THE ARCHAEO+MALACOLOGY GROUP NEWSLETTER
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Editorial

The three lead articles in this issue of the AMG Newsletter all invite comments and contributions from readers. Does anyone know of other instances where dog whelks (*Nucella lapillus*) have been used to produce purple dye in northwest Europe, and can this be a plausible explanation for the accumulations of dog whelk shells seen in some Romano-British period sites in southwest Britain? Can anyone help Fotis Ifantidis compile an archive of illustrations of notched *Spondylus gaederopus* from the European Neolithic? And has anyone else found *Papillifera papillorum* in sites removed from its Italian homeland, where it might have been transported on marble in antiquity?

Other items in this newsletter include a brief recognition of the work of Nick Shackleton, who has recently died, and following on from this another case where molluscs have been used to date Pleistocene deposits. Returning to the ancient Near East, abstracts are given of three further reports by Henk Mienis on molluscan assemblages from Israeli sites. This issue also contains reviews of two important new publications.

As always, I would like to thank all the contributors to this newsletter for their support, and to encourage everyone to submit short articles, comments, publications for abstracting, book reviews, anything archaeomalacological, for the next issue. The future of the newsletter depends on your contributions, so please keep them coming in.

Thanks are due, once again, to Kath Szabo of the ICAZ Archaeomalacology Working Group and to Aydin Orstan for posting this newsletter on their websites: http://triton.anu.edu.au/ and http://home.earthlink.net/~aydinslibrary/AMGnews.htm, respectively. The next issue, number 10, will hopefully appear at the end of September 2006. (JRS)

Whelks and purple dye in Anglo-Saxon England

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The Anglo-Saxon scholar known as the Venerable Bede completed his *Ecclesiasiastical History of the English People* in 731 AD. In reviewing the natural resources of Britain in his introduction, he writes that British whelks produce a beautiful dye which does not fade from sun or rain, and grows even more beautiful with age (Colgrave and Mynors, 1991). In a period long before the development of synthetic dyes, these qualities were rare and highly prized.

Many people have heard of Imperial Purple, the whelk-dyed cloth associated with the Emperors of Rome and Byzantium. Considerable research has been carried out in Israel in recent years to identify the molluscs involved in the famous purple-dyeing industry of the ancient Near East, and it is currently believed that the spiny dye-murex (*Bolinus brandaris* Linnaeus, 1758), the banded dye-murex (*Hexaplex trunculus* Linnaeus, 1758) and the rock-shell (*Stramonita haemastoma* Linnaeus, 1758) provided the red-purple and violet colours that the Ancient World valued so highly (Ziderman, 1986).

Fabric or fibres for weaving can be dyed directly from the opened whelk, and this simple process can still be observed in Mexico, for example (Thompson, 1995). When the colourless mucus from the hypobranchial gland of the animal reacts with air and sunlight, it passes through a succession of colour changes, usually from yellow to green to blue to purple, and the final colour is fast. The ancient dyers, however, used a vat process which has left millions of broken shells on the beaches of modern Lebanon and Israel; this process was described by Pliny the Elder in his *Historia naturalis*, written in the 1st century AD.

But what about northwestern Europe? Modern experimenters have found that dog-whelks (*Nucella lapillus* Linnaeus, 1758) also produce red-purple and violet colours. Furthermore, in Ireland, on the island of Inishkea North, Co. Mayo, archaeologists found a whelk-dyeing workshop, dated to the 7th century AD, complete with a small, presumed vat, and a pile of broken-open dog-whelk shells (Henry, 1952). Unfortunately, no such workshop is known from Britain for the Early Medieval period. However, a double-checked trace of bromine, indicating the presence of whelk-dye, has been found on one page of an Anglo-Saxon book known as the *Barberini Gospels* (Porter, Chiari and Cavallo, 2002). This manuscript dates to the late 8th or early 9th century AD, and the whelk dye occurs as a background panel to white lettering at the beginning of St John's gospel. Efforts have also been made to find whelk dye on surviving fragments of Anglo-Saxon textiles, but the chemical analyses so far carried out have proved negative for bromine.

The surviving written records of Anglo-Saxon England (the period from the 5th century to c.1100 AD) are now being studied for any further evidence of the knowledge of whelk dye. Possible examples include an account of the accession ceremony of Aldfrith, a Northumbrian king, which involved whelk-dyed cloth, although this may simply be a poetic echo of Roman ceremonies. Another example involves an account of valuable textiles brought to England by Wilfrid, an 8th-century bishop of Ripon. Thus, archaeological, art-historical and linguistic evidence is currently being researched against a background of malacological studies to elucidate whether the costly whelk-dyed fabrics of the Mediterranean region were imported in this period, and, also, how far Britain may have produced its own purple cloth and parchment.

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Carole Biggam's paper, 'Knowledge of whelk dyes and pigments in Anglo-Saxon England', will be published in the Cambridge journal Anglo-Saxon England *in 2007.*

It is now possible to register for the ICAZ conference to be held in Mexico City on 23-28 August 2006, via the following website:
http://www.alexandriaarchive.org/bonecommons/icaz2006/registration.html

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‘Enigmatic’ notched *Spondylus* ornaments from the Neolithic: new evidence from the Aegean

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The *Spondylus gaederopus* Linnaeus, 1758 artefacts found among European Neolithic communities are well-known in the literature, where they are interpreted as one the earliest expressions of an exchange network in luxury products. Leaving aside the plausible objections to this interpretation, since there is still a lack of serious research in terms of laboratory analyses, in this short article I will present new evidence concerning an aspect of the *Spondylus* ‘phenomenon’: the hook-shaped or ‘notched’ *Spondylus* objects.

The excavations carried out at Dispilio (Hourmouziadis, 2002), the first lakeside Neolithic settlement to be excavated in Greece, have yielded an important and variable assemblage of personal ornaments (Ifantidis, 2004, 2005, 2006; Veropoulidou and Ifantidis, 2006). This comprises almost all the known ‘types’ in the Neolithic Aegean, such as shell annulets; clay, stone, bone and shell pendants; necklaces from beads of many types and also some rather rare or ‘special’ artefacts, such as anthropomorphic pendants, marble bangles, finger rings made of antler, and human teeth as beads and pendants.

At Dispilio a group of eight hook-shaped objects made from shells of the spiny oyster *Spondylus gaederopus* was found and dated to the final stages of the Middle Neolithic period. Seven of them had been manufactured from the right valve of the shell, which is heavier and more compact. On the other hand, the intact artefact (coded K0077) was manufactured from the left valve, on which the natural red colouring is more vividly preserved. Judging from the size of these objects (K0077 is more than 11 cm in length and 140 g in weight) and keeping in mind that they have been extensively worked, we may presume that the shells used were of very large dimensions and probably came from deep water. Furthermore, we can assume the importance of these artefacts to their Neolithic users, since in at least three cases attempts had been made to repair them with perforations.

The only published archaeological parallel from the Neolithic Aegean came from the Alepotrypa Mani Cave and measures 10.2 cm long by 8 cm wide (Karali, 1998: 111; Papathanasopoulos, 1996: 228). A fragment of a possibly similar artefact, probably the lower part, came from the site of Fthiotides Thibes in Thessaly (Theocharis, 1973: 332), and another is known from Franchthi Cave (Miller, 1997: 165; Part II, Illustrations: Fig. 22/FV 429; Shackleton, 1988: 19), probably the upper part that also bears incisions. It is worth mentioning how the first object was interpreted. Papathanasopoulos (1996: 228-9), the excavator of Alepotrypa Cave, rejected its possible function as a belt buckle or fishing implement and noted that: ‘Maybe it is much more correct to assume that objects of this shape are the heads of shepherds’ crooks, that during their constant use symbolize initially the wealthy stock-farmer and later on – through the passage of generations – become ‘scepters’, of no practical use, symbols of prestige, power, political and religious authority’.

Although charming, this interpretation does not take account of several facts. First of all, the ‘scepter’ was found in a problematic and non-excavational context, while traces that could justify fastening of the object to the shaft of a crook are absent. Moreover, the writer appears not to have been well-informed about the similar artefacts found elsewhere in Europe.

I believe that the assemblage of notched and hook-shaped *Spondylus* objects from Dispilio had the ornamental function of belt hooks (meaning the ‘hooks’ of a complex ‘eye-and-hook’ belt buckle). This conclusion is drawn from use/wear analysis (grooves at the inner side of the ‘hook’ suggest the use of threads) and, more importantly, because morphologically similar

artefacts found in Europe have been interpreted as such, mainly because they were found in cemetery contexts near the waist of the deceased.

Hook-shaped *Spondylus* artefacts are known from Neolithic sites in France, Germany, Hungary and Czechoslovakia (Kalicz and Szénászky, 2001; Müller, 1997; Séfèriadès, 1995a, 1995b, 2000; Taborin, 1974; Todorova, 2000; Willms, 1985). These are known in the literature as 'V-Klappe', 'V-notched', 'bi-winged' or 'entaillés' *Spondylus*. Their presence is related to the Linearbandkeramik culture of the end of the Late Neolithic, and Vencl (1959) determined their geographical and temporal distribution from eastern France at the western end of their range to Hungary and the Danube region at the eastern end.

More analytically, 'notched' *Spondylus* have been found in France at the sites of Hoenheim, Merxheim-Breit, Vert-la-Gravelle, Larzicourt and Chaumont (Bonnardin, 2004; Chertier, 1985, 1988; Nieszery 1995: 249; Taborin, 1974: 148-51), in Germany at the site of Körner (Nieszery, 1995: 249), and in Czechoslovakia at the sites of Kadaň, Vejvanovice, Zábrdovice, Přerov-Předmostí and in the cemetery of Nitra (Nieszery, 1995: 249; Pavúk, 1972; Vencl, 1959: 701-4). In addition to these 11 sites, Séfèriadès (1995b) published ten more on a map, without giving their names or further details. It is noteworthy that only a few of these objects have been illustrated and published.

As Michelle Miller (1997: 286) notes, the absence of similar finds in the Aegean, which is the primary source of *Spondylus* shell, is problematic and can only be explained by the possibility that the raw material was procured in Europe from the Aegean and afterwards was locally elaborated into hook-shaped objects. In contrast, Todorova (2000: 416) notes that the find of a 'V-Klappe *Spondylus*' at Dispilio, 'being the southernmost find of this kind', is an indication that all the Linearbandkeramik 'V-Klappe' objects emanated from the Aegean as finished artefacts. (Todorova refers to a notched *Spondylus* object from Dispilio published in a preliminary site report, although the object illustrated is actually parts of two different notched objects.)

To assume that this 'notched' *Spondylus* assemblage is associated with a probable (secondary?) exchange network, parallel to the one of *Spondylus* annulets, is hazardous, mainly because there are insufficient data from the Aegean, the rest of Europe and the Balkans. Also, this hypothesis can only be considered after the simultaneous analysis of the artefacts, something that can be fulfilled only within the framework of an organised research programme. However, the Dispilio assemblage presents new evidence for the discussion of these hook-shaped *Spondylus* objects, which until now have been deemed characteristic only of Central and Western Neolithic Europe. They represent a phenomenon that has been described as 'enigmatic', and one that even has 'mythological' dimensions (see, for example, Séfèriadès, 1995b: 240).

Beyond these hypotheses, and concerning the ornamental and 'aesthetic' function of these artefacts from the Neolithic community of Dispilio, we may readily suppose that these objects created a massive visual impact when worn, due to their impressive size, coloration and even their weight.

In conclusion, I would like to emphasise the need – and simultaneously make a request – for a concerted effort to publish and above all to illustrate these objects. There is always the possibility that this 'enigmatic' phenomenon is simply the result of lack of research and communication between researchers, especially since this 'mystery' involves so many parts of Europe.

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Fotis Ifantidis studied archaeology at the Aristotle University of Thessaloniki and has participated in many prehistoric excavations in northern Greece. He is a member of the excavation team at the Neolithic lakeside settlement of Dispilio, Kastoria, and in 2006 he was awarded an MA in Prehistoric Archaeology for his work on the ornaments from this site. He would like to collaborate with others to create an archive of illustrations of Spondylus gaederopus *notched ornaments. The figures of the* Spondylus *artefacts from Dispilio and a European distribution map for notched* Spondylus *as published in his MA thesis are available at:* http://visualizing-neolithic.blogspot.com/2006/03/illustrations-for-archaeomalacology.html.

The clausiliid snail *Papillifera papillaris* in Istanbul, Turkey

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The homeland of *Papillifera papillaris* (O.F. Müller 1774) is believed to be the Italian Peninsula and nearby islands, including Corsica and Sicily (Falkner, 1990). Humans have inadvertently introduced the species to other places. In the AMG Newsletter No. 7, Janet Ridout Sharpe (2005) gave a record of *P. papillaris* from a house in England that was built in the 19th century. She suspected that the snails had come on a marble balustrade that had been brought from Rome in 1896. This is a useful clue to help explain how this species may have been introduced to other places outside of its homeland.

Since 2000, I have found *P. papillaris* in three places in Istanbul. In each case, the snails were closely associated with buildings of various ages.

- Anadolu Hisari, a 14th century fort on the Asian side of the Bosphorus (Örstan, 2003).
- Along the outside walls of the Armenian monastery on Kinaliada, a small island off Istanbul in the Sea of Marmara.
- Yedikule, the Byzantine-Ottoman fort located at the southwestern corner of the old defensive walls of Constantinople. The beginnings of this fort date to the Golden Gate, the triumphal archway erected during the reign of the Byzantine Emperor Theodosius I (379-395 AD). Subsequently, the gate was incorporated into the walls of the city. After the Ottomans took the city, they added four more towers connected to each other and to the gate by walls, forming a roughly pentagonal structure with a total of seven towers. Hence the name Yedikule, which means 'seven towers'.

Sturany (1902) published the first record of *P. papillaris*, as *P. bidens* (Linnaeus 1758), from Yedikule, based on a collection made in 1900. Loosjes (1963) gave a record of the same species collected in 1959 from the city walls near Yedikule. I collected *P. papillaris* along the walls of the fort in 2000. These records spanning a century indicate that the species is a permanent inhabitant of the location.

Additional records of *P. papillaris* from Istanbul, some dating to the mid-19th century, are published in Bank and Menkhorst (1994).

Considering the close ties the Byzantine Empire had with Rome, I wouldn't hesitate to hypothesise that *P. papillaris* was first brought to Constantinople from Italy probably as early as the time of the rebuilding of the city by the first Byzantine Emperor Constantine around 330 AD, or perhaps even before then when the city was known as Byzantium. As exemplified by the likely transfer route of the snails from Rome to England, the snails were probably introduced to Constantinople on marble or marble objects brought from Italy. Since building materials were routinely reused, once *P. papillaris* was introduced to one or a few locations, the snails were probably gradually distributed throughout the city.

One could presumably prepare a possible chronology of the introduction and distribution of *P. papillaris* in Istanbul using the known or approximate ages of the various buildings where it has so far been found.

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Nicholas Shackleton (1937-2006)

Professor Sir Nicholas John Shackleton was knighted in 1998 for his services to Quaternary palaeoclimatology. He was a pioneer in the use of oxygen isotope ratios as preserved in the shells of fossil molluscs and foraminifera to determine ocean temperatures in the past.

He graduated in physics from Clare College, Cambridge in 1961 and was selected to work with Harry Godwin, then head of the Sub-Department of Quaternary Research, to set up a laboratory to measure stable isotopes. The project was intended to continue the work of Harold Urey, who first demonstrated that the heavy isotope of oxygen (O18) was fractionated from the light isotope (O16) as a function of temperature, and Cesare Emiliani, who used mass spectroscopy on foram shells to identify cycles of warm and cold sea-surface temperatures going back over half a million years. Shackleton developed a more sensitive mass spectroscopy technique as part of his postgraduate work and in 1967 he received his PhD for a dissertation entitled 'The measurement of palaeotemperatures in the Quaternary era'. He remained at Cambridge until he retired as Professor of Quaternary Palaeoclimatology in 2004.

Much of his early work was on molluscs. He contributed a chapter on 'Marine Mollusca in archaeology' for that standard 1970s textbook on environmental archaeology, *Science in archaeology* (second edition, 1969) edited by Don Brothwell and Eric Higgs. In it he describes the potential of sea shells from archaeological sites to supply economic and cultural information, provide a key to the past climate, and contribute to the absolute dating of the site through radiocarbon analysis. He acknowledges Colin Renfrew as his stimulus, and it is noteworthy that around the same time he published a report on the Mollusca and other marine invertebrates as Appendix IX in *Excavations at Saliagos near Antiparos* (1968) which was edited by J.D. Evans and Colin Renfrew. This report, which was published about 40 years ago, paved the way for numerous studies by subsequent authors by its systematic listing of species with descriptions of shell condition, edibility and/or utilization and occurrence at other archaeological sites, and introduced the use of size histograms to compare material from different periods and locations.

However, palaeotemperature reconstruction by oxygen and carbon isotope analysis was Nick Shackleton's great interest, and much of his more recent work was devoted to the generation of long climate records from different ocean regions and ice cores, all of which has contributed greatly to our understanding of ice age periodicity and, indeed, to future climate change. (JRS)

Early man in Britain is dated on shell evidence

Amino acid racemisation was measured in the opercula of fossil freshwater snails found associated with early flint artefacts in a riverine deposit in eastern England, and helped to date this evidence for human occupation of Britain to around 700,000 years ago – some 200,000 years earlier than was previously thought.

Kirsty Penkman of BioArch at the University of York analysed the calcitic opercula of *Bithynia* sp., using a newly-refined technique developed by her colleague Matthew Collins, also

at the University of York. Penkman and Collins are both members of the Ancient Human Occupation of Britain (AHOB) project, which has been studying worked flint discovered two years ago in a cliff at Pakefield, near Lowestoft in Suffolk.

The amino acids were securely contained within calcite crystals in the opercula and so were unaffected by environmental factors other than normal protein degradation. Penkman is quoted as saying: 'Helping to demonstrate the antiquity of the Pakefield site has been very exciting, and we are now trying to apply the same technique to more sites in Britain and overseas'.

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Archaeomalacology in Israel: abstracts of papers received from Henk Mienis

Mienis, H.K., 2005. Appendix 1. Identification of shells. In: Dothan, M. and Ben-Shlomo, D. (eds), *Ashdod VI: the excavations of Areas H and K (1968-1969).* Jerusalem, Israel Antiquities Authority (IAA Reports 24). n.p.

ABSTRACT: An examination of the molluscan material excavated in the 1960s from Areas H and K of this Late Bronze Age site on the Mediterranean coast of Israel recorded the presence of 11 species of marine shells and two freshwater species. Nine of the marine species came from the Mediterranean Sea: *Dentalium inaequicostatum* (n=1), *Bolinus brandaris* (n=3), *Nassarius circumcinctus* (n=14), *Nassarius gibbosulus* (n=1), *Columbella rustica* (n=1), *Conus mediterraneus* (n=1), *Glycymeris insubrica* (n=1), *Spondylus gaederopus* (n=1) and *Acanthocardia tuberculata* (n=2); two were from the Red Sea: *Nerita sanguinolenta* (n=1) and *Cypraea annulus* (n=5). The single *Nassarius gibbosulus* had been pierced to form a bead and one *Acanthocardia tuberculata* is illustrated with a ground and pierced umbo to form a possible pendant. At least one of the *Cypraea annulus* had the dorsum removed. The freshwater species comprised *Theodoxus jordani* (n=23), which had been holed to form beads, and the Nile mussel *Aspatharia rubens* [=*Chambardia rubens arcuata*] (n=1).

Horwitz, L.K., Ben Giora, N., Mienis, H.K. and Lernau, O., 2005. Faunal and malacological remains from the Middle Bronze, Late Bronze and Iron Age levels at Tel Yoqne'am. In: Ben-Tor, A., *et al.* (eds), *Yoqne'am III: the Middle and Late Bronze Ages. Final report of the archaeological excavations (1977-1988).* Jerusalem, Yoqne'am Regional Project (Qedem Reports 7). pp. 395-435.

ABSTRACT: The complex urban site of Tel Yoqne'am represents a succession of occupation phases spanning the Middle Bronze Age IIA to the Crusader periods. The site is situated at the interface of three geographical regions: the coastal plain to the west, Mount Carmel to the north and the Jezreel Valley to the east. The archaeozoological assemblage from Bronze and Iron Age levels included 46 shells and shell fragments from well-dated contexts, which represent ten taxa from three different localities: local terrestrial (*Helix engaddensis*); local freshwater (*Melanopsis buccinoidea, Potamida littoralis delesserti*); and the Mediterranean Sea (*Phalium granulatum undulatum, Charonia variegata, Bolinus brandaris, Stramonita haemastoma, Nassarius gibbosulus, Glycymeris insubrica, Cerastoderma glaucum*). The small size of the shell assemblage is attributed to a lack of sieving and a predominance of house floor contexts. Most of the shells are fragmentary. The most frequent species was *Glycymeris insubrica* and the umbo of eight of the 18 more-or-less complete valves had been perforated. One of the two *Nassarius*

gibbosulus shells had a man-made hole in the last whorl. The land snail *Helix engaddensis* is still common in the area and it is unclear whether or not it was collected for food at Yoqne'am.

Mienis, H.K., 2006. The mollusc remains. In: van der Brink, E.C.M. and Gophna, R. (eds), *Shoham (North): Late Chalcolithic burial caves in the Lod Valley, Israel*. Jerusalem, Israel Antiquities Authority (IAA Reports 27). pp. 155-157.

ABSTRACT: Eleven samples of molluscan remains comprising 18, mostly heavily damaged or fragmentary, shells were examined from Caves 2 and 4 at this site in Israel. Six species were represented: *Hexaplex trunculus* (n=1), *Glycymeris insubrica* (n=4) and *Cerastoderma glaucum* (n=1) from the Mediterranean Sea; the land snail *Levantina spiriplana werneri* (n=1); and the freshwater mussels *Chambardia rubens arcuata* (n=8) and *Unio mancus eucirrus* (n=3). The marine species were probably obtained by trade and three of the five bivalve shells were holed for suspension. The land snail is endemic to the area and is edible, although larger numbers might be expected if this species had been eaten at Shoham. The freshwater mussel species may have been valued for their mother-of-pearl: the *Unio* is a local species but *Chambardia*, which comprised eight of the 18 shells examined, was imported from the Nile Valley.

2,400 Years of Malacology

Alan Kabat has drawn our attention to the online publication of the third edition of *2,400 Years of Malacology* in January 2006, compiled and edited by Eugene V. Coan, Alan R. Kabat and Richard E. Petit, which is posted on the website of the American Malacological Society at http://www.malacological.org/publications/2400_malacology.html

This 664-page publication provides a comprehensive catalogue of biographical and bibliographical papers on over 7000 malacologists, conchologists, palaeontologists and others with an interest in molluscs, from Aristotle to the present. For each person, their dates and nationality are given (when known), followed by bibliographic citations to the literature concerning them and their collections and publications.

An increasing number of important historical and reference works is being digitised and made available online, including the entire set of the Challenger Expedition volumes and the *Systema Naturae* of Linnaeus (1758), with the object of making rare publications more readily available. This publication also provides links to online digitised works in systematic malacology.

Since the posting of the first edition in June 2004, more data have been added and the third edition has a more complete coverage of palaeontologists as well as more extensive coverage of the 19th-century explorers and naturalists of Central and South America. The catalogue also includes individuals whose contributions to malacology are far less well known than their contributions in other fields, including the 19th-century Danish children's author Hans Christian Andersen (1805-1875), who was also an avid collector of land and freshwater molluscs.

Appendices provide citations to publications on oceanographic expeditions that resulted in the collection and description of molluscs; histories of malacological institutions and organisations; and histories and dates of publication of malacological journals and journals that are frequently cited in malacological publications. Two articles from the *Archaeo+Malacology Group Newsletter* are cited.

The catalogue is a work in progress and updated versions will be posted periodically. Readers are encouraged to explore and use this catalogue, and comments and citations to new or overlooked papers are invited. *2,400 Years of Malacology* is available in pdf in easily downloadable chunks.

Archaeomalacology: molluscs in former environments of human behaviour

The proceedings of the archaeomalacology session held at the 9th Conference of the International Council of Archaeozoology in Durham, UK, in August 2002 were published by Oxbow Books at the end of 2005. *Archaeomalacology: molluscs in former environments of human behaviour*, edited by Daniella E. Bar-Yosef Mayer, forms one of a series of 14 monographs that cover different sessions presented at the 2002 ICAZ Conference.

For the first time, this volume brings molluscan studies into mainstream archaeozoological and archaeological debates. The range and scope of the 17 contributions, which represent work carried out on three continents, demonstrate how much archaeomalacology has developed in recent years. Following an editorial, which discusses the significance of molluscan remains for the interpretation of past environments and human societies, and includes a brief history of archaeomalacology, the papers are divided into three sections: America, Europe and Asia.

The American section includes four papers: Land snails, artifacts and faunal remains: understanding site formation processes at prehistoric/protohistoric sites in the southeastern United States (Evan Peacock, Janet Rafferty and S. Homes Hogue); Seasonal collection of coquina clams (*Donax variabilis* Say, 1822) during the Archaic and St Johns periods in coastal northeast Florida (Irvy Quitmyer, Douglas S. Jones and C. Fred T. Andrus); Pre-Columbian Preceramic shellfish consumption and shell tool production: shell remains from Orient Bay, Saint-Martin, northern Lesser Antilles (Nathalie Serrand and Dominique Bonnissent); Shell middens on the Caribbean coast of Nicaragua: prehistoric patterns of mollusc collection and consumption (Ermengol Gassiot Ballbè).

The eight papers from Europe are: Marine mussel shells – wear is the evidence (Jan Light); The malacofauna of the Upper Palaeolithic levels at Grotta della Serratura (Salerno, southern Italy): preliminary data (André Carlo Colonese and Barbara Wilkens); Shells at the Bronze Age settlement of Coppa Nevigata (Apulia, Italy) (Claudia Minniti); The evidence of *Spondylus* ornamental objects in the central Mediterranean Sea: two case studies, Sicily and Malta (Salvatore Chilardi, Lorenzo Guzzardi, Maria Rosa Iovino and Annalisa Rivoli); Shells from prehistoric sites in northern Greece (Lilian Karali); Reconstructing murex Royal Purple and Biblical Blue in the Aegean (Deborah Ruscillo); Molluscs from a middle Bronze Age site and two Hellenistic sites in Thessaly, Greece (Wietske Prummel); Early Preceramic Neolithic marine shells from Shillourokambos, Cyprus (late 9th-8th mill. cal BC): a mainly-ornamental set with similarities to mainland PPNB (Nathalie Serrand, Jean-Denis Vigne and Jean Guilane).

The volume ends with five contributions from Asia: The mollusc fauna from the Late Bronze and Iron Age strata at Tel Abu Hawam (Inbar Baruch, Michal Artzy, Joseph Heller, Jacqueline Balensi and Maria D. Herrera); Shifts in Epipalaeolithic marine shell exploitation at Wadi Mataha, southern Jordan (Joel C. Janetski); The use of marine shells at Sumhuram, Oman (Barbara Wilkens); The shell material from Suwayh I (Oman, Neolithic) (Chloe Martin); Marine shell utilisation by the Chalcolithic culture of the Western Deccan region of India (Arati Deshpande-Mukherjee).

This 184-page, A4-sized hardback book is well-produced and well-illustrated, and presents an important overview of the state of archaeomalacology today. Copies are available from Oxbow Books, Park End Place, Oxford OX1 1HN, UK; The David Brown Book Company, PO Box 511, Oakville, CT 06779, USA; and via www.oxbowbooks.com (UK price: £40.00).
