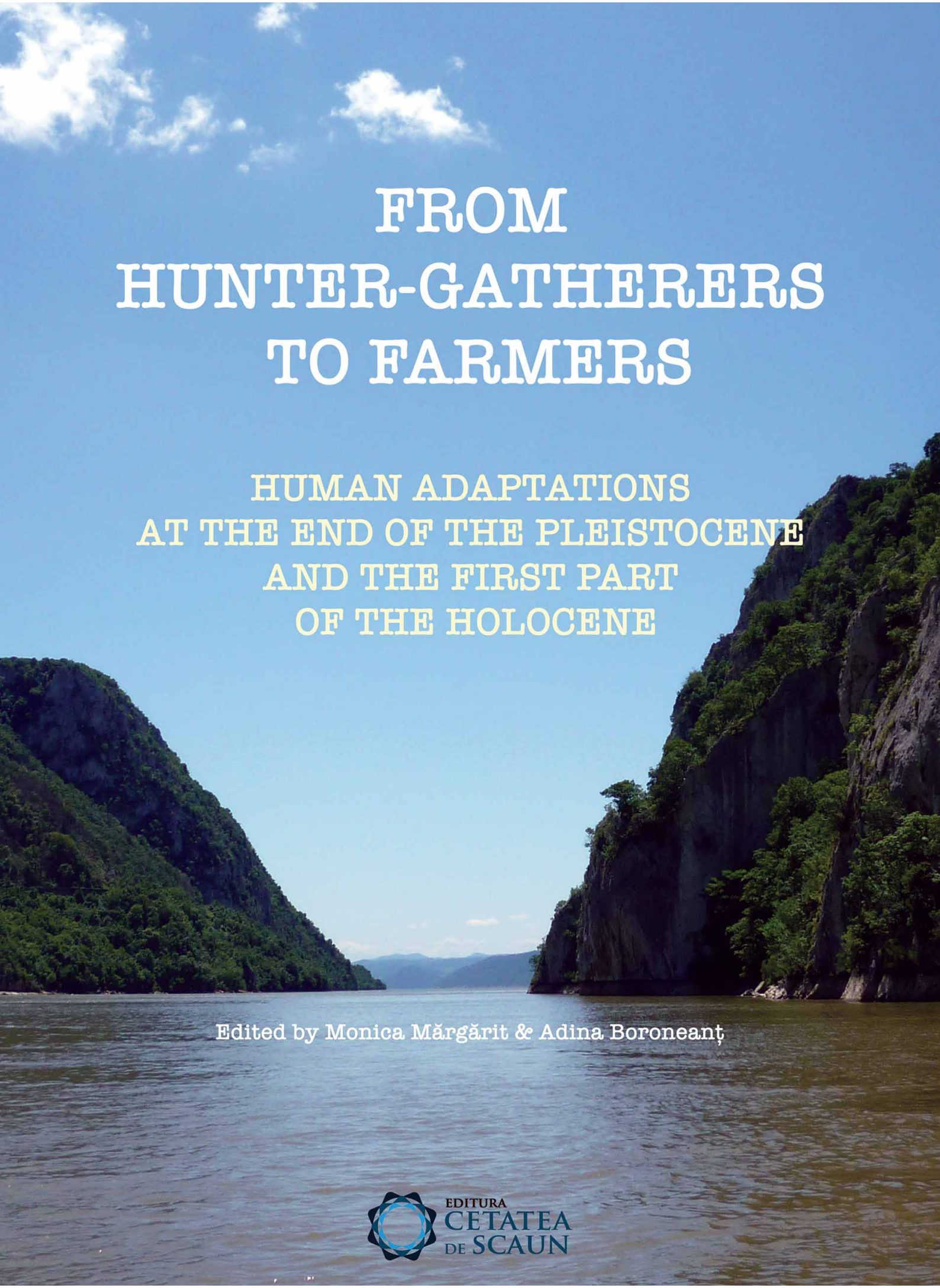

FROM HUNTER-GATHERERS TO FARMERS

HUMAN ADAPTATIONS AT THE END OF THE PLEISTOCENE AND THE FIRST PART OF THE HOLOCENE

Edited by Monica Mărgărit & Adina Boroneanț

EDITURA CETATEA DE SCAUN

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Photo cover: The Danube at Cazanele Mici (the Smaller Cauldrons) in the Iron Gates (photo Adina Boroneanț).

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PROFESSOR CLIVE BONSALL

EDITORIAL

It is difficult to capture one's life in a few words, a few photographs or even a book. The papers in the present volume will hopefully reflect a part of Clive Bonsall's scientific interests during a career that has started some 45 years ago. Their diversity is impressive: from radiocarbon dating, environmental changes, human–environment interactions, funerary behaviour, to paleogenetics and stable isotopes, reconstruction of ancient diets and obsidian sourcing, most of them in close connection to the hunter-gatherer and first farmer communities of Europe. His studies stretched over a large geographical area, focusing recently mainly around the Balkans and the neighbouring regions. He has conducted fieldwork in Britain, Scotland, Romania and Slovenia, edited 9 books and published over 160 papers, book-chapters, notes, as well as book and paper reviews. His main publications include: "The Mesolithic in Europe" (1989), "The Human Use of Caves" (1997), "The Iron Gates in Prehistory" (2008), "Submerged Prehistory" (2011) and "Not Just for Show: The Archaeology of Beads, Beadwork and Personal Ornaments" (2017).

His substantial work in southeastern Europe is reflected by his long-standing collaboration and friendship with many Romanian and Bulgarian archaeologists, and has received due recognition: Clive Bonsall is an Honorary Member of both the "Vasile Pârvan" Institute of Archaeology in Bucharest and the National Institute of Archaeology with Museum in Sofia. His contribution to the archaeology of the Iron Gates has earned him the recognition of the Serbian archaeologists working in the area. His many other research interests and personal collaborations are also reflected in the present volume.

We are grateful to all our contributors: colleagues and friends, new and old, former students and collaborators whose archaeological interests met Clive's if only briefly. We were happy to see that so many of us were able to mobilize in such a short time. We would like to thank all those who answered our call and at a time when every minute of our professional lives is carefully planned in advance, helped us put together this volume in less than a year. They have endured and complied with our constant deadline reminders and requests, checked and re-checked their manuscripts in record times, gracefully complying with the comments and suggestions from the reviewers, and were most patient with our editorial work.

Each paper was submitted to a double reviewing. We would like to also thank our colleagues from various disciplines who accepted to anonymously review the contributions. Their hard and serious work significantly improved the overall content of the volume.

The outcome has exceeded our most optimistic expectation: a volume that geographically covers almost the entire European continent, from Britain to Russia and Greece and touches on most important issues of hunter-gather adaptions through time. A volume brought together by chronological landmarks (the end of the Pleistocene and the beginning of the Holocene) and geographical areas but also by common approaches to issues such as human-animal interactions, exploitation and use of raw materials, and subsistence strategies.

We chose to organize the papers on three main sections, while within the respective theme they follow in chronological succession. The archaeology of the Iron Gates opens the volume, given Clive Bonsall's substantial contribution to the local early prehistory. The eight contributions cover a large range of subjects, from physical anthropology (Andrei Soficaru), re-interpretation of earlier excavations and the subsequent collections (Adina Boroneanț), stone artefacts (Dragana Antonović, Vidan Dimić, Andrej Starović and Dušan Borić) to the study of faunal remains and subsequent paleo-dietary issues (Adrian Bălășescu, Adina Boroneanț and Valentin Radu; Dragana Filipović, Jelena

Jovanović and Dragana Rančić; Ivana Živaljević, Vesna Dimitrijević and Sofija Stefanović), and osseous industries (Monica Mărgărit and Adina Boroneanț; Selena Vitezović). These studies illustrate the still immense research potential of the Iron Gates region despite the fact that most of the sites have been flooded many decades ago.

During the editing of the volume it became obvious that while some of the contributions focused on the evidence from a certain site, others were more of a regional synthesis. This latter section begins with a most interesting paper bringing together world history and underwater archaeology (Jonathan Benjamin and Geoff Bailey). The following nine articles deal with subjects such as social inequalities seen through the study of burial practices (Judith M. Grünberg), lifeways, adaptations and subsistence strategies of the early prehistoric communities (Agathe Reingruber; Mihael Budja; Annie Brown and Haskel Greenfield; Kenneth Ritchie), raw materials acquisition and exploitation (Tomasz Płonka, Maria Gurova, Eva David), exploitation, management and trade of „exotic" goods (Vassil Nikolov).

The nine papers focusing on individual sites present case studies that illustrate the nature of the current research, the rich opportunities offered by the growing range of scientific techniques and their applications to existing collections. This series of papers starts at Zemunica Cave on the coast of the Eastern Adriatic (Siniša Radović and Ankica Oros Sršen), explores the Mesolithic occupations at Malga Rondenetto (Paolo Biagi, Elisabetta Starnini and Renato Nisbet) and Grotta dell'Edera (Barbara Voytek) in Italy, the Mesolithic ornamented weapons of Motala in Sweden (Lars Larsson and Fredrik Molin), ending this Mesolithic journey among the shell middens on the western coast of Scotland (Catriona Pickard). The transition to the Neolithic happens among the beaver tools at Zamojste 2 in Russia (Olga Lozovskaya, Charlotte Leduc and Louis Chaix). The Neolithic Age finds us further south into Bulgaria, exploring the pitfields of Sarnevo (Krum Bacvarov and John Gorczyk) and the gold of Varna (Tanya Dzhanfezova), while during the Bronze Age roe deer hunting is resurrected at Paks–Gyapa in Hungary (László Bartosiewicz and Erika Gál).

The volume presents altogether new results in recent research and new information resulted from the study of old collections. We also hope it points out directions for future research.

It is with great joy that we present Clive Bonsall this volume, as a token of both our appreciation and friendship, for his contributions to the Early Prehistory of Europe in general, and of Southeastern Europe in special.

The Editors

CLIVE BONSALL – SOME YEARS AFTER

When Clive Bonsall came to Romania in 1991, I was taking an undergraduate degree in computers and wasn't even considering becoming an archaeologist. Together with my mother and brother, I used to accompany my father Vasile Boroneanț every year on his summer digs at Schela Cladovei. It was just over a year after the fall of the communist regime in Romania, and everybody at the site was waiting impatiently the arrival of a team of archaeologists from Great Britain, who were coming to visit the site and perhaps start a joint research project. It must have been past mid-night of the expected day when my father woke us up – because the "English" had arrived…. Four very tired people (Clive Bonsall, Kathleen McSweeney, Sue Stalibrass and Mark Macklin – and not all "English") in a Land Rover but still managing to smile… They had spent 10 hours at the border between Hungary and Romania and their first encounter with Romanian cuisine had been carp-head soup (the only thing available on the menu) in Arad…. I believe Clive still remembers the fish-heads sticking out of the large bowl (obviously a reminder of the Lepenski Vir sculpted boulders…).

The visit at the site went well and the next year the research project commenced, but not unventfully. It must have been sheer passion for archaeology and keen interest for the Iron Gates Mesolithic that made Clive come back the second year, after having (during the previous first year) the minibus tyres slashed several times by the curious and mischievous Schela Cladovei lads, bits of the flotation equipment vanishing into thin air and two pairs of his new Levis jeans (a rarity in Romania in those days) mysteriously disappearing from his room at the youth camp in Gura Văii…..Not to mention the breaking down of the minibus in a country where there were no spare parts for western cars.

Still, here he is, working in Romania, 26 years later…

And following the first four years of the Schela Cladovei project I had switched to a degree in archaeology (and Clive bears much of the blame…). And we are still excavating at Schela Cladovei…and at least Clive looks unchanged… It is his dedication to the archaeology of the area that has made this second research project possible, project going on successfully for over ten years now.

As it was with me, Clive has influenced the lives of many (older and younger) archaeologists and perhaps future archaeologists. He is an inspiration to our students from the Schela Cladovei excavation and a respected professional among Romanian archaeologists. He has always been ready to help my fellow colleagues, whether it was field work, collecting samples, editing or mere professional advice, although such work had rarely anything to do with the archaeology of the Iron Gates. But during his entire activity in this area, he acted as a "human bridge" between Romanian, Bulgarian and Serbian archaeologies, facilitating professional exchanges, easing the access to modern technologies, information and publications.

Clive Bonsall was/is equally interested in other geographical areas and research topics of European (and not only…) archaeology, and the number of people contributing to this volume testify to the impact he had on individuals and archaeologies elsewhere outside Romania.

This may not be the typical introduction to a Festschrift volume… but then, Clive is not a typical person. Rather cynical but warm hearted underneath, with a wonderful (and at times very dry) sense of humour, and great charm (when he wants it…) he makes a great project co-director and fellow-worker.

I can only but hope that our collaboration would go on for many years from now and that we'll get to see the end of the Schela Cladovei trench we started before we both retire!

Bucharest, September 2017 *Adina Boroneanț*

PUBLICATIONS OF CLIVE BONSALL

Books

- Bar-Yosef Mayer, D.A., Choyke, A. & **Bonsall, C.** (eds). 2017. *Not Just for Show: The Archaeology of Beads, Beadwork and Personal Ornaments*. Oxford, Oxbow Books.

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FAUNAL REMAINS FROM KULA, A MESOLITHIC-NEOLITHIC SITE AT THE EXIT OF THE DANUBE GORGES (SERBIA)

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Abstract: The paper presents the results of the analysis of faunal (mammal, fish and mollusc) remains from Kula, a Mesolithic-Neolithic site at the exit of the Danube Gorges in Serbia. Although the analysed sample represents only an arbitrarily saved portion of the original assemblage and is therefore biased, it offers important new insights into the variability in subsistence strategies, as well as into the use of animal bone, teeth, antler and shell in bodily decoration and artefact production. A small assemblage of mammal and fish remains includes species previously known from other sites within the Danube Gorges, with the dog as the sole domestic animal. Additional food supply of river clams and land snails is suggested on the basis of specific shell breakage patterns. Osseous artefacts and ornaments found in the assemblage are described, including those found in burial contexts.

Key words: Kula, Mesolithic, Mesolithic-Neolithic Transformation phase, Danube Gorges, faunal remains.

Introduction

Ever since the initial archaeological excavations in the 1960s, the Danube Gorges region (Fig. 1) continues to attract the attention of researchers as one of the few areas with recorded Late Pleistocene to Middle Holocene sequences in the Balkans. A great number of discovered caves, rock shelters and open-air sites attest to a long continuity of occupation during the regional Epipalaeolithic (c. 13,000-9500 cal BC), Early Mesolithic (c. 9500-7400 cal BC), Late Mesolithic (c. 7400-6300/6200 cal BC), Mesolithic-Neolithic Transformation phase (c. 6300/6200-6000/5900 cal BC) and the Early/Middle Neolithic (c. 6000/5900-5500 cal BC) (*cf.* Borić and Dimitrijević 2009; Borić 2011). Favourable hunting and especially fishing conditions lead to the higher intensity of occupation on the riverbanks, in particular from the Late Mesolithic. This period saw the emergence of first formal disposal areas for the burial of the dead, the construction of dugout dwellings, a proliferation of personal ornaments and stone and bone tools (Srejović and Letica 1978; Radovanović 1996a; Bonsall 2008; Borić 2011), as well as food resource exploitation patterns suggesting year-round occupation at least on some locations (Dimitrijević *et al*. 2016). During the following phase, complex settlements were established at the sites in the Upper Gorge, with trapezoidal-base buildings with elaborate flooring, rectangular hearths and distinctive sculpted boulders representing anthropomorphic and fishlike beings (Srejović 1969; Srejović and Babović 1983; Radovanović 1996a; Jovanović 2008). Even though novel elements such as pottery and polished stone artefacts appear during this time (Garašanin and

Radovanović 2001; Antonović 2006; Jovanović 2008), including the first migrants in the region (Borić and Price 2013), architectural and decorative traditions and mortuary practices are representative of further *in loco* development (*cf*. Srejović 1969; Radovanović 1996a), and the economy remained centred on hunting and fishing (Borić and Dimitrijević 2005; Živaljević 2017). First domestic animals (apart from dogs) were introduced only after c. 6000 cal BC (i.e. in the Early Neolithic) (Borić and Dimitrijević 2007), along with the establishment of new settlements and new forms of material culture within the gorges and in the downstream region (Bonsall 2008; Borić 2011).

Many cultural elements were wide-spread across the region of the Danube Gorges, suggestive of collective practices based on a shared habitus. However, the clustering of sites within particular features of the landscape along the Danube and certain variations in material culture lead Radovanović (1996a; 1996b; 1996c) to suggest that there have been three distinctive groups: the first one located in the Upper Gorge (the sites of Padina, Stubica, Lepenski Vir and Vlasac), the second group (or perhaps more groups) settled in the Lower Gorge and the Ključ area (the sites of Veterani Terrace, Hajdučka Vodenica, Răzvrata, Icoana, Ostrovul Banului, Schela Cladovei, Ostrovul Corbului and Velesnica), and the third one (which „split off" from the first one according to Radovanović) downstream from Ključ (represented by the sites of Kula and those at Ostrovul Mare) (Fig. 1).

Due to a multitude of discovered sites, the accelerated pace of rescue excavations, and a great number of scholars and institutions involved in them, the collection, curation, analysis and publication of the archaeological material had often been uneven and unsystematic. Moreover, archaeological teams working on opposite banks of the Danube seemed to have adopted somewhat different strategies (*cf*. Radovanović 1996a). On the Romanian, left side of the river there was a tendency to survey and document as much sites as possible, whereas research on the Serbian, right side has been mainly focused on systematic excavation of sites in the Upper Gorge, considered most representative in terms of settlement size and complexity, architectural features, sculptures and ornamented objects, and mortuary practices. Animal bones, considered of less importance at the time (*cf*. Dimitrijević 2008), were particularly subjected to unsystematic collection and uneven level of detail in publication. Consequently, despite the long tradition of research of the Danube Gorges context, a great number of publications, a high resolution of absolute dates and new analyses undertaken, some of the sites and/or types of material remain inadequately studied and published. In this paper, we focus on the downstream site of Kula, and present the results of the analysis of a small faunal assemblage which had been preserved and curated at the Archaeological Collection of the Faculty of Philosophy in Belgrade. Although the analysed sample represents only an arbitrarily saved portion of the original assemblage and is therefore biased, it offers important new insights into the spatial and diachronic variability in subsistence strategies, as well as into the use of animal bone, teeth, antler and shell in bodily decoration and artefact production. Moreover, the assemblage from Kula warrants attention, as it originates from one of the few sites with recorded Mesolithic-Neolithic sequences in the area downstream from the Danube Gorges, and is consequently of key importance in understanding various aspects of Early-Middle Holocene adaptations within this diverse landscape.

Archaeological background

The site of Kula was excavated in 1980-1984, as a part of the second large-scale rescue project prior to the building of the dam Iron Gates II (Sladić 1984; 1986; 2007). As previously noted, it is situated outside of the Gorges region in *sensu stricto*, in the lowland

landscape on the right bank of the Danube across the islet of Ostrovul Mare (Figs. 1-2). Over the course of the excavations, three sectors (c. 350 m^2) along the shoreline were explored, exposing several dwelling structures dug into the river terrace, stone-lined rectangular hearts and five burials. According to the principal investigator M. Sladić (1986, 2007), human occupation of Kula could be attributed to the regional Mesolithic and Early Neolithic, encompassing three distinct phases (Kula I-III), which were primarily distinguished on the basis of changes in soil colour and texture, architectural features, and the appearance of pottery in the two last phases. Similarly to some extent, other authors identified the Kula sequence as belonging to the Transitional Mesolithic/ Neolithic phase (Srejović 1988, 1989), i.e. spanning from the Late Mesolithic to the Early Neolithic (*cf.* Radovanović 1996a).

According to the excavator's (Sladić 2007) understanding of the chronology and stratigraphy of the site, the Mesolithic occupancy during the initial Kula I phase was primarily manifested by buildings. Two semicircular tent-like structures were discovered in trenches VI and VII in Sector I, and two large trapezoidal-base structures (buildings 1 and 3) were discovered in Sector III, in trenches 2 (sq. f29-30) and 1 (sq. e25-26, f26) respectively. The former were attributed to seasonal activities such as fishing, whereas the latter were associated with architectural traditions previously thought to be restricted to the Upper Gorge sites of Lepenski Vir and Padina. Similarly to their Upper Gorge counterparts, the buildings at Kula had large rectangular hearths. The one from Building 3 was made of split stones, and the Building 1 hearth construction included split stones and burnt clay, and had three ∀-shaped supporters. There were fairly few finds within the buildings, unlike the areas in their immediate vicinity where a great number of quartz flakes, a large stone boulder, bone and antler tools (including harpoons) and animal bones were found, indicating that they could have been used as open-air workshops (Sladić 2007; Vitezović 2011). In addition, three burials of adult males (1, 3 and 4) (Mikić and Sladić 1994) were assigned to this phase. The individual in Burial 1 was buried in a contracted position, with its head placed on a boulder and the body covered with split stones (Sladić 1984, 1986; Mikić and Sladić 1994). Burials 3 and 4 (Fig. 6) were found in the western periphery of the settlement; Burial 3 being partially disturbed by an Iron Age pit. Both bodies were in an extended supine position, with hands placed on the pelvis (Mikić and Sladić 1994; Sladić 2007), the dominant and most persistent feature in the burial ritual in the Danube Gorges Mesolithic (*cf.* Radovanović 1996a).

Sladić (2007) suggested that there was a hiatus following the abandonment of the Kula I settlement (*contra* Radovanović 1996a), on account that the architectural features and layers he attributed to the phase Kula II were lying on top of previous ones, without disturbing them. Remains of five burnt dwellings were attributed to this phase, mainly found in trenches IX, X, XI and XII in Sector I (buildings 4, 5, 6 and 7), and a single dwelling (Building 2) was found in Sector III (in squares f28-29). Their features could not be completely reconstructed due to intense burning, but it was suggested that they were most likely constructed in the wattle and daub technique; Building 4 and possibly 5 being rectangular in plan. Most of them contained hearths, but generally smaller in comparison to the ones from the buildings attributed to the previous phase. The hearths in buildings 2 and 4 were rectangular, made from stone slabs (the one in Building 2 was covered with a large pyramid-shaped stone block), and buildings 5 and 6 contained oval fireplaces. The tools associated with Kula II settlement resembled those from Kula I, namely in the preferred choice of raw material (quartz and antler). However, novel elements were also introduced, manifested by sporadic occurrences of pottery sherds (Sladić 1986, 2007).

The last phase Kula III was associated with a thin layer of dark reddish soil, with little evidence of human activity – namely concentrations of split stones, boulders, quartz pieces and antler fragments. A single obsidian flake was discovered in Sector III (sq. e25) (Sladić 2007), a fairly rare commodity whose nearest source was in the Carpathian mountains (Radovanović 1996a and references therein). There were also small amorphous pottery sherds, analogous to the ones from the previous phase. In addition, a single burial (5) had been associated with the latest phase of occupation. It belonged to an adult male, buried in a seated position with crossed legs, while its head was covered with split stones (Mikić and Sladić 1994, Sladić 2007). The absence of architectural features attributed to phase III have lead Sladić (2007) to hypothesise that the Kula riverine terrace was used only sporadically during this time, most likely as a fishing location.

The understanding of the continuity, duration and intensity of occupation at Kula has been hindered by the lack of absolute dates, as none were published up to date. However, AMS dating of animal bone samples has been underway, indicative of human presence on the Kula terrace as early as the Early Mesolithic (*cf.* Borić 2016. 117), i.e. between c. 9500-7400 cal BC. The later phase of this long temporal span has been characterised by the interment of several individuals in a seated position at Padina (Borić and Miracle 2004; Jovanović 2008), Lepenski Vir (Bonsall *et al.* 2015) and Vlasac (Borić *et al.* 2008; Borić and Price 2013), suggesting that Burial 5 from Kula could also be of Early Mesolithic date. In accordance with the presumed long-term use of the locale on the basis of archaeological evidence (Radovanović 1996a; Sladić 2007), other samples produced Late Mesolithic (c. 7400-6300/6200 cal BC) and Transformational Mesolithic-Neolithic (c. 6300/6200-6000/5900 cal BC) dates (Borić, *pers. comm.*). Various features of the material culture from Kula correspond to those from sites which have been intensely occupied during the Late Mesolithic. For example, circular tent-like structures attributed to Kula I have also been reported at Vlasac (*cf.* Srejović and Letica 1978), the oval hearths/fireplaces attributed to Kula II are reminiscent of those from Ostrovul Corbului and quartz and antler industries were prevalent at both sites (*cf.* Mogoşanu 1978; Beldiman 2007; Vitezović 2011). Also, on the basis of mortuary ritual (body position and grave goods, Fig. 6), burials 3 and 4 can probably be attributed to the Late Mesolithic. Rectangular hearths, however, represented a long-term feature in the Danube Gorges: during the Late Mesolithic they were most likely constructed in the open at Vlasac, and were consequently incorporated in the Transformation phase buildings at Lepenski Vir and Padina (*cf.* Srejović and Letica 1978; Radovanović 1996a; Borić 2007).

A Transformation phase date can be suggested in the case of buildings 1 and 3 from Kula, which were described as having a trapezoidal base by the excavator (Sladić 2007). As already noted, this particular architectural tradition flourished in the Upper Gorge, and was often associated with the striking landmark of the trapezoidal mountain Treskavac situated across the river from Lepenski Vir (Srejović 1969; Borić 2003, 2007), also seen from Padina and Vlasac. The occurrence of similar buildings at Kula could suggest that meanings attributed to this particular shape could have been transferred into a vastly different landscape, although there were also views that the exact characteristics of the Kula building floors could not be determined (*cf.* Borić 2003. 238). Nonetheless, apart from Kula, the ∀-shaped hearth supporters have only been reported in buildings from Lepenski Vir and Padina (*cf.* Srejović 1969; Jovanović 2008), suggesting that certain architectural elements from the Upper Gorge (and possibly, meanings ascribed to them) found their way into the downstream area of the Danube.

In addition, the period between c. 6300/6200-6000/5900 cal BC saw the emergence of

pottery, related to dwelling contexts at Lepenski Vir and Padina (Garašanin and Radovanović 2001; Jovanović 2008). No pottery vessels and/or fragments were reported in buildings at Kula, but a number of small sherds were found (mainly in Sector III) and attributed to the Kula II-III phases of occupation (Sladić 2007). Consequently, they could have been contemporaneous with the construction of trapezoidal buildings, or were possibly of later, Early to Mid-Neolithic date (c. 6000/5900-5500 cal BC). During that time, a number of new settlements were established in the Danube Gorges area, including those at Knjepište and Ušće Kameničkog potoka (Stanković 1968a, 1968b), in vicinity of Kula. This feature could have been associated with the diminished importance of the Kula locale during this time, although it was suggested that it still could have been used as a fishing spot (*cf*. Sladić 2007).

Consequently, the previous proposed periodisation is most likely in need of revision, but nonetheless the archaeological evidence from Kula suggests that this particular location has been in use in the long term – probably sporadically during the Early Mesolithic, and more intensely during the Late Mesolithic, Transformation phase, and possibly during the Early Neolithic (*sensu* Borić and Dimitrijević 2009). The faunal remains can therefore probably be associated with sporadic human visits in the earlier phases of the sequence, and in particular with later, prolonged periods of occupation.

The faunal sample, methodology and taphonomy

As previously noted, the faunal remains analysed within this study represent merely an arbitrary preserved sample of collected mammal and fish bones, whereas it might be hypothesised that the entire sample of mollusc shells had been saved. In addition, among the preserved animal bones a small collection of osseous artefacts and manufacture waste was found, which was not previously analysed (*see* Vitezović 2011) and was therefore included in this study.

Apart from a fairly small number of identified specimens (*see* Table 1), the hypothesis on the fragmentary state of the assemblage was corroborated by field documentation, referencing contexts with animal bones which were not encountered in the sample. This is due to the fact that the assemblage had been provisionally analysed by S. Bökönyi (*cf*. Sladić 2007. 13), a specialist mainly concerned with vertebrates (most notably, mammals) who was also involved in the analysis of other faunal assemblages from the Danube Gorges (*see* Bökönyi 1969, 1978, 1992) and had a habit of discarding them upon the completion of his work. In all fairness, the attitudes towards animal bones (considered of lesser importance at the time) and the accelerated pace of rescue excavations should also be emphasised (*see* Dimitrijević 2008), which additionally influenced the treatment of the archaeozoological material. Moreover, the standard archaeological practice at the time of excavation included mainly hand-collection of animal bone, suggesting that the remains of smaller mammals, fish, birds, reptiles, and amphibians were most certainly omitted.

The preserved faunal sample was analysed using the reference collection from the Laboratory for Bioarchaeology at the Faculty of Philosophy in Belgrade; in addition, relevant publications (Ložek 1964) were consulted for the identification and quantification of mollusc remains. Animal bones and mollusc shells were originally packed in bags namely designating the sector/trench/quadrant and excavation layer from which they originated, rather than their contextual and chronological provenance, and were consequently treated as a single unit in this study. The distribution of mammal, fish and mollusc taxa is expressed in NISP (number of identified specimens) and MNI (minimum number of individuals) frequencies, as well as by weight of their

respective remains (Table 1). However, the percentages and a further discussion on the relative frequency of taxa were not given due to the fragmentary state of the sample. The majority of mammal remains in the sample were heavily fragmented and weathered and consequently only a small number could be measured, whereas fish bones allowed for somewhat more measurements to be taken. Mammal bones were measured with 0.1 precision, following von den Driesch (1976). The measurements of fish bones and corresponding regression equations for size reconstruction have been undertaken after Živaljević *et al*. (accepted for publication) in case of sturgeon remains, and Radu (2003) in case of catfish remains. Due to poor preservation and fragmentation, it was also difficult to discern taphonomic traces and anthropogenic modifications, except for traces of manufacture and use in the case of occasional artefacts packed with animal bones. A small amount (c. 5.6%) of faunal remains were burnt, namely antler and bone fragments originating from a zone with burnt remains of wattle and daub in trench X of Sector I.

The faunal composition

The first brief account of animal taxa whose remains had been discovered at Kula had been given in a paper by Sladić (2007), on the basis of Bökönyi's preliminary report. Although the report itself including the quantification of faunal remains had not been saved, Sladić (2007. 13) notes that the identified taxa included wild game – red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*), and to a smaller extent forest-dwelling fur-bearing animals – wildcat (*Felis silvestris*), pine marten (*Martes martes*), badger (*Meles meles*), brown bear (*Ursus arctos*), red fox (*Vulpes vulpes*), wolf (*Canis lupus*), brown hare (*Lepus europeaeus*) and beaver (*Castor fiber*) (Table 1). Red deer remains were most prevalent in the sample analysed by Bökönyi, due to the animal's importance as a source of meat and raw material. More recently, a small collection of c. 50 osseous artefacts from Kula had been analysed by S. Vitezović (2011), showing a preference for red deer antler in tool making (Table 1). In addition, Bökönyi stressed the importance of fishing at Kula, predominantly oriented towards cyprinids (bream *Abramis brama* and carp *Cyprinus carpio*), anadromous sturgeons and freshwater sterlet (*Acipenser ruthenus*), and to a lesser extent towards pike (*Esox lucius*) and Wels catfish (*Silurus glanis*) (Table 1).

The preserved faunal assemblage included only a small number of mammal remains (NISP = 308), fish remains (NISP = 166), as well as the remains of gastropods and bivalves (NISP = 313) (the latter were not mentioned in Sladić's account of Bökönyi's analysis). Given the paucity of the sample, we have combined our data with that of Bökönyi and Vitezović (2011) in Table 1, in order to offer a most comprehensive list of taxa as possible, although this list is far from representative. Red deer remains were also prevalent in the preserved sample, most notably antler (including complete artefacts, fragmented artefacts and manufacture waste), which might be the reason they were not discarded after the analysis. One of the bags containing burr and beam fragments with traces of manufacture was labeled as „*Cervus*" (most likely by Bökönyi), which further supports this hypothesis. However, even though the prevalence of antler most certainly accounted for the overrepresentation of red deer in the preserved sample, other analysed faunal assemblages from sites in the Upper Gorge (*cf*. Bökönyi 1969, 1978; Clason 1980; Dimitrijević 2000, 2008; Borić and Dimitrijević 2005; Dimitrijević *et al*. submitted) and the Lower Gorge (*cf*. Haimovici 1987; Bartosiewicz *et al*. 1995, 2001; Greenfield 2008; Bălăşescu and Radu 2012) also suggest that this game animal was most commonly hunted. The majority of antler fragments and/or tools at Kula originated from zones with burnt wattle and daub in trenches IX, X and XI of Sector I, indicating that raw material deposition and tool manufacture took place in dwelling contexts.

Table 1. Mammal, fish, gastropod and bivalve taxa frequency expressed by the number of identified specimens (NISP), minimum number of individuals (MNI) and weight. Information on taxa marked with an asterisk (*) taken from Sladić (2007), after the report by S. Bökönyi. NISP value marked with a double asterisk (**) taken from Vitezović (2011. table 1), and represents the number of raw material/artefacts not analysed in this study.

Taxon		NISP	MNI	Weight (g)
Mammalia	*Castor fiber* , beaver	+*	/	/
	Lepus europeaeus , brown hare	1	1	4,0
	Canis lupus , wolf	1	1	7,1
	Canis familiaris , dog	3	3	40,3
	Vulpes vulpes , red fox	2	1	10,9
	Ursus arctos , brown bear	+*	/	/
	Martes martes , pine marten	1	1	3,0
	Meles meles , badger	+*	/	/
	Felis silvestris , wildcat	1	1	2,6
	Sus scrofa , wild boar	13	2	170,0
	Cervus elaphus , red deer	96 + 36**	4	1971,2
	Capreolus capreolus , roe deer	6 + 2**	1	58,9
	Mammalia indet.	184 + 9**	/	795,7
Pisces	*Acipenser gueldenstaedtii* , Russian sturgeon	11	1	34,4
	Acipenser ruthenus , sterlet	+*	/	/
	Acipenser stellatus , stellate sturgeon	2	1	1,0
	Acipenser sp.	6	/	21,2
	Huso huso , beluga	29	5	191,5
	Acipenseridae indet.	7	/	28,4
	Abramis brama , bream	+*	/	/
	Cyprinus carpio , common carp	+*	/	/
	Rutilus frisii , vyrezub	30	2	4,0
	Cyprinidae indet.	5	/	33,2
	Esox lucius , northern pike	1	1	2,3
	Hucho hucho , huchen	49	3	123,0
	Silurus glanis , Wels catfish	1	1	20,9
	Pisces indet.	25	/	22,5
Gastropoda	*Helix pomatia* , Roman snail	85	85	1061,4
	Arianta arbustorum , copse snail	3	3	5,7
	Cepaea vindobonensis , vineyard snail	50	50	129,7
	Gastropoda (land snails)	1	1	2,7
	Lithoglyphus naticoides , gravel snail	3	3	0,6
	Valvata piscinalis , European valve snail	7	7	0,7
Bivalvia	*Unio* sp.	162	91	780,6
	Veneroidea indet.	2	1	2,2

Apart from red deer, the remains of game animals included those of wild boar and roe deer (Table 1). A single roe deer mandible with mixed deciduous/permanent dentition was indicative of the kill season: on the basis of tooth eruption and wear it was determined that it originated from a 5- to 10-month old individual, i.e. that the kill season took place between September and February (*cf.* Tomé and Vigne 2003). A fairly small number of wild boar and roe deer remains can also be attributed to the paucity of the sample, however it is worth mentioning that these animals were generally hunted less often in

comparison to red deer, as manifested by their frequency in faunal assemblages from other sites in the Danube Gorges. The only exception is the site of Icoana in the Lower Gorge, where suid remains constituted the majority in the sample (Bolomey 1973).

The remains of fur-bearing animals in the Danube Gorges faunal assemblages generally attest to a great species diversity, but these are usually represented by a fairly small number of specimens (*cf*. Bökönyi 1969, 1978; Clason 1980; Haimovici 1987; Bartosiewicz *et al*. 1995, 2001; Borić and Dimitrijević 2005; Dimitrijević 2000, 2008; Dimitrijević *et al*. submitted; Greenfield 2008; Bălăşescu and Radu 2012), suggesting that they were hunted occasionally or opportunistically. At Kula, some of the taxa whose remains were identified by Bökönyi (i.e. beaver, brown bear and badger) were not encountered in the preserved sample. Only a small number of brown hare, wolf, fox, pine marten and wildcat bones were found, some of them bearing labels probably written by Bökönyi.

No remains of domestic animals were identified in the sample, apart from those of dog. There is strong evidence to support the hypothesis on the *in loco* domestication of dogs during the Late Mesolithic and perhaps even earlier (Dimitrijević and Vuković 2015; Bökönyi 1975). Dog remains in the preserved sample from Kula consisted solely of three right mandibles, one of them from an old individual with worn teeth. The absence of other, economically important domestic animals (i.e. cattle, sheep, goat and pig) could suggest that Kula was not occupied during the Early Neolithic, period that saw the establishment of new settlements at the nearby sites of Knjepište and Ušće Kameničkog potoka by communities practicing animal husbandry (*cf*. Bökönyi 1992; Stanković 1968b). On the other hand, as suggested by Sladić (2007), the long tradition of fishing at the Kula riverine terrace in the Mesolithic could have made it an attractive location during the Neolithic as well, even if these activities were only seasonal or sporadic at this time.

In what fishing is concerned, it is worth mentioning that the litoral landscape of Kula (Fig. 2) is strikingly different to the one in the upstream gorges. Prior to the construction of the dams, the section of the Danube flowing through the gorges was a swift river with numerous whirlpools and dangerous cataracts which channeled the movement of fish and detained them in the shallows. Consequently, such locations were utilised as best fishing spots in more recent times (*cf*. Petrović 1998 [1941]), and it is by no means a coincidence that the sites of Padina, Lepenski Vir and Vlasac in the Upper Gorge were located in vicinity of strong whirlpools. On the other hand, at the exit of the last, Sip Gorge, Danube transforms into a more tranquil, lowland river, but the downstream landscape also provided optimal fishing conditions. Apart from the vicinity of the Danube, the Kula riverine terrace was separated by a small stream called Plavinački potok, which grew stronger and more powerful during rainfall. Flowing into the Danube, the stream formed a small inlet and a whirlpool slightly upstream from its confluence, detaining fish brought about by the current (*cf*. Sladić 2007). This particular feature could have given rise to the establishment of a settlement at Kula, and possibly to the development of fishing techniques similar to those in the upstream gorges. A recent analysis by Villote *et al*. (2014) has shown that one of the individuals buried at Kula (albeit the burial number was not specified) displayed a developed external auditory exostosis (EAE) within the meatus of the temporal bone; a fairly common feature in the Mesolithic Danube Gorges associated with water-related activities.

Fish bones were fairly numerous in the preserved faunal sample from Kula, considering its fragmentarity. The vast majority of them originated from excavation layers 11-13 in trench IX of Sector I, however it remains unclear whether this spatial pattern would have been representative for the assemblage as a whole. A certain portion of it was certainly discarded after preliminary analysis, given that not all of

the taxa mentioned by Bökönyi were encountered in the sample. Namely, cyprinid remains were fairly few, and none of them could be attributed unequivocally to carp or bream, which were most prevalent according to Bökönyi (Table 1). The only cyprinid species that could be identified was vyrezub (*Rutilus frisii*), on the basis of its distinctive pharyngeal teeth. As a comparison, cyprinid remains constitute the majority in fish faunal assemblages from other Danube Gorges sites, in particular in assemblages collected by water sieving and flotation (*cf.* Bartosiewicz *et al.* 1995, 2001; Živaljević 2017; Dimitrijević *et al.* submitted).

On the other hand, sturgeon remains were fairly numerous in the sample, which corresponds to Bökönyi's data. As already noted, the majority of them (with the exception of freshwater sterlet) were previously identified only to the taxonomic level of family. No sterlet remains were found during our re-analysis; rather, all of the identified specimens originated from anadromous species, which used to migrate biannually (in spring and autumn) from the Black Sea: the beluga (*Huso huso*, Fig. 3, Kula p34/4, Kula p34/5, Kula p34/12, Kula p34/13), Russian sturgeon (*Acipenser gueldenstaedtii*, Fig. 3, Kula p34/6) and stellate sturgeon (*Acipenser stellatus*) (Table 1). Several beluga elements (*palatopterygoideum*, *maxillare*, *dentale* bones) which could be measured (*cf.* Živaljević *et al.* accepted for publication) originated from individuals ranging between c. 112 and 189 cm in total length (TL). This is in stark contrast with the data from the Upper Gorge sites of Padina, Lepenski Vir and Vlasac, where the average TL of caught belugas ranged between c. 200 and 350 cm, and largest specimens measured over 500 cm (Živaljević 2017; Živaljević *et al.* accepted for publication). A single measurable element (pectoral spine) of a stellate sturgeon found at Kula also belonged to a fairly small and young specimen, whose TL was estimated to c. 59 cm.

The remains of pike and catfish (less commonly exploited at Kula according to Bökönyi) were also encountered in the sample, represented by a single element respectively (Table 1). The catfish *parasphenoideum* (Fig. 3, Kula p34/1) originated from an individual whose estimated TL and weight were c. 293 cm and 168 kg (*cf.* Radu 2003. Annexe 4, Tableau 26). Whereas pike remains were generally few, the scarcity of catfish reported by Bökönyi is intriguing, given that the species is abundant in the Danube and its remains have been discovered on all sites in the Danube Gorges (*cf.* Nalbant 1970; Bökönyi 1992; Bartosiewicz *et al.* 1995, 2001; Păunescu 2000; Živaljević 2017). The greatest discrepancy with Bökönyi's data was reflected in a significant number of huchen (*Hucho hucho*) remains (namely vertebra - Fig. 3, Kula p34/9, Kula p34/10), as this salmonid species was not mentioned in the previous archaeozoological report (Table 1).

Finally, new information was gained by looking into the molluscan assemblage from Kula, which was not referred to in Sladić's account of Bökönyi's faunal report, and was probably entirely saved. With the exception of artificially modified specimens, mollusc remains from the Danube Gorges have generally received less attention, in particular in Bökönyi's work which was centred on vertebrate taxa (*see* Bökönyi 1969, 1978, 1992). More information on molluscs was provided in publications on faunal assemblages from Padina (Clason 1980), Vlasac (Dimitrijević *et al.*, submitted) and from sites on the Romanian, left bank of Danube (Pickard *et al.* 2017 and references therein). The assemblage from Kula contained the remains of gastropods - both land (the Roman snail *Helix pomatia*, copse snail *Arianta arbustorum*, vineyard snail *Cepaea vindobonensis*) and freshwater species (gravel snail *Lithoglyphus naticoides*, European valve snail *Valvata piscinalis*), as well as freshwater mussels (*Unio* sp., Fig. 4) (Table 1). The occurrence of molluscs in archaeological deposits may not be related to human activity, given that the natural habitat of all of these species is in the close surroundings of the site and they could have been deposited naturally. Also, they

could have been brought to the site unintentionally, for example over the course of fishing with nets or during the collection of building material from the river banks. However, some of them (e.g. *Helix* and *Unio*) could have been utilised as food for humans or animals and/or fish bait, i.e. intentionally collected by humans (*cf*. Clason 1980; Lubell 2004, Dimitrijević and Mitrović 2016; Stojanović and Obradović 2016; Pickard *et al*. 2017). This hypothesis seems plausible in the case of *Unio* shells, given that a great number of them bore damages on the anterior part of the valve (Fig. 4b-d), probably resulting from opening with some kind of tool. It was also suggested that *Unio* shells from the sites of Padina (Clason 1980. 168) and Schela Cladovei (Pickard *et al*. 2017) were used as food/fish bait, however those were broken at the posterior end of the valve. Similar breakage patterns on the posterior end have been observed on *Unio* shells from the Neolithic site of Drenovac (Stojanović and Obradović 2016), and their dietary use was also suggested at the Neolithic site of Vinča (Dimitrijević and Mitrović 2016); both in the Central Balkans. Apart from these modifications, two *Unio* valves from Sector III (one of them found in the context of Building 2) at Kula bore artificial perforations; similarly modified specimens have also been reported at Schela Cladovei (Pickard *et al*. 2017). *Unio* shells are most commonly collected in July and August, and it can be done by hand during the periods of low water level (Dimitrijević and Mitrović 2016 and references therein).

In addition, several shells in the sample could not be attributed to freshwater malacofauna. All of them were found in Trench IX of Sector I – four valves (one of them shown on Fig. 5a) were found in the 13th excavation layer, and a single valve (Fig. 5b) in the 17th excavation layer. Valve size and shape is somewhat reminiscent of freshwater *Corbicula fluminalis*, however their thickness suggests that they are most likely marine. Given their poor preservation and eroded edges, it could only be concluded that they are equivalves with a heterodont hinge, i.e. that they belong to the numerous superfamily of marine clams and cockles (Veneroidea indet.). The occurrence of various marine mollusc specimens in the Danube Gorges is indicative of long distance exchange networks throughout the temporal sequence. *Cyclope neritea* shells appear as early as the Epipalaeolithic at Cuina Turcului (Grossu 1970; Păunescu 1970; Mărgărit 2008; Mărgărit *et al*. 2017). These shells (and occasionally *Columbella rustica*) were commonly used as personal ornaments during the Mesolithic, as manifested by the occurrence of perforated specimens in burials at Vlasac and Schela Cladovei, and at Ostrovul Banului (Srejović and Letica 1978; Mărgărit 2008; Cristiani and Borić 2012; Borić *et al*. 2014; Mărgărit *et al*. 2017; Pickard *et al*. 2017). The Early Neolithic saw the introduction of a new type of ornament, made from *Spondylus* shells (Srejović 1969. fig. X; Borić *et al*. 2014; Pickard *et al*. 2017). The specimens from Kula, however, bore no visible traces of artificial modification. Furthermore, such specimens have not been reported at any of the Danube Gorges sites up to date, and may represent yet another marine shell species traded over long distances.

Animal remains from burial contexts

As previously noted, few faunal remains could be associated with well defined contexts (i.e. building features and hearths), which hinders our understanding of activity zones within the settlement and patterns of deposition. In several instances, however, they were associated with particular burials, and consequently provide insights into possible meanings attributed to animals from which they originated and their relationship with the human body.

A fragmented dog mandible was found in the bag containing finds from Burial 1 (an adult male buried in a contracted position), which could suggest that it was intentionally deposited with the deceased. Structural deposition of dog remains in funerary contexts

was also practiced at Late Mesolithic Vlasac, where a headless (otherwise articulated) dog skeleton was found next to the feet of a female individual (Burial 81), and an isolated dog mandible was placed on the chest of a male individual (Burial 25) (Srejović and Letica 1978; Radovanović 1999). Also, articulated dog skeletons and/or their parts have been reported in Transformational phase buildings at Lepenski Vir (Bökönyi 1969; Dimitrijević 2008), occasionally in association with humans: remains of a dog were placed next to burials 54d-e in Building 65/XXXVI (Srejović 1969. 138), and a dog mandible was found with disarticulated human remains (Burial 70) in Building 36 (Stefanović and Borić 2008. note 6). According to Radovanović (1999), dogs could have been held in special regard due to their liminal position as „neither person nor beast" – i.e. they were the only animals closely related to human settlements, sharing food and possibly domestic space with humans. Moreover, the choice of dog mandibles (as a „metaphor" for the animal itself, *cf*. Radovanović 1999) might not have been accidental. For example, morphological changes resulting from the domestication process - shortening of the jaws and overcrowding of the teeth (*cf*. Bökönyi 1975; Dimitrijević and Vuković 2015) could have signaled these „new" kinds of animals. In addition, due to the ambiguous nature of the dog, their mandibles might have „slipped" occasionally into the role occupied by human mandibles, which were also often structurally deposited (Živaljević 2015).

Another kind of human-animal relationship, and the relationship with a different kind of domain seems to be emphasised in the case of burials 3 and 4, two adult males buried in a supine position. In previous publications (Sladić 1986, 2007; Radovanović 1996c) it was mentioned that the individual in Burial 4 was buried with a stone boulder, an antler tool, quartz flakes and cyprinid pharyngeal teeth, and the individual in Burial 3 with two quartz tools. Their position in relation to the bodies of the deceased could be seen on field sketches and photographs (Fig. 6), and the bag containing grave goods has been saved, which allowed us to examine the cyprinid teeth and the antler tool in more detail. The antler tool (Fig. 6d) was found next to the left arm of the individual in Burial 4, and it represents one of the most common types of artefacts from Kula, identified as "chisels" (*cf*. Vitezović 2011). It was made from a cylindrical segment of an antler tine, cut at the base and flattened, whereas the working edge had been broken. Burial 4 contained 28 cyprinid teeth in total (the majority of them shown on Fig. 6f), mainly found in the pelvic region of the deceased (Sladić 2007. 28), but according to the bag, label four of them were situated around the skull, and one next to the knees. In addition, two more teeth were labeled as finds from Burial 3 (Fig. 6b), but their position had not been specified. On the basis of size and morphology, it was determined that all of them originate from anadromous *Rutilus frisii* (vyrezub). The species' migration into the Danube from the Black Sea had not been recorded in historic times, but its presence in the Danube Gorges in the Early-Middle Holocene has been recently confirmed by aDNA analysis (Živaljević *et al*. 2017). Modified *R. frisii* teeth have also been found in 24 burial contexts at Vlasac (Živaljević 2017; in press; *see also* Srejović and Letica 1978; Borić 2003. Appendix 6; Borić *et al*. 2014), in a single burial at Schela Cladovei and Icoana (Mărgărit *et al*. 2017), as well as in three dwelling contexts (buildings 35, 43 and 65) at Lepenski Vir (Živaljević 2017; in press). Recent use-wear and residue analyses (Cristiani and Borić 2012; Cristiani *et al*. 2014; Mărgărit *et al*. 2017) have shown that they were worn as garment appliqués suspended by sinew threads, tied around the perforation in the frontal part of the tooth neck, or coiled around both perforated and unperforated teeth by red ochre binding compounds. Moreover, their distribution in relation to the human bodies suggests that they were attached to some sorts of cloaks placed on the backs of the deceased,

and possibly to headdresses (Cristiani and Borić 2012). This arrangement is strikingly reminiscent of the distribution of pearl-like tubercles on the bodies of spawning *R. frisii* males, a phenomenon which occurs during their spring migration to rivers and which could have been simulated by humans wearing teeth embroidered clothing (Živaljević 2017; in press). On the basis of dated burials and architectural features (*cf.* Borić *et al.* 2008, 2014; Borić and Dimitrijević 2009) containing teeth appliqués, this ornamental tradition can be traced between c. 6800 and 6000 cal BC, i.e. the to the latter phases of the Late Mesolithic and the Transformation phase.

The pharyngeal teeth from burials at Kula were also modified in a similar fashion, suggesting that they were originally attached to garments and possibly headdresses. The neck on preserved specimens had a jagged fracture, which suggests they were extracted from the pharyngeal bone by flexion or percussion (*cf.* Cristiani and Borić 2012; Mărgărit *et al.* 2017), probably while the bones were still fresh. Both specimens from Burial 3 and 16 out of the 28 from Burial 4 were perforated at the tooth neck (the rest were too fragmented to identify the perforation). However, unlike the numerous specimens from Vlasac and the majority of those from Schela Cladovei, no reddish ochre concretions were observed, but rather a blackish colouring on the junction of the tooth neck and globular body (Fig. 6b, f). Specks of similar colour were observed on a few specimens from Schela Cladovei, and interpreted as traces of charcoal inclusions in the binding compound (Mărgărit *et al.* 2017). Given that the vast majority of teeth appliqués originated from Vlasac, it might be hypothesised that there was a special relationship between this Upper Gorge community and schools of migrating vyrezub, embodied in attires possibly reserved for particular members of the society or kinship groups. Nonetheless, at least on some occasions, these decorative items or persons wearing them found their way into the downstream locations of Icoana, Schela Cladovei and Kula, possibly with somewhat varying techniques of appliqué suspension.

Osseous tools and bones with traces of artificial modification

In addition to the modified *R. frisii* teeth and the antler tool from Burial 4, the preserved sample contained osseous artefacts and manufacture waste from non-burial contexts as well (mainly from zones with burnt wattle and daub in trenches IX, X and XI of Sector I). The vast majority of them was made from red deer antler, including types described by Vitezović (2011) in her analysis of the osseous tool assemblage from Kula. Most numerous were chisels (five complete and six fragmented), which were made from cylindrical segments of antler tine by cutting at the basal part, smoothing the surface, and by oblique cutting to form a working edge (Fig. 7, Kula 21/2 and Kula 42/2). Complete artefacts displayed a polished working surface as well as traces of use in the form of lines and striations. Similar artefacts have also been found at Vlasac, Hajdučka Vodenica and Ostrovul Corbului, and were interpreted as woodworking tools (Vitezović 2011 and references therein). Other types described by Vitezović, and present in the artefact assemblage analysed within this study included a puncher made from tine, a fragmented burnisher made from beam, and a small, burnt fragment of what was most likely a harpoon (Fig. 7, Kula 02/2). Antler harpoons represent a fairly rare type of tool in the Danube Gorges Mesolithic, and the most representative pieces have been found at Vlasac (Srejović and Letica 1978. table LVII, XCIII) and Kula (Sladić 1986, 2007; Vitezović 2011). The two previously published specimens from Kula were two barbed (one of them with two asymmetrical rows of barbs along the sides, and the other with a sharp, barbed point), meticulously executed from a beam segment (Vitezović 2011. figs. 7-8). Both were found within the concentration of animal bones and artefacts next to Building 3 in

Sector III. The specimen Kula 02/02 had a single barb preserved, which could suggest that the tool was single-barbed, or perhaps bore asymmetrical barbs. It was also found in Sector III (square e18), jointly with small pottery fragments. Given their small number and careful execution, harpoons might have been associated with particular persons or status, e.g. successful fishers or hunters (*cf.* Vitezović 2011). In addition, the antler artefact assemblage analysed within this study contained other two types of tools which did not occur in the assemblage analysed by Vitezović. Three specimens consisted of cylindrical beam segments, cut just above the burr and flattened on the basal end in order to create a broad working surface; similar artefacts have been discovered at Vlasac and interpreted as "axes-hammers" (*cf.* Srejović and Letica 1978. tables LI, LXXXVII). A single antler tool, made from a tine tip with a trimmed basal end, resembles a number of antler points found at Vlasac (Srejović and Letica 1978. table LXXXIII).

Similarly to the assemblage analysed by Vitezović, bone artefacts were much fewer in the preserved sample. Two metatarsal bones (of red and roe deer respectively) were split longitudinally, with traces of manufacture along the edges. The only tool in the sample was a broken point/awl with a massive handle, made from ungulate long or metapodial bone. Its tip was coloured black, possibly from the organic material on which it had been used. Finally, a single boar tusk tool (Fig. 7, Kula 20/1) found in a concentration of daub in trench X of Sector I represents a unique find from Kula, given that such artefacts had not been previously reported from this site (*cf.* Vitezović 2011). On the other hand, they were abundant at Vlasac (Srejović and Letica 1978; Borić *et al.* 2014), and were also found at Alibeg, Veterani, Ostrovul Banului, Răzvrata, Icoana, Schela Cladovei, Ostrovul Mare (Boroneanț 1999), Padina, Hajdučka Vodenica (Jovanović 1969) and Lepenski Vir (Srejović and Babović 1983). It was suggested that these tools could have been used in fish processing (Srejović and Letica 1978; Borić 2003) – the sharp tip for splitting fish open, and the handle/cutting edge for scaling. The specimen from Kula only had the rectangular handle preserved, with traces of use (dents and striations) on one side, whereas the tip had been broken off.

Discussion and conclusions

As previously discussed, the preserved faunal sample could not provide means for a well-grounded quantification or a detailed spatial and contextual analysis, and the potential for studying taphonomic traces, seasonality and biometric data was limited. Nonetheless, the assemblage from Kula warrants attention, as it originates from one of the few sites with recorded Mesolithic and Transformation phase sequences in the area downstream the Danube Gorges. A detailed re-analysis enabled us to cross-reference the evidence from Kula (however biased) with other published archaeozoological reports on sites situated in different parts of the landscape, i.e. the steep and narrow Upper and Lower Gorge, and to infer on potential differences in food resource exploitation strategies. Also, it enabled us to examine diachronic changes in food resource exploitation in the lowland downstream region by comparing the assemblage from Kula to those from settlements in its vicinity established during the Early Neolithic, whose inhabitants practiced animal husbandry along with hunting and fishing (*cf.* Stanković 1986b; Bökönyi 1992).

Namely, despite of its fragmentarity, the mammal faunal sample is reminiscent of the faunal assemblages from other Mesolithic sites in the Danube Gorges, i.e. it is indicative of subsistence strategies oriented towards red deer hunting, followed by roe deer and wild boar. Red deer was most certainly hunted for its meat, as well as a source of raw material for tool production. The presence of dogs and their occasional special treatment is another shared feature in the Danube Gorges Mesolithic, possibly rooted in their ambiguous

status of animals which were part of human society. Similarly to other settlements, the role of fishing at Kula must have been great, given the choice of settlement location, the occurrence of tools possibly used in fishing and fish processing, and the quantity of fish bones in the sample. The choice of exploited fish species, however, shows certain dissimilarities with other ichthyo-archaeological assemblages – namely in the prevalence of huchen and fairly small sturgeons, and in the modest number of cyprinid and catfish remains. However, given the fragmentary nature of the sample, observed fishing strategies may be more apparent than real. Given that vyrezub remains in the sample consist solely of modified pharyngeal teeth found in burials, it remains unclear whether this particular species was exploited for food as well, or perhaps the ornaments were brought to the site from another location. Another distinctive feature of the faunal assemblage from Kula is manifested in the fairly large number of mollusc remains, with evidence of *Unio* shells being processed for their meat and occasionally perforated, as well as evidence of long-distance exchange of marine shells. Given the optimal season for collecting *Unio* shells and the occurrence of remains of migratory sturgeon and vyrezub, it might be hypothesised that the settlement at Kula had been occupied from early spring to late autumn, although a single pike vertebra and a roe deer mandible suggest possible winter occupation as well.

Consequently, the results presented here are a further testimony to the interrelatedness between various micro-regions within the Mesolithic Danube Gorges. Namely, Radovanović's (1996a, 1996b, 1996c) hypothesis on the connection between the Upper Gorge (via Danube and also via the Miroč plateau land route), manifested by similarities in architectural features and patterns of mortuary practice, are further supported by the presence of similar decorative elements (the vyrezub teeth). On the other hand, particular fishing practices (aimed at huchen and smaller sturgeon) and the emphasis on shellfish gathering could have represented specific features of the downstream region, although the evidence is limited. This lowland and open landscape proved to be more suitable for animal husbandry starting from the Early Neolithic, and yet the location of Kula continued to be in use, most likely due to its long-term importance as a fishing spot.

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Figure 1. Map of the Danube Gorges region showing the location of Kula and other relevant Epipalaeolithic, Mesolithic and Early Neolithic sites referred to in the text.

Figure 2. The site of Kula during excavation, view from the Danube (photo from the field documentation of M. Sladić).

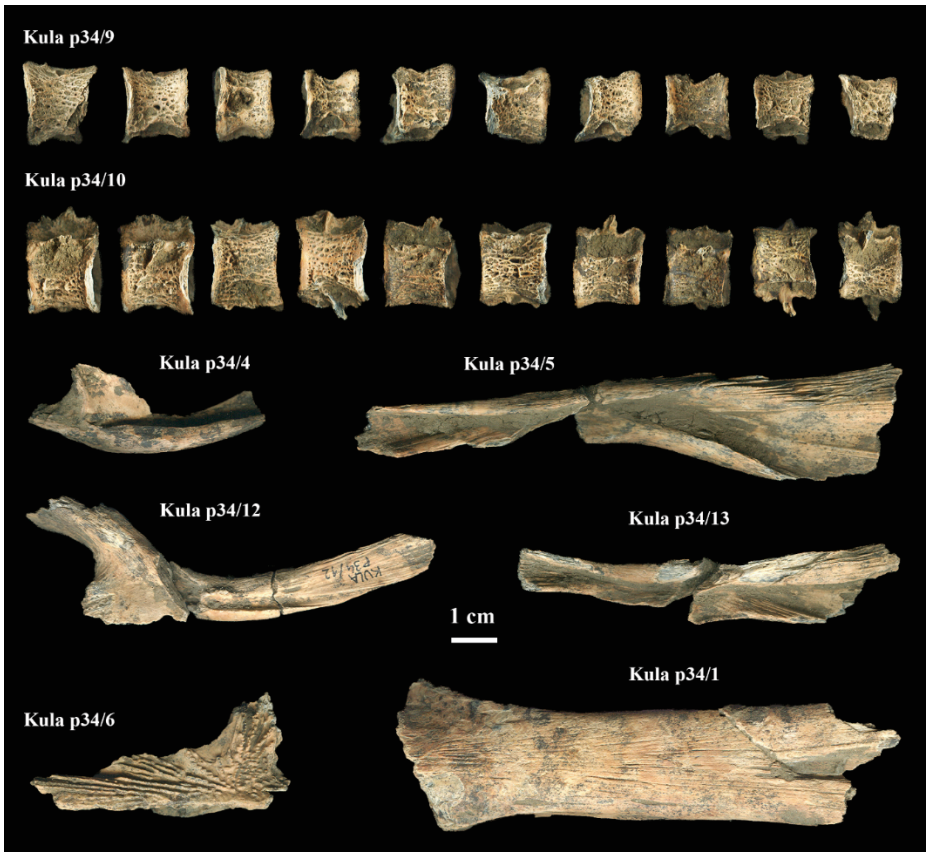

Figure 3. Fish remains from Kula: huchen (*Hucho hucho*) abdominal and caudal vertebra (Kula p34/9 and p34/10), beluga (*Huso huso*) *maxillare* (Kula p34/4 and p34/12) and *dentale* bones (Kula p34/5 and p34/13), Russian sturgeon (*Acipenser gueldenstaedtii*) *jugale* (Kula p34/6) and Wels catfish (*Silurus glanis*) *parasphenoideum* (Kula p34/1).

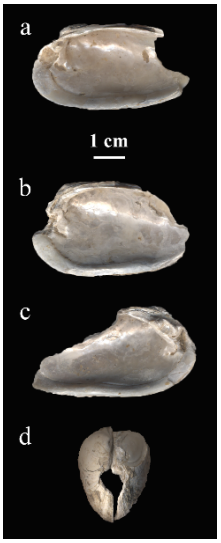

Figure 4. *Unio* sp. shells from Kula: a) right valve with anterior part intact; b-d) right and left valve of the same individual with anterior part damaged, probably as a result of opening.

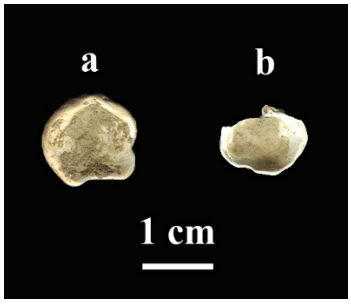

Figure 5. Marine bivalves (Veneroidea indet.) from Kula (Kula 44 and Kula 68).

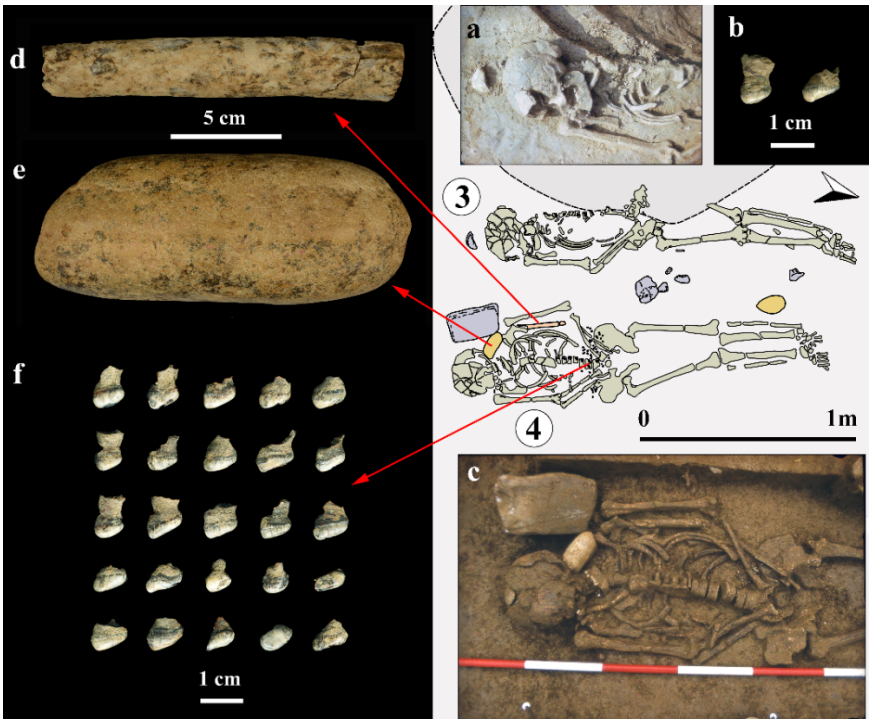

Figure 6. Burials 3 and 4 with associated grave goods and personal ornaments (digitalised by J. Pendić after field sketches). a) detail of Burial 3 (photo from the field documentation of M. Sladić); b) vyrezub (*Rutilus frisii*) pharyngeal teeth (Kula p09/1) from Burial 3 (unspecified location); c) detail of Burial 4 (photo from the field documentation of M. Sladić); d) antler tool (chisel?) (Kula 10/1) from Burial 4, placed beside the left arm of the deceased; e) boulder from Burial 4, placed on the left shoulder of the deceased; f) vyrezub perforated and fragmented pharyngeal teeth (Kula p10/1), mainly found in the pelvic region of Burial 4.

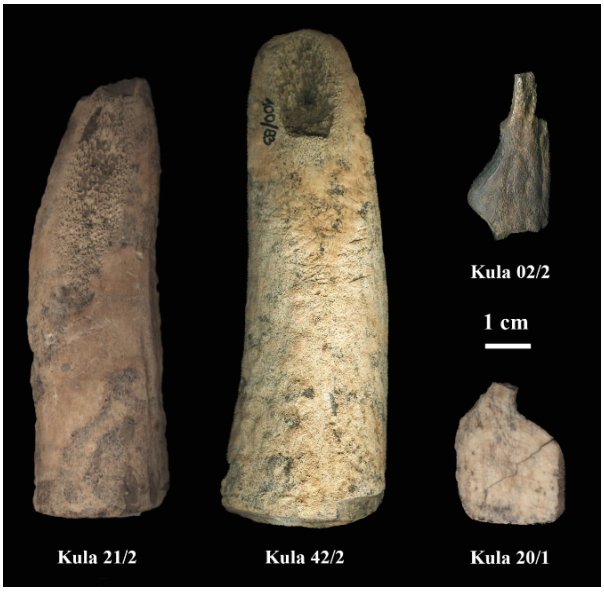

Figure 7. Osseous tools from Kula: antler chisels (Kula 21/2 and Kula 42/2), antler harpoon fragment (Kula 02/2) and a fragmented boar tusk cutting edged tool (Kula 20/1).