An incised shell object from Baradostian (Early Upper Palaeolithic) layers in Shanidar Cave, Iraqi Kurdistan

Chris O. Hunt[1]*, Evan A. Hill[2], Tim Reynolds[3], Dlshad Abdulmutalb[4], Lucy Farr[5], Ross Lane[6], Katherine Szabó[7] and Graeme Barker[5]

1. School of Natural Sciences & Psychology, Liverpool John Moores University, Byrom Street, Liverpool L3 3AF, UK (Email C.O.Hunt@ljmu.ac.uk)

2. School of Natural & Built Environment, Queen's University Belfast, Belfast BT7 1NN, UK (Email rithgard@gmail.com)

3. Department of History, Classics and Archaeology, Birkbeck College, University of London, Malet Street, London WC1E 7HX, UK (Email te.reynolds@bbk.ac.uk)

4. Directorate of Antiquities (Soran Province), Soran, Kurdistan, Iraq (Email: dlshad505@yahoo.com)

5. McDonald Institute for Archaeological Research, University of Cambridge, Cambridge CB2 3ER, UK (Email [LRF] lrf24@cam.ac.uk [GB] gb314@cam.ac.uk)

6. Canterbury Archaeological Trust Ltd., 92A Broad Street, Canterbury, Kent CT1 2LU, UK (Email Ross.Lane@canterburytrust.co.uk)

7. Centre for Archaeological Science, University of Wollongong, Building 41, Northfields Avenue, Wollongong, NSW 2522, Australia

* Corresponding author C.O.Hunt@ljmu.ac.uk phone +44 (0)7802 403421

Keywords: Shanidar; Upper Palaeolithic; Baradostian; Land snail; Shell artefact;

Highlights:

An incised shell fragment from the Upper Palaeolithic of Shanidar Cave

Baradostian – Upper Palaeolithic - equivalent to the Aurignacian

Natural causes or subsistence activity unlikely

Possibly from manufacture of multi-component item for visual display

An incised shell object from Baradostian (Early Upper Palaeolithic) layers in Shanidar Cave, Iraqi Kurdistan

Abstract

Shanidar Cave contains one of the most important Palaeolithic archaeological sequences in West Asia. During renewed excavations of Baradostian (Upper Palaeolithic) layers in the cave, an incised land-snail shell fragment was recovered. A natural cause seems unlikely and it does not appear likely to reflect palaeoeconomic functions. It is suggested tentatively that this may have been made during manufacture of a composite artefact designed for visual display. Although Upper Palaeolithic ornaments are often reported, composite ornaments of this period are rather unusual.

Introduction

The initiation of the Upper Palaeolithic in Europe and parts of the Middle East is widely seen as a major discontinuity, where material culture changed in response to population turnover, as Neanderthals were replaced by anatomically-modern humans (e.g. Bar-Yosef 2002; Mellars 2006). In these regions, one of the cultural changes which seem to have occurred after this transition is the fairly widespread appearance of items of material culture which are not directly linked to palaeoeconomic functions. This material culture, often known as 'art' and 'adornment' is widely thought to have had ritual and/or culture-expressive functions and to have indicated 'behavioural modernity' in the producing groups (e.g. McBrearty and Brooks 2001; Bolus and Conard 2001; Bar-Yosef 2002). Similar material culture is also associated with the precursor anatomically modern human populations in Africa (e.g. McBrearty and Brooks 2001; Bouzouggar et al. 2007; Marean 2015). Although a number of objects have been claimed to reflect similar capacities in Neanderthals (e.g. Zilhao 2010, Finlayson et al. 2012; Douka and Spinapolice 2012) these instances are rare and in some cases are argued to be likely to reflect sedimentary mixing, as has been argued for the Chatelperronian of the Grotte du Renne and other sites (e.g. Higham et al. 2010).

This paper describes an incised shell object from near the base of Baradostian (Early Upper Palaeolithic) layers in Shanidar Cave, Kurdish Iraq. The cave (N36˚ 50', E44˚ 20'), in the High Zagros Mountains at an elevation of ~745 m above sea level, was first excavated in the mid to late 1950s by Ralph Solecki (1955, 1963). He found a sequence of layers characterised by different lithic industries. At the base of the sequence he found layers characterised by Mousterian artefacts, from which he recovered the skeletal remains of ~10 Neanderthals. These were overlain by layers containing artefacts he assigned to the Baradostian, an Upper Palaeolithic industry which is held to be the local facies-equivalent of the Aurignacian (Otte

and Kozlowski 2011, Tsanova 2013) and which is associated with remains of anatomically modern humans at Eshkaft-e Gavi and Warwasi (Scott and Marean 2009, Tsanova 2013). The layers containing Baradostian artefacts at Shanidar are then overlaid by an Epipalaeolithic cemetery and later layers. The focus of Solecki's work was initially the Neanderthal-bearing layers, and later the Epipalaeolithic cemetery. The layers containing Baradostian material were given relatively less attention. Although Solecki screened his excavated sediment, his mesh size seems to have been too coarse to recover many small objects, as our excavation of one of his spoil heaps yielded much small cultural material.

Materials and Methods

Since 2014, a team led by Graeme Barker, Tim Reynolds and Chris Hunt has been re-evaluating the deposits of Shanidar Cave, with intensive sampling and limited single-context excavation of the deposits adjoining Solecki's old trench through the complete stratigraphic sequence, so far down to ~9 m below the cave floor (Reynolds et al. 2016). All excavated sediment has been wet-sieved and floated by context and square using a flotation machine.

The land snail object (Object 245) described here comes from context 3107 in square 63/54 (Figs. 1, 2) and was sorted from the heavy residues from the flotation machine for this context. This and adjacent contexts also yielded fragmentary animal bone, land mollusc shell and lithic artefacts of Upper Palaeolithic aspect which can be assigned to the Baradostian.

All mollusc remains were identified under low-power binocular microscopes. A Meiji zoom (4-50x) stereomicroscope with a Luminera Infinity 1-3C digital imaging system was used to image the object.

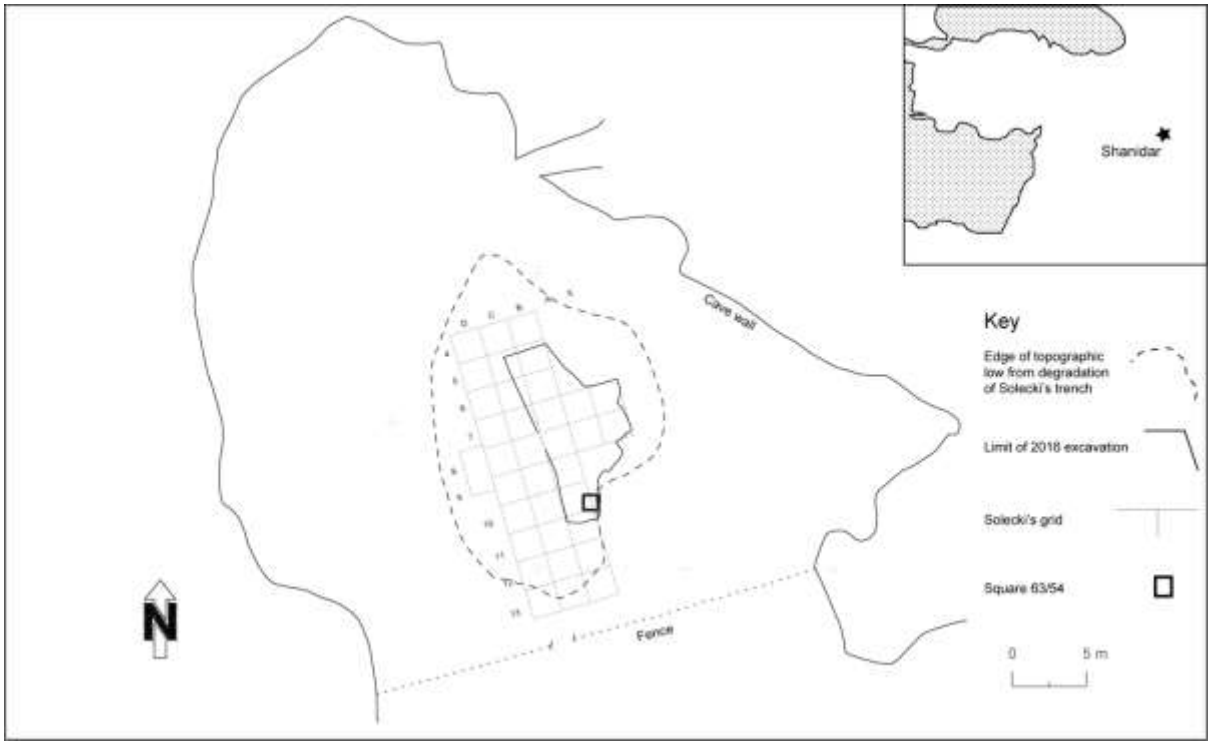

Fig. 1. Plan of the renewed excavation in the cave, showing the location of square 63/54.

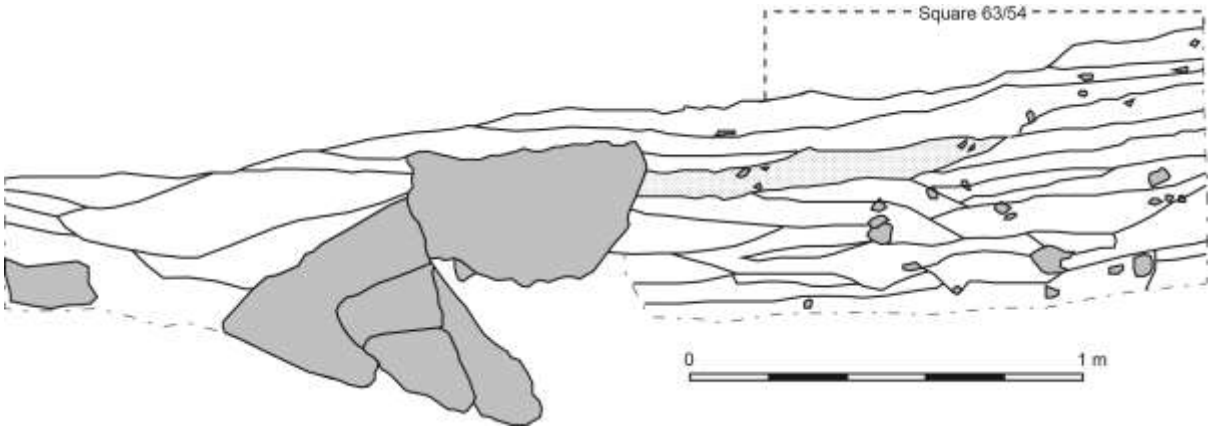

Fig. 2. Section drawing of the baulk on the east side of square 63/54 showing the location of context 3107 (stippled). Rocks are shaded grey

The shell object

This is an approximately rectangular fragment from the body whorl of a large land snail shell that can most probably be assigned to the helicid genus *Assyriella* (Fig.3). It measures 9.2 x 4.6 mm, and is 0.8-1.1 mm thick. The side which was the internal surface of the original shell (Figs. 4, 5) bears five sub-parallel straight incisions running normal to the long axis of the object, spaced approximately equidistant along the rectangle. Traces of two further sub-parallel incisions are preserved at the ends of the piece, where it appears that they

guided the snapping-off of the ends of the fragment. A further incision is at one end of the object, running at approximately 30^{o} to the sub-parallel set of incisions. Another very shallow incision is apparent running approximately at right angles to the group of sub-parallel incisions. The incisions have V-shaped cross sections and appear to have been made by a very sharp point with a smooth triangular section. There is slight edge-rounding, suggesting some form of transport of this fragile and friable object by mudflow or running water.

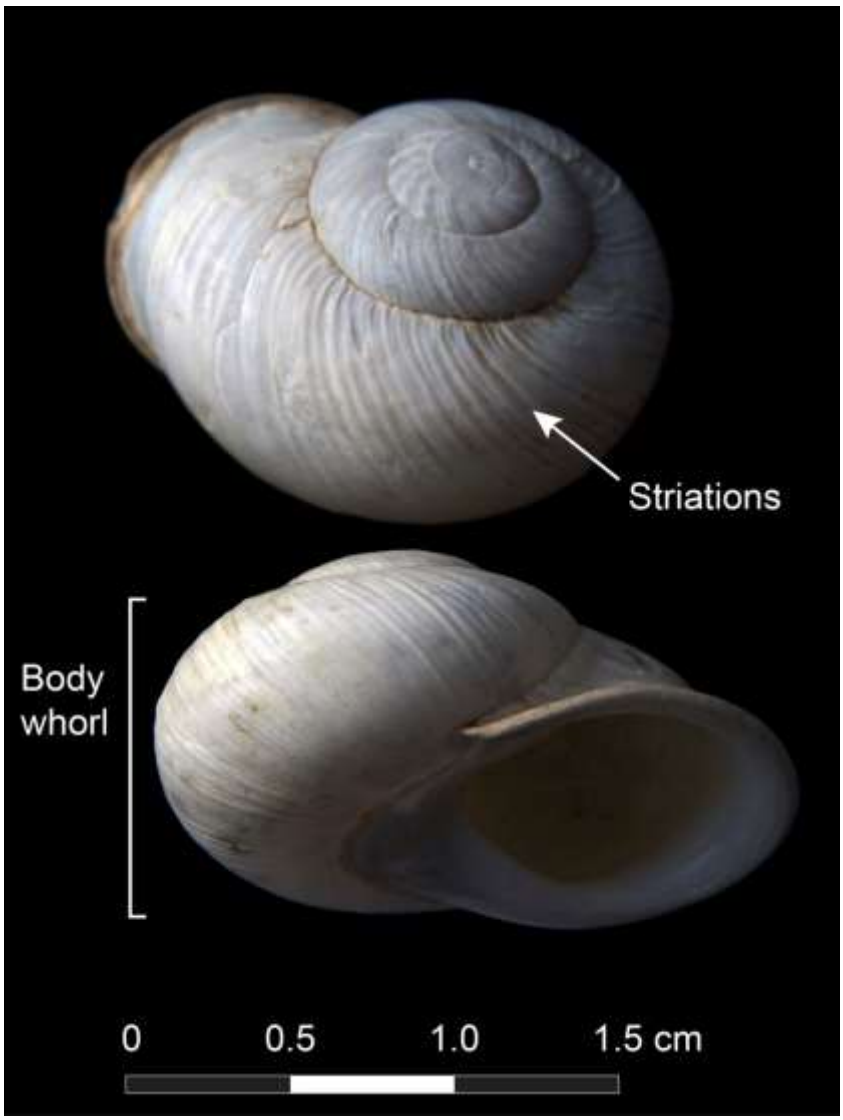

Fig. 3. *Assyriella* sp. showing body whorl and striations

Fig. 4. Internal surface of the original shell showing set of sub-parallel incisions. Scale in microns.

Fig. 5. Internal surface of original shell at high magnification, showing detail of incisions. Scale in microns.

The external face (Figs. 6, 7) shows three natural striations running down the long axis of the piece. These are cut at right-angles by twelve sub-parallel incisions, which have the effect of dividing the striations into a set of approximately rectangular prominences. These are very rough in aspect and show traces of pitting and corrosion (Fig. 7). Whether this is a natural taphonomic pattern or the result of corrosion by some applied material is at present uncertain, but the pattern of corrosion is not replicated on the other thousands of shell fragments from the same species so far found in the cave.

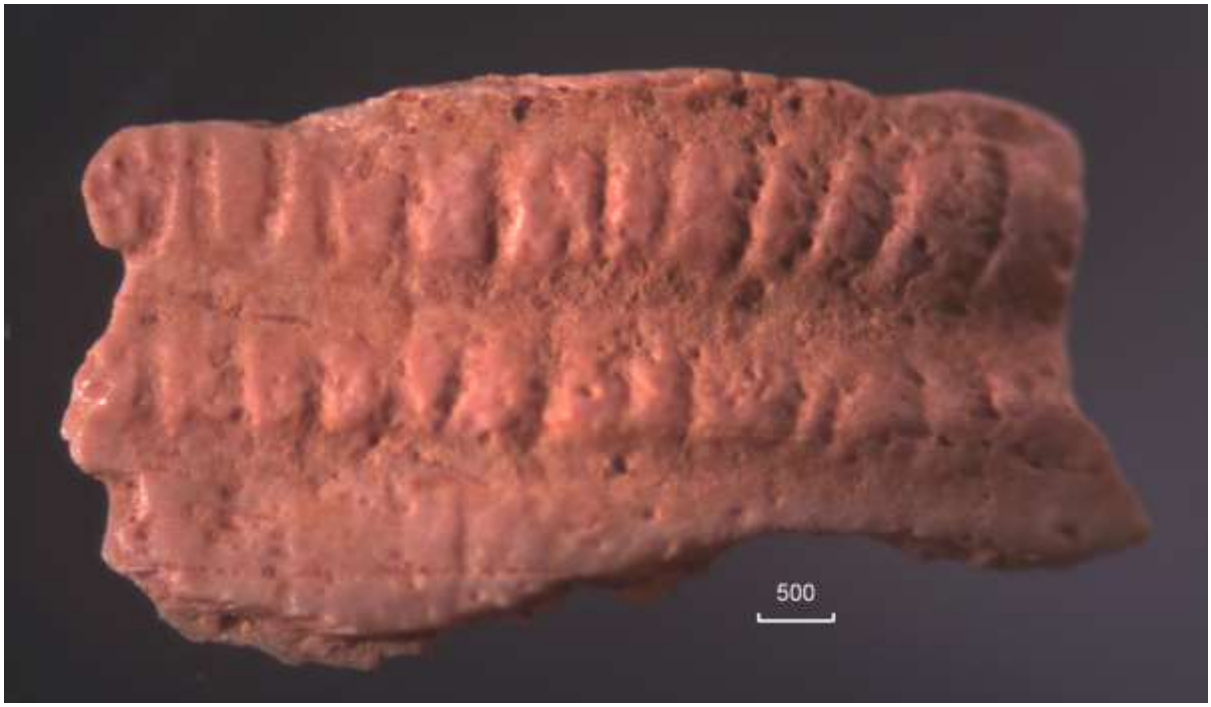

Fig. 6. External surface showing natural striations cut at right angles by twelve subparallel incisions. Scale in microns

Fig. 7. Close-up of incisions on original exterior face of the shell running across the natural striations, also showing surface pitting and corrosion. Scale in microns.

Discussion

There is no natural process known to the authors which would lead to the very regular incisions on the interior face and the less regular incisions on the external face of the object. Although we cannot exclude fully the possibility that a fragment of shell was raked by the sharp claws of some burrowing animal, this does not account for the morphology of the exterior surface of the piece. Moreover, the careful single-context excavation of this area did not show evidence for animal burrowing although there were occasional signs of root penetration. The slight edge-rounding is consistent with limited transport from the place of manufacture, probably by the mass-movement processes that emplaced context 3107.

It seems rather unlikely that the morphology of the object results from food production. Although land snails were consumed throughout the Late Pleistocene (e.g. Lubell 2004; Hutterer et al. 2010; Rabett et al. 2011; Hill et al. 2015), including in Layer B at Shanidar (Lubell 2004) most land snails of the size of *Assyriella* seem to have been consumed with minimal damage to the shell (e.g. Lubell et al. 1976; Rabett et al. 2011) or with simple piercing by a thorn, lithic point or the consumer's canine tip to break the suction and enable the animal to be sucked wholesale from the shell(e.g. Hutterer et al. 2011, 2014; Hill et al. 2015; Hunt and Hill 2017). The pattern of incisions on this fragment is unlike the patterns of damage associated with shell piercing.

The shell fragment is too small and weak to have had a role in processing other materials. It is rather unlikely that it was used as an anvil for cutting soft materials using a stone artefact, because of the weakness of the land snail shell. We can therefore suggest tentatively that this piece, if humanly formed, did not have a palaeoeconomic or technological function. The use of land snail shell in non-subsistence behaviour is unusual, but reported from Holocene sites at Mount Carmel in Israel, and in the Middle Palaeolithic of Porc-Epic Cave in Ethiopia. At both localities the operculae of pomatid landsnails were pierced to make beads (Mienis 1990; 2003; Assefa et al. 2008).

In the case of the land snail fragment from Shanidar, it is possible that the bright white shiny interior of the *Assyriella* shell was attractive and therefore used in some sort of decorative or ornamental context. The grooving on the interior face might suggest that the fragment was to be broken into little chips along the grooves. The rough grooving and corrosion on the external surface might suggest preparation for and the application of some sort of slightly corrosive substance, possibly an adhesive. In turn, this might suggest that this piece was perhaps part of the manufacture of some perishable composite artefact, presumably for visual display of some sort. It is perhaps worth noting that the area upslope from where the object was recovered is close to the mouth of the cave and thus would have had excellent natural illumination for detailed manufacturing work.

The Aurignacian is widely associated with the manufacture of items for personal ornamentation (e.g. Kuhn et al. 2001; White 2007). The Baradostian is also associated with this practice, as pierced shells and teeth have been reported from Yafteh Cave (Otte et al. 2007). The suggestion that this incised shell fragment from Shanidar was for visual display is thus consistent with our understanding of Aurignacian and Baradostian behaviour.

Although Aurignacian and Baradostian technology is characterised by the manufacture of composite artefacts, such as the use of blade/bladelet-based technology associated with armatures (e.g. Tsanova 2013), most of their personal ornaments are not composite. This find is therefore rather unusual, since it appears to be part of a composite object for visual display.

Conclusion

New excavations at Shanidar Cave in layers characterised by Upper Palaeolithic Baradostian technology have recovered an incised fragment of land snail shell. This object seems unlikely to result from natural causes, or human consumption, or from use in the manufacture of other technology. It is possible, however, that it was manufactured as part of a composite object for visual display. Although composite lithic technology is one of the marks of Upper Palaeolithic industries such as the Baradostian, it is rather unusual for composite ornamental pieces of this period to be found.

Acknowledgments

We thank the Kurdish Regional Government, the former High Representative in London Bayan Sami Abdul Rahman, and their Antiquities Service especially Director Abubakir Othman Zinadin (Mala Awat) for their encouragement and practical support. We thank the Leverhulme Trust for funding this research through RPG-2013-105. We thank our colleagues of the Shanidar field team for help and support in the field and Marcel Otte and David Lubell for very constructive and helpful reviews.

References

Assefa, Z., Lam, Y. M., Mienis, H. K. 2008. Symbolic use of terrestrial gastropod opercula during the Middle Stone Age at Porc-Epic Cave, Ethiopia. *Current Anthropology* 49, 4, 746–756.

Bar, Z. 1977. Human consumption of land snails in Israel, *Basteria* 41, 53–58

Bar-Yosef, O. 2002. The Upper Paleolithic revolution. *Annual Review of Anthropology* 31, 363–393.

Bolus, M., Conard, N.J. 2001. The late Middle Paleolithic and earliest Upper Paleolithic in Central Europe and their relevance for the Out of Africa hypothesis. *Quaternary International* 75, 29-40.

Bordes, J.-G., Teyssandier, N. 2012. The Upper Paleolithic nature of the Châtelperronian in South-Western France: Archeostratigraphic and lithic evidence. *Quaternary International*, 246, 1-2, 382-388.

Bouzouggar, A., Barton, N, Vanhaeren, M., D'errico, F., Collcutt, S., Higham, T., Hodge, E., Parfitt, S., Rhodes, E., Schwenninger, J.-L., Stringer, C., Turner, E., Ward, S., Moutmir, A., Stambouli, A. 2007. 82,000-year-old shell beads from North Africa and implications for the

origins of modern human behaviour. *Proceedings of the National Academy of Sciences* 104, 24, 9964-9969.

Douka, K., Spinapolice, E.E. 2012. Neanderthal Shell Tool Production: Evidence from Middle Palaeolithic Italy and Greece. *Journal of World Prehistory* 25, 45–79.

Finlayson, C., Brown, K., Blasco, R., Rosell, J., Negro, J.-J., Bortolotti, G., Finlayson, G., Marco, A.S., Pacheco, F.G., Vidal, J.R., Carrion, J.S., Fa, D.A., Rodriguez-Llanes, J.M. 2012. Birds of a Feather: Neanderthal Exploitation of Raptors and Corvids. *PLOS One* 7, 9, e45927.

Hill, E. A., Hunt, C. O., Lucarini, G., Mutri, G., Farr, L., Barker, G. 2015. Land gastropod piercing during the Late Pleistocene and Early Holocene in the Haua Fteah, Libya. *Journal of Archaeological Science: Reports* 4, 320-325.

Higham ,T., Jacobi, R., Julien, M., David, F., Basell, L., Wood, R., Davies, W., Ramsey, C. B. 2010. Chronology of the Grotte du Renne (France) and implications for the context of ornaments and human remains within the Châtelperronian. *Proceedings of the National Academy of Sciences* 107, 47, 20234–20239.

Hunt, C.O., Hill, E.A. 2017. Caves and molluscs. Chapter 6 in Allen, M.J. (ed.) *Molluscs in Archaeology: Methods, approaches and applications*. Barnsley: Oxbow, 100-110.

Hutterer, R., Mikdad, A., Ripken, T.E.J. 2011. Species composition and human exploitation of terrestrial gastropods from Taghit Haddouch, an Early Holocene archaeological site in NE Morocco. *Archives für Molluskenkund* 140, 57–75.

Hutterer, R., Linstädter, J., Eiwanger, J., Mikdad, A. 2014. Human manipulation of terrestrial gastropods in Neolithic culture groups of NE Morocco. *Quaternary International* 320, 83–91.

Kuhn, S., Stiner, M., Reese, D.S., Güleç, E. 2001. Ornaments of the earliest Upper Paleolithic: New insights from the Levant. *Proceedings of the National Academy of Sciences* 98, 13, 7641-7646.

Lubell, D. 2004. Prehistoric edible land snails in the circum-Mediterranean: the archaeological evidence. In Brugal, J., Desse, J. (eds.) *Petits animaux et sociétés humaines. Du complément alimentaire aux ressources utilitaires*. XXIVe rencontres internationales d'archéologie et d'histoire d'Antibes, 41-62

Lubell, D., Hassan, F.A., Ballais, J.-L. 1976. The Capsian escargotieres. *Science* 191, 4230, 910–920.

Marean, C.W. 2015. An evolutionary anthropological perspective on modern human origins. *Annual Review of Anthropology* 44, 1, 533–556.

McBrearty, S. Brooks, A.S. 2000. The revolution that wasn't: a new interpretation of the origin of modern human behaviour. *Journal of Human Evolution* 39, 453–563.

248 Mellars, P. 2006. Archeology and the dispersal of modern humans in Europe: Deconstructing
249 the "Aurignacian." *Evolutionary Anthropology* 15, 5, 167–182.

250 Mienis, H. K. 2003. Molluscs from the excavation of Horvat Raqit, Carmel. In Dar, S. (ed.),
251 *Raqit – Marinus Estate on the Carmel, Israel*. Tel Aviv: Eretz-Geographic Research and
252 Publications/Israel Exploration Society, 55–56.

253 Otte, M., Biglari, F., Flas, D., Shidrang, S., Zwyns, N., Maskour, M., Naderi, R., Mohasb, A.,
254 Hashemi, N., Darvish, J., Radu, V. 2007. The Aurignacian in the Zagros region: new research
255 at Yafteh Cave, Lorestan, Iran. *Antiquity* 81, 82-96.

256 Otte, M., Kozlowski, J. 2011. La Transition du Moustérien à L'aurignacien au Zagros. In Le
257 Tensorer, J.-M., Jagher, R., Otte, M. (eds.). *The Lower and Middle Palaeolithic in the Middle*
258 *East and Neighbouring Regions*. *Basel Symposium (May 8-10 2008)*, Liège: ERAUL 126, 183-
259 195.

260 Rabett, R., Appleby, J., Blyth, A., Farr, L., Gallou, A., Griffiths, T., Hawkes, J., Marcus, D.,
261 Marlow, L., Morley, M., Tâń, N.C., Son, N.V., Penkman, K., Reynolds, T., Stimpson, C., Szabó,
262 K. 2011. Inland shell midden site-formation: investigation into a late Pleistocene to early
263 Holocene midden from Tràng An, Northern Vietnam. *Quaternary International* 239, 153–
264 169.

265 Reynolds, T., Boismier, W., Farr, L., Hunt, C., Abdulmutalb, D., Barker, G. 2016. New
266 investigations at Shanidar Cave, Iraqi Kurdistan. *Antiquity Project Gallery*
267 http://antiquity.ac.uk/projgall/barker348

268 Scott, J.E., Marean, C.W. 2009. Paleolithic hominin remains from Eshkaft-e Gavi (southern
269 Zagros Mountains, Iran): description, affinities, and evidence for butchery. *Journal of Human*
270 *Evolution* 57, 248-259.

271 Solecki R.S. 1955. Shanidar Cave, a Palaeolithic Site in Northern Iraq. *Smithsonian*
272 *Institutional Annual Report (for 1954)*, 389-425.

273 Solecki R.S. 1963. Prehistory in Shanidar valley, Northern Iraq. *Science* 139, 1551, 179-193.

274 Tsanova, T. 2013. The beginning of the Upper Paleolithic in the Iranian Zagros. A
275 taphonomic approach and techno-economic comparison of Early Baradostian assemblages
276 from Warwasi and Yafteh (Iran). *Journal of Human Evolution* 65, 39-64.

277 White, R. 2007. Systems of Personal Ornamentation in the Early Upper Palaeolithic:
278 Methodological Challenges and New Observations. In, Mellars, P., Boyle, K., Bar-Yosef, O.,
279 Stringer, C. (eds.) *Rethinking the Human Revolution: New Behavioural and Biological*
280 *Perspectives on the Origin and Dispersal of Modern Humans*. Cambridge, UK. McDonald
281 Institute Monographs, McDonald Institute for Archaeological Research, 287-302.

Zilhão, J., Angelucci, D.E., Badal-García, E., d'Errico, F., Daniel, F., Dayet, L., Douka, K., Higham, T.F.G., Martínez-Sánchez, M.J., Montes-Bernárdez, R., Murcia-Mascarós, S., Pérez-Sirvent, C., Roldán-García, C., Vanhaeren, M., Villaverde, V., Wood, R., Zapata, J. 2010. Symbolic use of marine shells and mineral pigments by Iberian Neandertals. *Proceedings of the National Academy of Sciences* 107, 3, 1023–1028.