

POPULATION DYNAMICS AND CULTURAL CHANGES IN THE EARLY UPPER PALAEOLITHIC OF THE CENTRAL BALKANS

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Abstract: Recent investigations in Serbia and Montenegro have filled the gap in our knowledge of the Middle and Upper Palaeolithic in the Balkans providing us with a better understanding of the factors which influenced the appearance of the earliest Upper Palaeolithic techno-complexes in this region. In contrast to the east Balkans, the continuity between Middle and Upper Palaeolithic do exist when it concerns the inhabiting of primary ecological zones but it could not be followed when technology and settlement pattern are concerned. The dating of Šalitrena cave has revealed that Vindija cave can no longer be regarded as an isolated example of the late Neanderthal occupation in the west of the Balkans and that there are strong possibilities that Neanderthals survived in the western Balkans and the interior of the Dinarides somewhat longer than in other parts of the peninsula. We posit that the volcanic eruption before 40 ka which resulted in the Campanian Ignimbrite (CI) tephra deposition, could have had a more significant impact on the Adriatic zone where Middle Palaeolithic population density was the greatest, but had no long-term effect in the northeast part of the peninsula. We suggest that there was a temporal trend in the spread of the Upper Palaeolithic from the east to the west of the Balkans and that the Danube corridor had a significant role in its distribution. We dispute statements that the CI tephra covered the Upper Palaeolithic at several sites in the central Balkans and call into question the conclusion that there was evidence for the existence of Upper Palaeolithic communities in this area before the eruption.

1 INTRODUCTION

The south Carpathian region and the eastern Balkans hold enormous potential for the study of the Middle to Upper Palaeolithic transition in Europe. Very early evidence for the appearance of anatomically modern humans (Trinkaus *et al.* 2003) and their material culture (Tsanova 2008; Sitlivy *et al.* 2012) including cave art (Ghemış *et al.* 2011) have recently been reported for northern Bulgaria and southwestern Romania., while very late remains of Neanderthals at Vindija cave confirm longer-lasting coexistence of Neanderthals and modern humans in the Balkans (Higham *et al.* 2006). Still, the mod, pathways, and tempo of this expansion of modern humans into Europe remain unsolved, and the question of interactions between the Neanderthals and modern humans remains. The reason for this rests partially on the fact that until recently the central Balkan region had not been thoroughly investigated and so it was not possible to connect phenomena in the east and the west of peninsula. Recent Palaeolithic investigations in Serbia and Montenegro are beginning to fill the gap in our knowledge of the nature and timing of the Middle to Upper Palaeolithic transition. Here we examine to what extent this newly gathered information could contribute towards a more thorough comprehension of cultural changes and population movements in this period.

2 MIDDLE PALAEOLITHIC AND UPPER PALAEOLITHIC SITES: REGIONAL OVERVIEW

Until recently, the Middle Palaeolithic of Serbia could only be discussed on the basis of finds from Risovača where a Middle Palaeolithic industry with leafpoints was excavated in the 1950s (Gavela 1988). Of Upper Palaeolithic sites there was only Crvenka-At with a rich assemblage of Aurignacian finds was gathered in the 1960s and early 1970s (Mihailović 1992). Some attempts to resurrect Palaeolithic research in Serbia were made in the 1980s but the decisive breakthrough occurred only around decade ago with the investigations of Petrovaradin Fortress in Vojvodina (Mihailović 2009a), followed by more systematic surveys and both small and large-scale excavations in a number of caves and rock-shelters in east and west Serbia (Mihailović 2008; Mihailović *et al.* 2011).

The course of Palaeolithic research in Montenegro followed a somewhat different trajectory. Very soon after excavations commenced at Crvena Stijena in the mid-1950s it was soon recognized that this site was one of key sites in the region, with cultural deposits exceeding 20 meters and encompassing over twenty Palaeolithic horizons (Basler 1975). Mališina Stijena rock-shelter was excavated in the 1980s (Radovanović 1986) and produced several Middle Palaeolithic horizons, while Bioče cave - excavated in the 1990s - produced a large number of Middle Palaeolithic artifacts (Đuričić 2006). However, neither site has been published in detail and comprehensive technological analyses of artifacts from Crvena Stijena has only recently been completed. Excavations at Crvena Stijena and Bioče have been recently resumed (Baković *et al.* 2009; Derevjanko *et al.* 2012). The industry from layer X at Crvena Stijena was until recently considered to have Aurignacian connections (Benac, Brodar 1958, Basler 1975), but subsequent analyses revealed that such a determination is not reliable (Mihailović 2009b).

In the course of excavations in the area of Petrovaradin Fortress, located high above the right Danube bank of the Danube, we have excavated over one thousands of Middle Palaeolithic artifacts. In this industry mostly based on quartz as a raw material, the Taubachian-Charentian is the most prevalent component, although there are Levallois artifacts as well as backed sidescrapers of somewhat larger size (Mihailović 2009a).

Levallois artifacts were also confirmed in the assemblages gathered at Kozluk near Vršac (Radovanović 1984) and in Zemun, near Belgrade, underneath loess profiles on the bank of the Danube (Šarić 2008).

On the fringe of the Vršac depression, the Crvenka and at complex produced thousands of Upper Palaeolithic artifacts from sand layers (**figure 1**). The industry has homogeneous characteristics and could be ascribed almost completely to the Aurignacian, although a small number of artifacts reveal either Middle Palaeolithic or Gravettian characteristics (Mihailović 1992, Mihailović *et al.* 2011). The Crvenka assemblages consists of artifacts characteristic of the Krems group, including pyramidal bladelet cores, conical endscrapers and few Dufour bladelets, but the elements of Typical Aurignacian nosed and carinated endscrapers *etc.*) are also present. Dihedral burins, carinated and pointed endscrapers, and large sidescrapers are characteristic of the At assemblages, coupled with a somewhat greater incidence of Middle Palaeolithic elements. At the nearby site of Balata, the assemblage was characterized by lower frequencies of Aurignacian elements and a more prominent Middle Palaeolithic (Levallois) component.

Investigations in eastern Serbia have been undertaken in the Iron Gates region and in the Timok and Nišava river basins. Two Palaeolithic horizons have recently been identified at Tabula Traiana cave in the Iron Gates (Borić *et al.* 2012). Several artifacts of Middle Palaeolithic type were found in layer 206, while in layer 207, dated broadly to 41.300 to 34 500 cal BP (bones with cut marks in 34 200 ± 550 BP and 33 450 ± 500 BP), one thick bilaterally retouched blade and one marginally retouched bladelet have been recorded. While ibex remains prevail among the fauna in the Upper Palaeolithic, there were numerous remains of carnivores including cave lion, cave hyena, cave bear, brown bear, wolf, lynx and fox.

An almost identical situation has been encountered in nearby Baranica situated on the bank of Trgoviški Timok (Mihailović *et al.* 2011). Only a very few quartz artifacts were found in layer 4c, while in layer 4a/4b, dated to 35 780 +/- 320 BP (OxA – 13 828), we found flakes, three unretouched blades, endscrapper on thick retouched blade and an atypical carinated endscrapper on a massive retouched flake (**figure 2**). The variety of raw materials used in the manufacture of the artifacts, and the fact that ready-made tools had been brought to the site, confirms that the cave had been used as transitory station. This is also indicated by the bones of carnivores (hyena in particular), which were found in large quantity in the Upper Palaeolithic layers (Dimitrijević 2011), confirming regular breaks in human occupation.

In contrast to the northern part of eastern Serbia where many Upper Palaeolithic sites were recorded, in the southern part of this region, we identified numerous sites with Middle Palaeolithic industries and no early Upper Palaeolithic. In the Balanica cave complex, near Niš, the remains of *Homo erectus* s.l. have been identified (Roksandić *et al.* 2011) dated to 392 to 525 ka (Rink *et al.* 2013). In Balanica we have also identified Charentian layers (Mihailović 2008) which probable date from the Middle Pleistocene. In Pešturina cave, situated in adjacent Jelašnica, layers representing at least two Middle Palaeolithic occupational phases have been recorded: a Charentian assemblage in the lower layer, and a Denticulate Mousterian assemblage in the upper layer. Overlaying them is the layer with artifacts, which probably belong to the Gravettian or early Epigravettian (Mihailović, Milošević 2012). The Middle Palaeolithic was also documented at many other sites in eastern Serbia, both those known from previous investigations, such as Golema Dupka (Prekonoška cave) near Svrljig and Pećurski Kamen near Sokobanja (Mihailović *et al.* 1997), as well as those excavated recently with S. Kuhn, such as Milušinačka cave and Sokograd rock-shelter near Sokobanja and Selačka cave near Knjaževac.

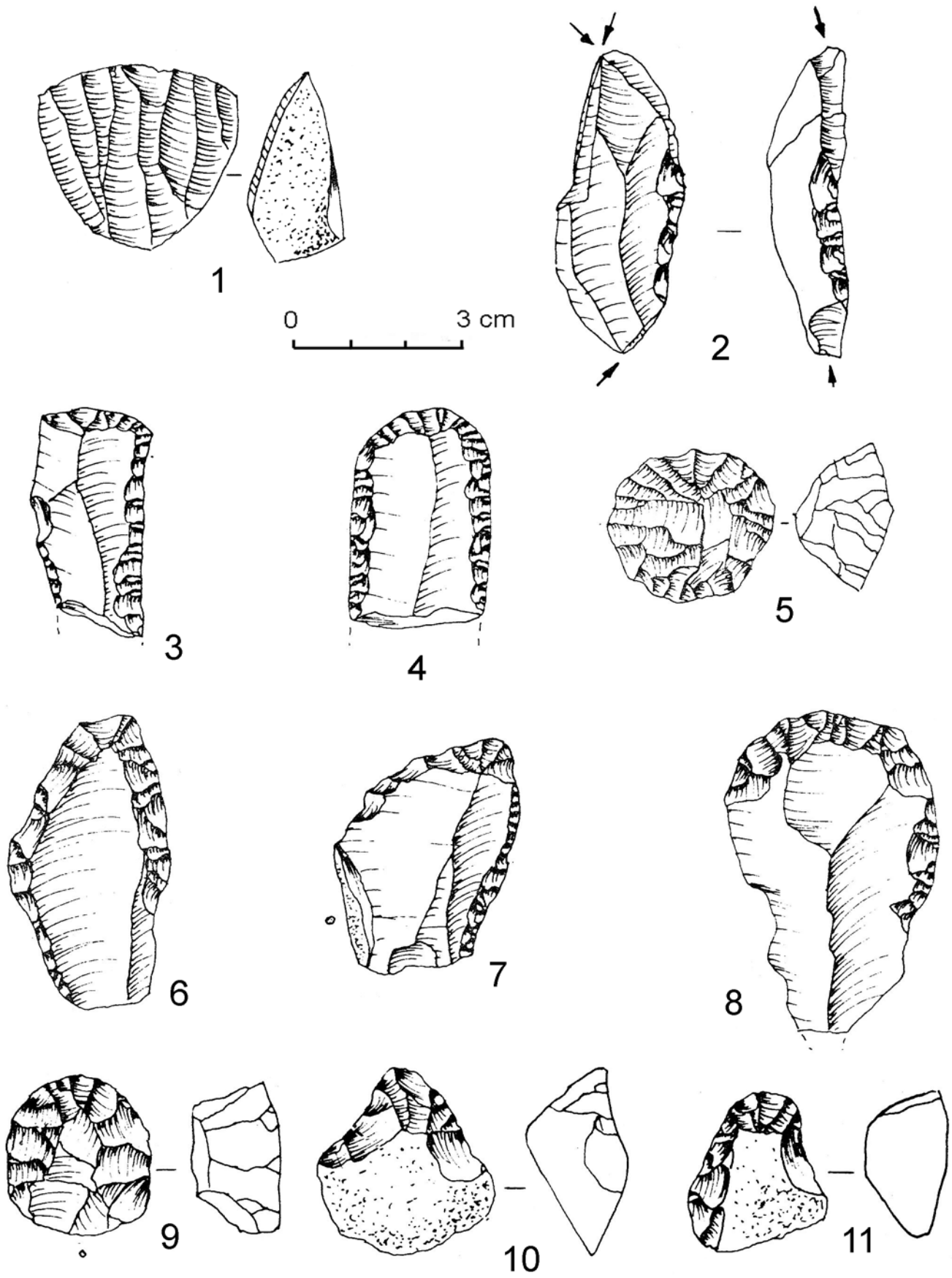


FIGURE 1 Stone artifacts from Crvenka-At.

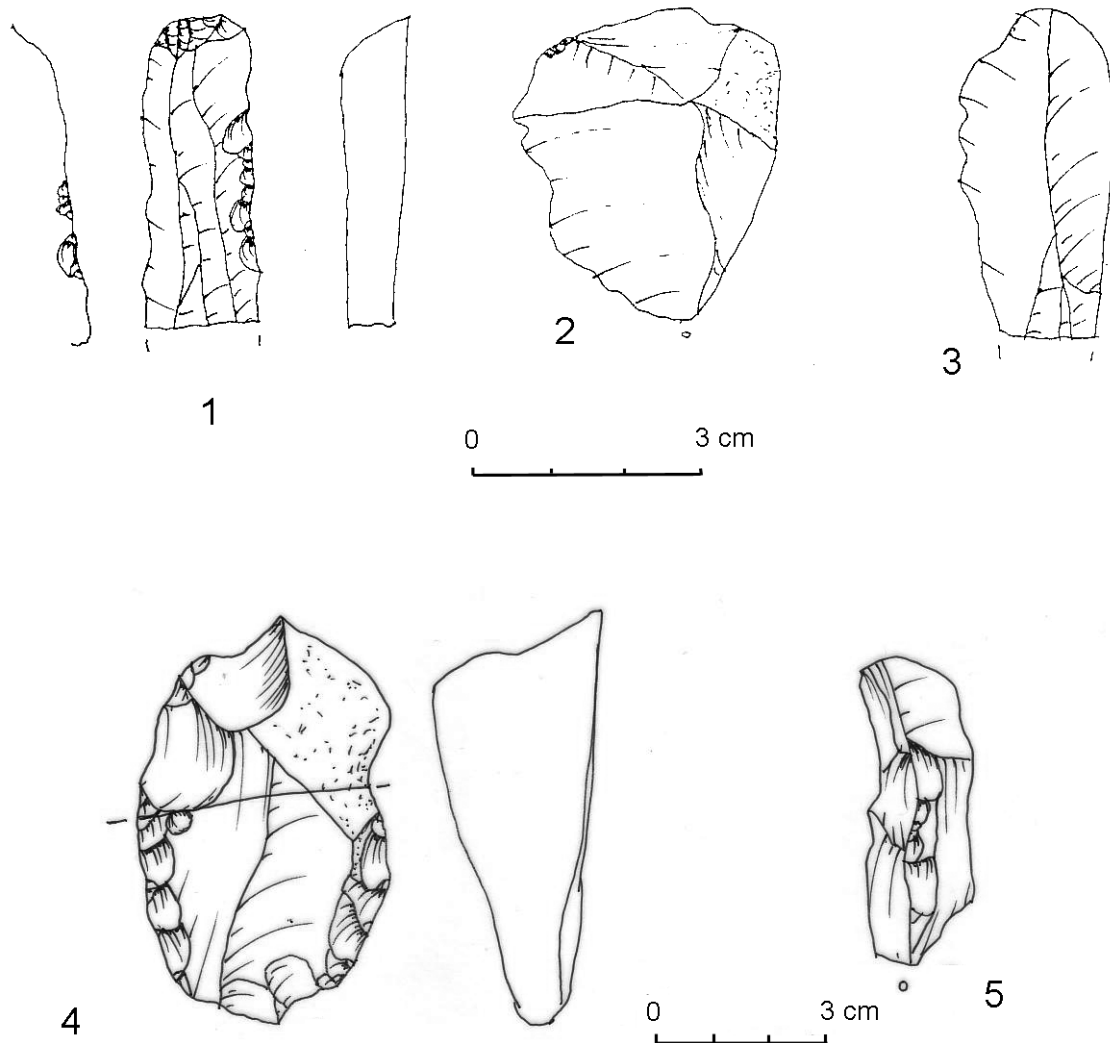


FIGURE 2 Stone artifacts from Baranica.

In western Serbia, Šalitrena cave has been focus of excavations for the last years. The most substantial part of the site sequence belongs to the Upper Palaeolithic, although there are Middle Palaeolithic layers (Mihailović & Mihailović 2009). Relatively young dates (37 990 +/- 750 - Beta 237 686; 37 760 +/- 520 BP - Beta - 237 690) were obtained for the Middle Palaeolithic layers 6a–6d. The Middle Palaeolithic toolkit consists of Levallois flakes produced by the preferential method, atypical Mousterian points (one elongated and two made on irregular flakes), sparse lateral sidescrapers and denticulated artifacts. The Aurignacian layer (5) was dated to 31–32 ka (31 980 +/- 360 BP - Beta - 237 688; 30 190 +/- 400 BP - Beta - 224 720). It consisted of a large number of wedge-shaped and burin-like cores and typical carinated endscrapers and burins. There is also a moderate quantity of retouched blades, lateral sidescrapers of somewhat larger size and denticulated tools, while plain endscrapers and burins are relatively less frequent. The larger blades with deep semi-steep retouch were only recorded in the cave interior.

No Upper Palaeolithic sites have been confirmed so far in central and south parts of western Serbia. In the course of systematic site survey, conducted in 2010–2012 in the Western Morava valley, we identified over 30 Middle Palaeolithic open-air sites (Mihailović, Bogosavljević-Petrović 2009).

Levallois artifacts were encountered at most sites, while sidescrapers (except at site Samaila) are very infrequent. In Hadži Prodanova cave, Levallois artifacts were recorded only in lower layers (5b–5c) which, judging by the present micro-fauna (Bogićević 2008) probably belong to MIS 5a or MIS5c. Quartz artifacts and lateral sidescrapers of Middle Palaeolithic type (Mihailović & Mihailović 2006) were found in layers 5a and 4. The remains of carnivores prevail in the cave (of cave bear and wolf in particular) while remains of ibex predominate among the prey animals (Milošević 2010). In Smolučka cave, situated in the far southwest corner of Serbia, were encountered sparse Levallois and quartz artifacts and the remains of cave bear along with remains of ibex, chamois, red deer and wild cattle or bison prevail among animal bones (Kaluderović 1985; Dimitrijević 1997). The lower layer of the cave is radiocarbon dated to > 38 000 BP (Hedges *et al.* 1990).

In the mountainous area of northern Montenegro, to the southwest of Smolučka cave, many rock-shelters have been investigated. At Mališina Stijena many Mousterian artifacts have been encountered in layers dated to > 38 000 BP, and among them were very few artifacts of Upper Palaeolithic type (Radovanović 1986, Hedges *et al.* 1990). At Crvena Stijena, situated in southwest Montenegro, layer XII has been radiometrically dated to $40\,777 \pm 900$ BP, and immediately underlies an *in situ* exposure of the Campanian Ignimbrite (CI) tephra (Morley & Woodward 2011) – dated to 40 ka and according to sedimentological analyses possibly belonging to MIS 3 (Morley 2007). In this layer there is a very distinct industry with a high proportion of utilized cores and ad hoc tools (mostly denticulated) on small and asymmetrical “débordant” flakes and pseudo-Levallois points. Levallois specimens are present, while Upper Palaeolithic artifacts are atypical and present in only small quantity. Raised retouched blades and one semi-abrupt retouched point were identified in the assemblage, but diagnostic Aurignacian tools have not been recorded (Mihailović 2009b). As far as Bioče is concerned, a Middle Palaeolithic industry similar to the one at Crvena Stijena was confirmed at that site but it seems that Mousterian types of tools (lateral sidescrapers, points and Levallois artifacts) are more frequent (Đuričić 2006; Derevjanko *et al.* 2011).

3 QUESTION OF CONTINUITY BETWEEN MIDDLE AND UPPER PALAEOLITHIC

Two or three types of Mousterian industries were actually in use in the time preceding the appearance of the Upper Palaeolithic in Serbia and Montenegro. The first group includes industries of the Typical Mousterian, which has a long tradition in the Balkan Peninsula, appearing in eastern as well as in western Serbia. The Mousterian of western Serbia, which is territorially connected with the Mousterian found in northern Bosnia, includes a more dominant Levallois component - which is logical if we bear in mind the frequency of high quality radiolarite occurring in the limestone rocks of the Inner Dinarides. On the other hand, Denticulate or Micro-Mousterian of the Adriatic-Ionian zone is mostly characterized by expedient technology based on the production of ad hoc tools manufactured from low quality raw material. Its appearance was probably the consequence of reduced mobility/territoriality in MIS3 although other factors could not be disregarded. Finally, Denticulate Mousterian in the Balkans interior (Pešturina), judging by the low frequency of typical denticulated tools (but also the occurrence of the Levallois), could also be characterized as taphonomic/economic rather than cultural facies (Thiéabaut 2010). In contrast to neighboring Bulgaria the industries of “transitional” type like Bohunician or Bachokirian have not been confirmed at any site in Serbia and Montenegro (except eventually at Balata).

Chronological overlapping of the late Middle Palaeolithic in the west of the Balkans and early Upper Palaeolithic in the east has so far not been confirmed at the regional level. At Šalitrena cave there is a 6 000 years gap between the Mousterian and the Aurignacian, while Middle Palaeolithic layers at Baranica and Tabula Traiana cave have so far not been dated. Nevertheless, it should be borne in mind that radiocarbon dating of layers from that period is fraught with considerable problems (Blockley *et al.* 2008; Jöris *et al.* 2011). Layer 207 at Tabula Traiana cave spans a period of time equivalent to around 7000 years (Borić *et al.* 2012), so the fact that bones with cut marks are dated to 34–35 ka does not guarantee that artifacts also date from the same period. The CI microtephra reported as being found throughout layer 207 (Borić *et al.* 2012) is also contradictory to the claim that the same CI microtephra covers the Upper Palaeolithic layer at this site (Lowe *et al.* 2012). Different dates were also obtained for Middle Palaeolithic layer 3 in Pešturina, so only a new program of absolute dating (^{14}C , OSL, ESR) allied with systematic microstratigraphic analysis of the stratigraphical sequence allow these problems to be overcome (Alex *et al.* 2012). A similar situation has also been confirmed at other sites in the Balkans, e.g. in Temnata and Vindija (Drobnowicz *et al.* 2000, Janković *et al.* 2011) and until more high-resolution geochronology and microstratigraphic analysis are undertaken at these sites there is a considerable impediment to the drawing of far-reaching conclusions about the Middle to Upper Palaeolithic transition in the region.

The impoverished lithic assemblages from Tabula Traiana cave and Baranica do not provide the grounds for a precise cultural attribution, while industries from Crvenka-At and Šalitrena cave undoubtedly belong to the Aurignacian. Material from Crvenka and At is very similar to the material from sites in Romanian Banat (to such an extent that we could speak about the Banat group), but as it is also the case with the Romanian sites it could be rather related to the Aurignacian of the Krems type than to the Proto-Aurignacian (Sitlivy *et al.* 2012). The industry from Šalitrena (dated to 31–32 ka) certainly also originates from the Middle Aurignacian, and considering the frequency and variability of carinated endscrapers and burins it is more similar to the Aurignacian of the middle Danube basin (Hahn 1977; Svoboda 2006) than the Aurignacian of northern Bosnia (Basler 1979).

There are also differences when we consider settlement pattern and systems of raw material procurement. Although Middle Palaeolithic and Upper Palaeolithic populations inhabited the same geographical area and visited the same habitations the settlement pattern in these two periods was essentially different. The Neanderthal communities inhabited not only low lands but also mountainous regions of the Carpatho-Balkanides and the Dinarides, and they often used techno-economic model based on the curation of flint tools and the production of expedient tools of quartz. Such a model appears very early (in Mala Balanica) and it has been confirmed at most of the later sites: in Hadži Prodanova cave, in both layers of Pešturina and in Smolučka cave. In contrast to this, Upper Palaeolithic communities rarely inhabited so-called marginal zones and stayed in caves for short periods of time using mostly flint-made tools. Only future investigations will show whether populations in the Upper Palaeolithic were concentrated in river valleys and low lands, and whether their settlements could actually be associated with a logistical type of mobility.

4 ADVANCING OF THE UPPER PALAEOLITHIC AND WITHDRAWING OF THE MIDDLE PALAEOLITHIC

Regardless of doubts concerning the stratigraphy and chronology of sites, recent investigations indicate that there is an evident trend in the expansion of the Upper Palaeolithic from the east toward the west of the Balkans. If we are to draw isochrones between ^{14}C dated sites in the region (**figure 3**) we will see that the Upper Palaeolithic spread diffusely in a wave-like movements, but also that the Danubian corridor was really the main communication for advancing of Upper Palaeolithic groups (Conard & Bolus 2003). The impression of the importance of this corridor is additionally supported by the fact that there are no reliably identified Upper Palaeolithic sites dating between 30 ka and 40 ka in the Dinarides and along the coast from the Peloponnesus to the north Italy (Mihailović 2009b). At many sites in that region either only Mousterian has been identified or there is a habitation gap from the Mousterian to the Gravettian.

The trend towards the retreat of the Middle Palaeolithic differs only slightly. In the east of the Balkans and along the coast the Middle Palaeolithic lasted until before 40 ka and in Šalitrena cave survived until 38 ka, while the Neanderthals in Vindija remained until before 32–33 ka (Higham *et al.* 2006). All this suggests that Middle Palaeolithic was withdrawing westward and that there is the possibility that the western - and perhaps also central part of the peninsula - represented a Neanderthal refugium when the Upper Palaeolithic appeared in the Danube basin. On the other hand, considering that the Middle Palaeolithic came to an end around 40 ka at Mujina cave, Crvena Stijena and Asprochaliko (Basler 1975; Rink *et al.* 2002, Runnels & van Andel 2003) where there was no Aurignacian, the question could be asked how the volcanic eruptions of the Phlegraean fields and Heinrich Event 4 influenced those processes. It is not impossible that the impact was great in the coastal zone and it is particularly conspicuous at Crvena Stijena where deposits of tephra reach a thickness of 10–20 centimeters (Morley & Woodward 2011). It is however difficult to assume that this eruption left long-lasting consequences in the north of peninsula behind the barrier created by the Dinaric mountain range. This is also indicated by ^{14}C dates obtained from Bulgarian sites, that even if we leave aside perplexities related to the earliest dates definitely reach the age of 38–39 ka (Tsanova 2008).

No little confusion has been added to these problems by recent results of microtephra analysis according to which the start of Upper Palaeolithic habitation of some cave sites precedes deposition of CI microtephra (Lowe *et al.* 2012). This question deserves more detailed discussion but even in this stage it could be concluded that the evidence from at least two (of the four) suggested sites is not valid: a) we already described the situation in Tabula Traiana cave above, while b) the claim that in Golema Pesht, Macedonia, the microtephra overlies an Upper Palaeolithic layer is not correct as layer 3 yielded no confirmed diagnostic artifacts but only quartz finds, which are much more difficult to attribute (Salamonov-Korobar 2008). If we add the possibility that material from layers 6/7 at Kozarnika is postpositional mixture (Tsanova 2008), we arrive at the conclusion that in the Balkans only the Uluzzian of Klissoura precedes the accumulation of microtephra with some certainty (Kuhn *et al.* 2010; Lowe *et al.* 2012).

We do, however, agree with the assumption that modern humans proved “a greater competitive threat to indigenous populations than natural disasters” (Lowe *et al.* 2012), at least where northern parts of the Balkans are concerned. The monotonous succession of the Middle and Upper Palaeolithic and shifting of borders of advancement without any evidence of interactions bear witness not only to ecological, but also to social competition between the Neanderthals and modern humans (Mihailović 2004).

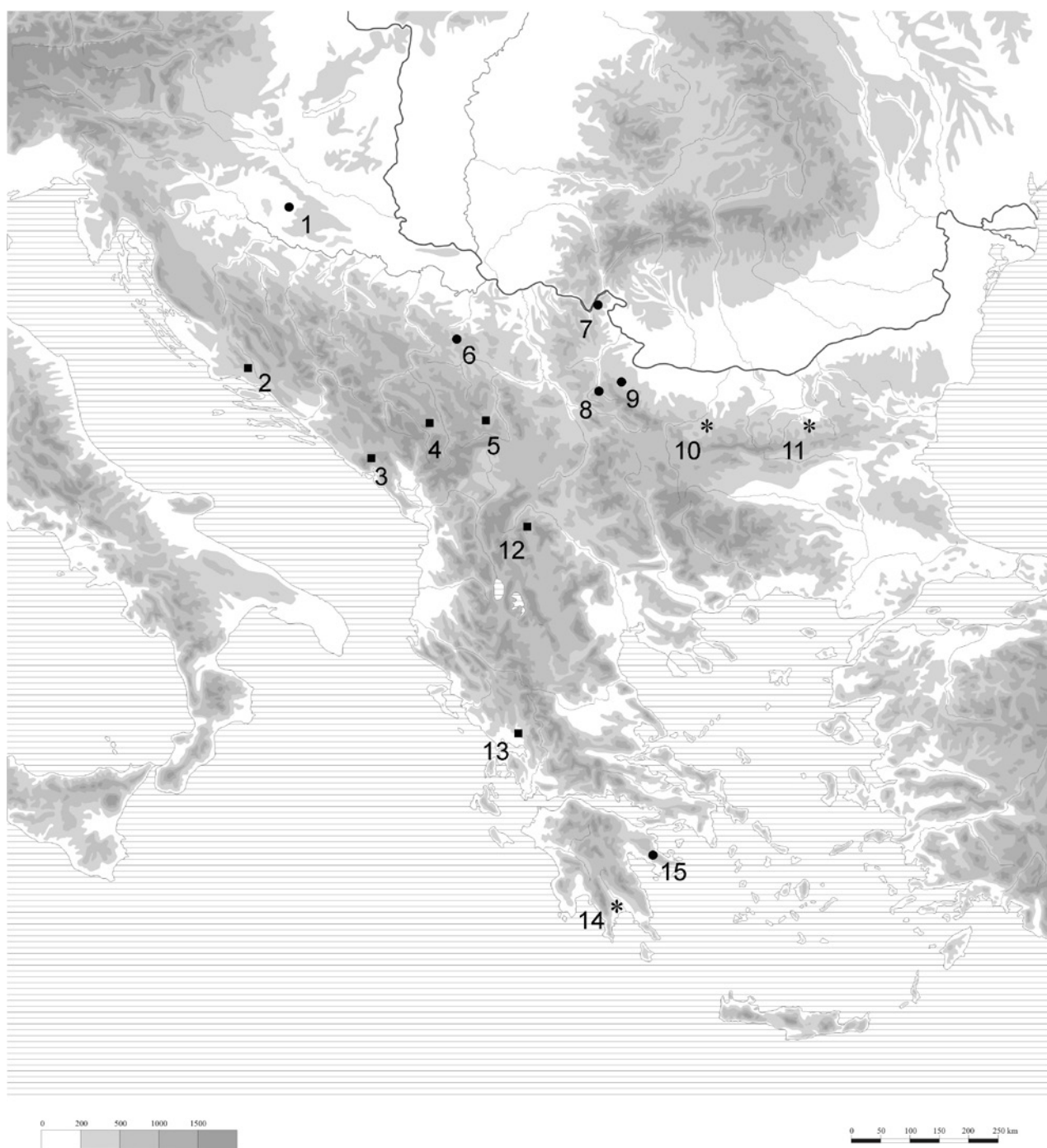


FIGURE 2 ¹⁴C dated Late Middle Palaeolithic sites (■), Middle and Early Upper Palaeolithic sites (●), and sites with "transitional" industries (*), mentioned in the text: 1. Vindija; 2. Mujina cave; 3. Crvena stijena; 4. Mališina stijena; 5. Smolucka cave; 6. Šalitrena cave; 7. Tabula Traiana cave; 8. Baranica; 9. Kozarnika; 10. Temnata; 11. Bacho Kiro; 12. Golema Pesht; 13. Asprochaliko; 14. Lakonis; 15. Klissoura.

It is quite possible in this context that social factors also had a considerable impact on the low level of hybridization between the Neanderthals and modern humans. On the other hand it is not easy to establish the degree of cultural interactions with the newcomers considering problems in the interpretation of sites (Bacho Kiro, Vindija, Kozarnika, Lakonis) where human remains and archaeological finds were encountered in association (Churchill & Smith 2000; Tsanova 2008; Harvati *et al.* 2009). Possibilities of the coexistence of two populations could be tested if future investigations are carried out in the territory along the borders and possible directions of advancement of the Upper Palaeolithic communities (including the Sava valley). The results of the analysis of material from the rock-shelter Mezzena in north Italy also suggest that such coexistence was possible (Longo *et al.* 2012).

5 CONCLUSION

The bearers of Middle and Upper Palaeolithic industries in the Balkans inhabited the same geographic area and primary ecological zones, but differences in technology, distribution and settlement pattern suggest that these were different populations. Whether the bearers of changes were anatomically modern humans and whether transitional industries from Temnata and Bacho Kiro and Uluzzian from Klissoura could (eventually) be related to the Neanderthals remains an open question. Yet, what new investigations in the region have revealed is that there is a temporal trend in the spread of the Upper Palaeolithic from the east toward the west of the Balkans as well as the fact that there is a strong possibility that Neanderthals survived in the western Balkans and in the interior of the Dinarides somewhat longer than in other parts of the peninsula. It could be expected that current investigations will very soon provide the answer to the questions we have posed in this work. If in the southern regions, in the interior of the Dinarides and in the coastal zone, we encounter sites from the initial phases of the early Upper Palaeolithic the suggested scenario of settling in the Balkans at the transition from the Middle to the Upper Palaeolithic will have to undergo certain changes.

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