Gulf of Aqaba. Molluscs with such heavy shells are not known to occur in the Mediterranean Sea; however, they are quite commonly encountered in the Red Sea in the form of either Giant Clams belonging to the genus *Tridacna* or Seba's Spider Conch, *Lambis truncata sebae.* For illustrations of such shells I refer to Sharabati (1984).

A comparison between the fragment and the three species of *Tridacna* known to live in the Gulf of Aqaba (Richter *et al*., 2008) showed that all these species have a very rough outer surface adorned with scales, a smooth but never polished interior, and the colour may be described as shades of white.

Seba's Spider Conch is a large gastropod of which the shell consists of several whorls and a very large flaring outer lip, which is ornamented with seven digitations. The exterior of the shell is rough and provided with well developed spiral ribs; the interior is highly polished and of a cream colour.

The morphology of none of the *Tridacna* species fits the description of the fragment from Kuntillet 'Ajrud; that of a complete *Lambis* shell agrees only in part, *i.e.* the highly polished interior and colour. Therefore a recent specimen of a Spider Conch was destroyed in order to have a look at the internal whorls, which were expected to be highly polished on both sides. This turned out to be indeed the case. The lower part of the internal columella is highly polished on both sides, the base of it shows two faint ribs on the concave side, the shell is a pale cream colour, it has the same thickness as the fragment, and the cross-section also clearly shows five different layers. In other words, the mysterious ivory fragment of Hellwing is an artefact made of the internal lower part of the columella of Seba's Spider Conch, *Lambis truncata sebae*, a common shallow water gastropod living in the Red Sea.

Although the origin of the material has now been solved, one mystery still remains: what was the possible purpose of this shell artefact?

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[Continued...]

A record of *Rumina saharica* from an excavation in Yafo, Israel

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The Dwarf Decollate Snail *Rumina saharica* (Pallary, 1901), Family Subulinidae, is considered an ancient introduction in Israel (Mienis, 1976). An extensive population has existed since Hellenistic-Roman times within the ruins of Apollonia (= Tel Arshaf), according to the numerous empty shells scattered around all over the place. The last living snails were collected at that archaeological site by the late Dr Hermann Zinner, a herpetologist, during heavy rains in the winter of 1969 (Mienis, 1979, 1991).

Another locality for *Rumina saharica*, where it is now extinct, is the vicinity of Caesarea. Whereas this snail remained restricted to the once built-up area of Apollonia, near Caesarea it became more widely distributed and empty shells can still be found here-and-there in the arable fields south and east of that ancient site.

Both Apollonia and Caesarea are situated along Israel's Mediterranean coast. Elsewhere single empty shells are found occasionally on the beach, not only south and north of both sites but also much further away: Gesher HaZiv, Shiqmona, Akhziv, Netanya and Tel Aviv (Mienis, 1979, 1980; Singer and Mienis, 1992). It is not clear whether these specimens represent undiscovered colonies at other ancient coastal sites or if they arrived from elsewhere in the eastern Mediterranean.

Recent excavations in the Ganor Compound at Yafo (= Jaffa), carried out by Martin Peilstöcker of Israel Antiquities Authorities and Aaron Burke of the Jaffa Cultural Heritage Project, have resulted in the preservation for further study of some archaeomalacological material. These shells are currently being studied by Mrs Inbar Ktalav, who in turn consulted the author concerning the identity of some problematic species. To my surprise, several specimens of *Rumina saharica* were among the material.

At the Ganor Compound, settlement phases were encountered from the Persian, Hellenistic, Roman, Byzantine, Early Islamic, Crusader, Ottoman and British Mandate periods (Burke and Burke, 2008). Since *Rumina saharica* is subterranean for part of its life, it can move easily from one archaeological level to another. Therefore nothing can be said with certainty about the age of these shells. However, Yafo constitutes the third ancient site where the exotic Dwarf Decollate Snail was once living in modern Israel.

It is noteworthy to record that a few years ago a living colony of *Rumina saharica* was discovered in Ramat Aviv, a suburb of Tel Aviv-Yafo (Mienis, 2003), where it seems to occur quite abundantly in several gardens. No remains of an ancient site are known to occur in this neighbourhood.

Acknowledgement
I would like to thank Mrs Inbar Ktalav (Kibbutz Hannaton) for showing me the archaeomalacological material from Yafo.

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Book Review

Land and people: papers in memory of John G. Evans **(edited by Michael J. Allen, Niall Sharples and Terry O'Connor). Oxford, Oxbow Books. (Prehistoric Society Research Paper, 2.) xxii + 236 pp.**

Land and people: papers in memory of John G. Evans was published by the Prehistoric Society and Oxbow Books in partnership with the Conchological Society of Great Britain and Ireland on 3 September 2009. The book was launched at the 30th Anniversary Conference of the Association for Environmental Archaeology in York on 3-5 September 2009.

This volume is dedicated to John Evans (1941-2005) in celebration of his contribution to conchology and environmental archaeology. John was the leading proponent of land snail analysis in archaeology having published his seminal book *Land Snails in Archaeology* in 1972 and an appreciation of him was published in *Journal of Conchology* (2006), 39 (1): 111-117 [and in the AMG Newsletter, No. 8 (September 2005): 5-6]. Indeed, one of the last public meetings he attended was a Conchological Society meeting in February 2005 when the lecture was on 'Molluscs in Archaeology' by Mike Allen. This new book covers many aspects of the research he engaged in during his career; typically a number of papers relate to land snails and marine shells, but a series of other aspects of prehistoric environmental archaeology and ideas of texture and social order are considered. Two papers provide key discourses in significantly developing and revising John's work on the chalkland.

Papers by Paul Davies and Neville Gardner, and Mark Robinson examine land snails in particular, with Paul and Neville discussing the nature of modern recording and ecology of woodland and Mark examining the palaeoecology of *Ena montana.* Palaeoecological sequences of land snails are discussed from Roman colluvium at Rock Roman villa on the Isle of Wight by George Speller, Richard Preece and Simon Parfitt, and from sediment cores from mire in Orkney by Terry O'Connor and Jane Bunting. Data derived from land snail evidence provide the basis of arguments for prehistoric land-use of the chalklands of southern England by Mike Allen and Julie Gardiner, and to a lesser extent by Charles French. Land snails were also used in some of the preliminary work examining the prehistory of the Wylye valley, Wiltshire (Gardiner and Allen).

Marine shells, in the form of prehistoric middens, are discussed to examine continuity and change in the Mesolithic/Neolithic of the west coast of Scotland, by Nicky Milner and Oliver Craig. Their study included isotope and radiocarbon analysis of the shells.

These and other chapters cover geographical, methodological and thematic areas that were of interest to, and had been studied by, John Evans. In some instances papers have been inspired by John's approaches to landscape and landscape analysis and their application to new or wider areas than John himself studied in detail. Others take forward, re-examine or elaborate

on some of his specific theories and interpretations, looking at new or improved datasets. As a collection, the papers in this volume provide a diverse and cohesive picture of how archaeological landscapes are viewed within current research frameworks and approaches, while also paying tribute to the innovative and inspirational work of one of the leading protagonists of environmental archaeology and the holistic approach to landscape interpretation.

Contributors: Michael J. Allen, Martin Bell, M. Jane Bunting, Oliver E. Craig, Paul Davies, Jane Downes, Andrew Fleming, Charles French, Julie Gardiner, Neville Gardner, Frances Healy, Richard Jones, Steve Mills, Nicky Milner, Jacqueline A. Nowakowski, Terry O'Connor, Simon A. Parfitt, Aikaterini K. Paschali, Richard C. Preece, Mark Robinson, Niall Sharples, George R. Speller and Alasdair Whittle.

Full details and order forms can be downloaded from the website of the Conchological Society of Great Britain and Ireland (www.conchsoc.org) or the Prehistoric Society website at (www.prehistoricsociety.org). **(Mike Allen)**

Charonia lampas lampas L.: from shell to musical instrument

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Summary
Experimentation has shown that it is possible to use a *Charonia lampas lampas* shell naturally damaged by marine action at the level of the first whorls as a musical or sounding instrument. The irregularity of the broken edge would need to have been smoothed by abrasion and the columella perforated. The artificial transformation of a complete specimen, by cutting it short at the level of the first whorls with the aid of a flint blade and then perforating the columella with a flint point, is equally possible.

Introduction
Charonia lampas lampas Linnaeus, 1758 (syn. *C. nodifera* Lamarck, 1822), the 'knobbed triton', is a marine gastropod of the family Ranellidae. It can reach as much as 40 cm in length. According to age, it has seven to eight whorls.

It exists as a Pliocene fossil (Fontannes, 1879-1882) in south-east France and lives today in the western Mediterranean and on the Atlantic coast from the Azores to the English Channel. Entire specimens of large size have been used in the past as containers (Karali, 1999), shell fragments have been perforated to make pendants (Moinat, 2007) and the body whorl has been used as a bracelet (Mariéthoz, 2007). The idea of using it as a simple sounding instrument and then as a musical instrument appears to have started in the Palaeolithic. The example from the Aurignacian level in the Marsoulas Cave in Haute-Garonne, France (Bégouen *et al*., 1933) had been envisaged as a container for drinking from because the opening at the apex has been polished from use. A new study of this piece revealed that it had almost certainly been exploited as a sounding or musical instrument because the break is situated in exactly the right place to produce a sound when the shell is blown.

The experimental transformation of this species of marine shell into a sounding instrument was been calculated from the study of archaeological and ethnological shell trumpets.

Removal of the first whorls

Empty *Charonia lampas lampas* shells thrown up on beaches often show wear and fractures caused by the sea having rolled them against sandy or rocky substrates. These shells are subject in particular to breakage of the apex at different levels of the first whorls. The edge of this break is discontinuous and can be rough or smooth, according to the specimen.

From these general observations, it was investigated whether it is possible to distinguish between a natural irregular fracture between two whorls of the apex and a deliberate fracture caused by percussion, which results in a similar broken edge (Deramaix, 1992), in order to identify artificially modified archaeological specimens. However, it has not been possible to experiment with entire shells having the same biometric characteristics as archaeological examples, due to their lack of availability.

The method employed by one of us (JMS) using an entire shell was that of sawing between the fifth and sixth whorls using two flint tools. The work commenced by cutting a regular and shallow circular groove around the circumference of the shell using a small flint flake. This preliminary operation avoided the production of a helicoidal groove. The sawing was then resumed with the aid of a larger and more robust flint flake. The experiment was repeated twice and it was demonstrated that the shells could be sawn easily and very precisely using this method, which left some rough patches on the edge of the made opening. JMS has previously used this method to remove the epiphyses from the ends of bird long bones, including the ulna of a vulture, in order to make flutes.

A different procedure would consist of sawing the shell between two whorls with the aid of a string impregnated with sand.

Preparation of the mouthpiece

It was shown that the shell is able to function as a sounding instrument as soon as the apex has been removed, whether naturally or artificially. However, it is desirable that the broken edge of the shell should first be rubbed with an abrasive stone to smooth down the mouthpiece, which can then be polished with damp leather impregnated with fine sand to remove any remaining rough patches. In an experiment, JMS rubbed down the mouthpiece with a piece of fine-grained sandstone and then polished it with the hairy side of a piece of animal skin. The repeated contact of the lips against the mouthpiece eventually creates a shiny surface.

The instrument

Each perforated shell will emit a particular sound when blown, as a function of the size of the shell and its manipulation by the user. When used as a sounding instrument, the shell could give an alarm or warning for different purposes.

The *Charonia* shells recovered from the cave of Arene Candide in Italy, which range in size from 9.1 to 19.0 cm long, are considered to have been musical instruments (Cortese *et al*., 2004). The sound emitted by each shell was given the equivalent of a precise musical note. From sound to music: with practice it has been found possible to modulate the sound emitted by a shell in order to produce some simple chants.

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This article is a translation (by JRS) of:
Pauc, P. and Strangi, J.-M., 2009. *Charonia lampas lampas* L.: du coquillage à l'instrument sonore. In: Dumas, C. (ed.), *Langage de pierre: la restitution du geste en préhistoire. Colloque européen, Baux de Provence, octobre 2009.* Musée des Baux, Maison Cazenave. pp. 40-42.

The French text of this and other related articles can be read on Paulette Pauc's blogsite at http://art-archeologie.over-blog.fr.

ABSTRACTS

d'Errico, F., Vanhaeren, M., Barton, N., Bouzouggar, A., Mienis, H., Richter, D., Hublin, J.-J., McPherron, S.P. and Lozouet, P., 2009. Additional evidence on the use of personal ornaments in the Middle Paleolithic of North Africa. *Proceedings of the National Academy of Sciences of the United States of America*, 106 (38): 16051-16056, with supporting information online at www.pnas.org/cgi/content/full/0903532106/DCSupplemental.
ABSTRACT: A previous claim for the 82,000-year-old use of shell beads in North Africa and its implications for the origins of modern human behaviour [see AMG Newsletter, No.13:10 for citation] has been criticised because of the low numbers of recovered shells, the lack of secure dating evidence and the fact that the documented examples had not been deliberately shaped. This paper reports on 25 additional *Nassarius* shell beads from four Moroccan Middle Palaeolithic cave sites: Taforalt (Grotte des Pigeons), Rhafas, Ifri n'Ammar and Contrebandiers. Comparative analyses of modern, fossil and archaeological assemblages and the microscopic examination of the Moroccan material have led to the conclusion that *Nassarius* shells were consistently used for personal ornamentation in this region at the end of the last interglacial. Shells with a perforation on the dorsal side appear to have been deliberately collected and/or perforated by humans; marks and striations on some of the shells are consistent with attempts to perforate them using a lithic point, and their microwear pattern suggests that they had been strung as beads. It is postulated that climatic changes may have resulted in the disappearance of this distinctive feature of symbolic behaviour before its reinvention 40,000 years ago. (JRS)

Kurzawska, A., Bar-Yosef Mayer, D.E. and Mienis, H.K., 2009. Scaphopod shells in the Natufian culture. Conference paper presented at: *The Natufian culture in the Levant II*, Institut National d'Histoire de l'Art, Paris, France, 7-11 September 2009.
ABSTRACT: Scaphopod shells, which predominate in shell assemblages, are considered to be one of the characteristics of the Natufian culture. Previous studies of the shells determined that they were obtained from three different sources: the Mediterranean, the Red Sea, and Pliocene formations. The current research was focused on a detailed analysis of scaphopod shells from assemblages of Late Pleistocene/Early Holocene sites in Israel: Urkan e-Rub IIa

(Kebaran), Hayonim Cave, Eynan, Hilazon Tachtit Cave and Raqefet Cave (Natufian), Gilgal (Final Natufian and PPNA) and Ramat Harif (GVIII) (Harifian). Eleven different species were identified, belonging to three families: Fustiariidae, Dentaliidae and Laevidentaliidae. The majority of shells originated in the Mediterranean and belong to *Antalis vulgaris* and the "*Antalis dentalis* group" and were probably the most easily accessible scaphopods in the Late Epipalaeolithic period. Red Sea shells mostly belong to the "*Dentalium reevei* complex". Most of the scaphopods differ in shell features from present-day specimens, which suggests changes in ecological and climatic conditions, a topic that requires further study. All scaphopods were collected as empty shells. Most of the beads were made of the middle segments of scaphopod shells as these are the most suitable for stringing. Apical segments are usually considered as waste products since their holes seem to be too small to be threaded. The differences in state of preservation are probably a result of the variability in shell structure that characterises each of the species, the size of the beads and their resistance to particular taphonomic processes in specific sites. Prehistoric humans apparently chose specific species to be used as beads, differentiated between certain types of scaphopod shells, and used them separately in burials (in the sites of Hayonim Cave, Hilazon Tachtit Cave and Eynan). Detailed taxonomic observations along with in-depth study of the archaeological context will enhance our understanding of the role scaphopod shells played in prehistoric societies in the Levant. (Authors' summary)

Spiro, B., Ashkenazi, S., Mienis, H.K., Melamed, Y., Feibel, C., Delgado, A. and Starinsky, A., 2009. Climate variability in the Upper Jordan Valley around 0.78 Ma, inferences from time-series stable isotopes of Viviparidae, supported by mollusc and plant palaeoecology. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 282: 32-44.
ABSTRACT: Early-Middle Pleistocene lacustrine sediments at Gesher Benot Ya'aqov in the northern Jordan Valley, Israel, provide an environmental record of a lakeside habitat over some 100,000 years. The 34-m thick sequence consists of six sedimentary cycles, the first of which precedes the Matuyama-Brunhes Boundary (MBB) at 780,000 years ago. The absence of Viviparidae below the MBB is attributed to a cooler climate, whereas the appearance of viviparids of African and/or Asian origin in cycle 2 marks an increase in water level and temperatures reflecting a warm and humid climate. The time series of $\delta^{18}O$ and $\delta^{13}C$ in the large-shelled and long-lived *Viviparus apameae galileae* and *Bellamya* sp. from cycles 2 to 5 provide a record of seasonal and annual fluctuations in environmental conditions and suggest that above the MBB the lake received a constant and isotopically consistent water inflow. Floral, molluscan and ostracod assemblages throughout the sequence support a trend of climate warming at the MBB and more moderate changes subsequently. The MBB, which marks a reversal in magnetic polarity, coincides with a significant environmental change in this region which may be linked with an increase in hominin activity. (JRS)

Conference Diary

All at sea? Synergies between past and present coastal processes and ecology, Loughborough, UK, 22-23 April 2010
Coastal zones are constantly evolving high-energy environments which exhibit rapid spatial and temporal change and have been seriously altered by human impact. Major anthropogenic changes make it increasingly difficult to understand the already complex natural physical processes and ecological changes operating within the coastal zone, and these issues must be resolved before palaeorecords can be effectively used for interpreting the past. This meeting, to be held in the Geography Department at Loughborough University, UK, will include four sessions: (1) The contemporary coastal zone: physical, biological and chemical impacts on ecology; (2) Assessment of the strength of climatic and environmental change: inferences

from palaeoecological investigations; (3) Formation of the palaeorecord in high-energy environments: chronology, taphonomy and diagenesis; (4) Integrating contemporary and palaeo datasets from the coastal zone: synthesis and visions for the future. For more details, please see: http://www.lboro.ac.uk/departments/gy/allatsea/home.html.

Conference of European Quaternary Malacologists, Szeged, Hungary, 15-18 August 2010

EQMAL 2010 will focus on different aspects of Quaternary environments and stratigraphy, as well as archaeozoological research related to molluscs. For further information, please see: http://eqmal2010.blogspot.com/.

International Council for Archaeozoology, Paris, 23-28 August 2010

A reminder that the ICAZ 2010 conference will include a full-day archaeomalacology session, subject to sufficient submissions. Hopefully, there will be three subsessions within this session: (1) Worked shell; (2) Shell middens; (3) Shells from a palaeoenvironmental and taphonomic perspective. For more information, please see AMG Newsletter, No.15: 16 and http://triton.anu.edu.au/Paris 2010 Conference.htm

Mesolithic in Europe Conference, Santander, Spain, 13-17 September 2010

The MESO 2010 conference, to be held at the Universidade de Cantabria, Santander, Spain, will include a session entitled 'Gastropods and humans in the Late Palaeolithic and Mesolithic of Europe and the circum-Mediterranean', organised by David Lubell (dlubell@uwaterloo.ca) and Nick Barton (nick.barton@arch.ox.ac.uk). Gastropods are a major component in several Late Pleistocene and numerous Early to Middle Holocene archaeological sites throughout Europe and the Mediterranean region. Land snails are most common, but marine and freshwater species also occur. This session will explore the significance of gastropods to humans in this region, not only as food but also for decorative, ceremonial and other purposes. It is hoped to address some specific questions, such as whether gastropods represent starvation food or evidence for feasting, whether their biology and ecology may have been a factor in their use by humans, and what their nutritional contribution to prehistoric diets might have been.