

Abstracts

The Middle and Upper Palaeolithic in the western Mani peninsula, an exceptionally rich palaeolithic landscape within the south of Peloponnese (S. Greece)

Andreas Darlas¹, Eleni Psathi²

¹*Ephoreia of Paleoanthropology and Speleology of Northern Greece, Greek Ministry of Culture, Navarinou 28, 55133 Kalamaria, Thessaloniki, Greece*

²*Ephoreia of Paleoanthropology and Speleology of Southern Greece, Greek Ministry of Culture, Ardittou 34b, 11636 Athens, Greece*

Along the west coast of Mani peninsula numerous caves are opened. Most of them contain fillings dating to the Upper Pleistocene and to the Early Holocene with cultural remains from the Middle Palaeolithic to the end of the Neolithic period. Therefore they form an extremely important assemblage of archaeological sites located in limited geographically range.

Previous research in Apidima cave had yielded, among other palaeolithic finds, two human crania belonging to early Neandertals. The first systematic palaeolithic excavation has been conducted in the neighbouring Kalamakia cave between 1993 and 2006 and has yielded rich Middle Palaeolithic material from a thick Upper Pleistocene stratigraphic sequence. This excavation has been the first step towards the realization of a broader systematic research project, which is currently in progress: in parallel with the above excavation, since 1998 the exploration of the karstic cavities on the west Mani coast has been carried out. Over 50 cavities have been recorded. Based on preliminary data, 6 sites have been selected for test pits: Melitzia, Tripsana, Skoini 3, Skoini 4, Kolominitsa and Kastanis. They have yielded Upper Palaeolithic and Neolithic layers (several samples dated with ¹⁴C/AMS are already available). However, (with the exception of Tripsana) the above test pits have not reached the bottom of the fillings. The cave of Melitzia has been chosen for a systematic excavation (carried out since 2009).

The hitherto main findings of the research project can be summarized as follows:

Although there is no doubt that the caves in western Mani coast had been occupied since the Middle Pleistocene, earlier evidence has been “erased” by the successive marine transgressions of interglacial periods until the time of OIS 5e.

Since the end of the last interglacial and especially during OIS 4, the marine regression revealed an extremely important number of caves, which have been used by the Neandertal inhabitants of the peninsula, and also in some cases by different carnivore species.

The excavation of Kalamakia cave, through a filling several meters thick, has yielded 17 occupation layers, which suggest that the cave had been periodically used either as a residential camp or as a short term/hunting base. Several various types of hearths, and stone "constructions" on the occupation floors offer examples of the use of the cave. The lithic industry is a typical Middle Palaeolithic marked by the intensive application of the Levallois method. Rich macro- and microfauna offer paleoclimatic data and evidence of the subsistence strategy of the cave inhabitants: during the first half of the Upper Pleistocene, climate remained in general relatively mild, although cooler and drier than today. The vegetation was Mediterranean, but adapted to the above climatic conditions. Fallow deer (*Dama dama*) and ibexes (*Capra ibex*) were the main game animals, while land tortoises have also played an important role to the human diet. Finally, this site has yielded the largest to date collection of Neandertal remains in Greece.

During the second half of Upper Pleistocene, in the Upper Palaeolithic sites the following can be observed: Based at least on large mammal study, from OIS 4 to OIS 2 the biodiversity has decreased and oscillations of the frequency of some species have been recorded (i.e. progressive decrease of *Dama* and inversely increase of *Cervus*). At the same time, the systematic exploitation of smaller mammals and other animal species, like birds, is recorded.

First evidence points to an exploitation model of the broader territory by nomads, marked by the combined use of both long and shorter term sites, probably hunting bases.

All sites have yielded Gravettian/Epigravettian lithic industries rich in backed microblades, while Kolominitsa cave has also yielded Aurignacian layers. Raw materials present different frequencies from one site to another. During the new period, hematite appears for the first time and it is omnipresent. Finally, several samples of tools/arms, but also ornaments made by bone, antler and teeth of large mammals have been uncovered.

Lately, the ongoing trial excavation of Kolominitsa cave revealed Middle Palaeolithic layers below the Aurignacian horizon, thus offering for the first time in western Mani peninsula the possibility to observe and describe the transition from the Middle to the Upper Palaeolithic.

The above described research project has already produced very encouraging data for its continuation and generally the exploration of the Palaeolithic in Southern Greece. Already, preliminary data prove the importance of the systematic research in local scale, through the comparative study of neighboring and contemporaneous sites, and also the possibility to date precisely the arrival of anatomically modern humans in the above area and the subsequent ecological and cultural changes.

Anatolia on the route for early dispersals? The Lower and Middle Paleolithic record of Turkey

Berkay Dinçer¹, Ludovic Slimak², Steve Kuhn³

İstanbul Üniversitesi Edebiyat Fakültesi Prehistorya Anabilim Dalı, İstanbul, Turkey.

²*CNRS, UMR 5608, TRACES, Université de Toulouse le Mirail, Maison de la Recherche, 5 Allées Antonio Machado, 31058 Toulouse Cedex 9, France.*

³*Department of Anthropology, P.O. Box 210030, University of Arizona, Tucson, AZ 85721, USA.*

Due to their geographical position between Africa and Eurasia, Anatolia and Thrace (modern Turkey) have always been considered as a major route for early hominin dispersals. However, this is not a homogeneous landscape, but a vast region with various climatological and geographical sub-regions. It was also a challenging area for both biological and cultural adaptations. If Anatolia was in fact a major route for hominins coming from Africa into Europe, it was also the first area where they had to face cold and long winters. Thus Anatolia was not necessarily an easy route for African hominins dispersing to Europe, and to assume that underestimates the region's potential influence on the adaptations of Paleolithic hominins.

More than 400 Paleolithic sites have been reported in Turkey but just a handful have been investigated in detail, much less subject to modern systematic excavations. In general, excavated Paleolithic sites in Turkey are so few in number and so far away from each other that for the moment it is not possible to draw firm conclusions about the role of Anatolia in the earliest occupations of Balkans and Europe. Thus theories claiming Anatolia as a passage between Africa and Europe remain preliminary for the moment. However, results do at least show the presence of hominins in Anatolia at various times, as well as the presence of diverse lithic traditions in different areas. Rather than looking like a simple crossroads, Anatolia and Thrace seem to have been home to diverse local populations and cultural evolutionary histories.

Dursunlu and Kaletepe Deresi 3 (KD3), two of the most ancient excavated sites in Turkey, are located on the high plateau of Central Anatolia. Dursunlu is dated to 0.78-0.99 million years ago. Only a small number of artifacts were recovered at Dursunlu: these consist of simple flakes and cores of quartz, flint and other materials. KD3 is located near to the Göllü Dağ obsidian sources. It is an open-air site composed of nearly 7 meters of archaeological sequences. The basal Acheulean levels, lying on top of a 1-million-year-old bedrock, contain large tools such as bifaces and cleaver flakes, and the technology is suggestive of a Middle Acheulean age. In the Middle Paleolithic levels of KD3, some of which date to before 160 ky, nearly all artifacts are made of obsidian, and Levallois is the dominant production process. Intensive systematic survey around the nearby obsidian sources also reveal a robust Acheulean and Middle Paleolithic (Levallois Mousterian) presence in the region. These studies show that pre-Acheulean, Acheulean and Mousterian hominins were able to survive at high elevations on the Anatolian plateau, although we do not currently know whether the various sites were occupied during glacial or interglacial periods.

Karain Cave, located in southwestern Anatolia, close to the Mediterranean, is the richest and longest studied Paleolithic sequence in Turkey. The stratigraphic sequence composes a series of occupations from Lower to Upper Paleolithic, and shows a very different cultural sequence than the central Anatolian sites. The main character of the basal levels is Tayacian, not Acheulean. In Middle Paleolithic levels Proto-Charantian, Charantian and Karain-type (Balkan) Mousterian are represented.

Yarımburgaz Cave is located in eastern Thrace near Istanbul. Paleolithic occupation of the cave is limited to a single cultural horizon, in which stone tools are closely associated with remains of cave bears that died during hibernation. Hominin occupation of the cave dates to the late middle of Middle Pleistocene. Lithics are mainly retouched flake tools, with some core tools (choppers/chopping tools), although these latter are not very abundant. Consistent with other southeastern European sites there is no evidence of bifacial technology at Yarımburgaz. Surveys on Thrace also reveal surface sites with choppers and flake tools but so far no clear Acheulean.

**The Lower and Middle Palaeolithic in Romania Dealul Guran, Peștera
(Constanța County):
The first Lower Paleolithic site in Romania**

**Adrian Dobos¹, Radu Loviță², Kathryn Fitzsimmons³, Ulrich Hambach⁴, Alexandra Hilgers⁵,
and Anja Zanders⁵**

¹*Department of Paleolithic Archaeology, Institute of Archaeology "Vasile Parvan" Bucharest,
Romania*

²*MONREPOS Archaeological Research Centre and Museum for Human Behavioural Evolution,
RGZM, Neuwied, Germany*

³*Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology,
Leipzig, Germany*

⁴*Chair of Geomorphology, University of Bayreuth, Germany*

⁵*Institute for Geography, University of Cologne, Germany*

Background

Southeastern Europe represents a key area in investigating hominin dispersals during the Pleistocene. A good understanding of these phenomena is however hampered by the scarcity of data, especially for the Lower and Middle Pleistocene.

The research on the Lower Paleolithic in Romania has overrated the importance of the discoveries assigned to this period. They mainly consisted of pebble tools found in secondary contexts, which have no cultural marker value. Moreover, the anthropic origin of many of them was doubtful.

Our presentation focuses on the Lower Paleolithic site of Dealul Guran (Guran Hill), discovered in 2010 during a systematic survey carried out in the province of Dobrudja, southeastern Romania (the Lower Danube Survey for Paleolithic Sites project, funded by Max Planck Institute for Evolutionary Anthropology, Leipzig).

Results

The Dealul Guran site (Village of Peștera, Constanța County) is a collapsed rockshelter located on a Cretaceous limestone hill, very rich in flint nodules.

The stratigraphic sequence comprises five geological units, consisting of weathered sediment, redeposited from the bedrock unit, mixed with a small amount of loess. Three archaeological layers were identified, and absolute ages were obtained through luminescence techniques (OSL, IRSL, and post IR-IRSL). For the oldest layer, three ages were obtained: 392 ± 23 ka, 388 ± 36 ka and 320 ± 21 ka, respectively; they indicate a MIS 11 occupation of the site, thus representing the first Lower Paleolithic site in Romania and one of the oldest securely dated sites in Eastern Europe. The more recent archaeological layers were dated to MIS 3 (32.1 ± 2 ka, layer 2) and MIS 2 (17.1 ± 1.1 ka, layer 1), respectively.

The Lower Paleolithic assemblage belongs to Mode 1 (core-and-flake industries) and mainly reflects flint quarrying activities. The most numerous pieces are cortical flakes and tested blocks. The absence of the retouched tools so far corroborates the expedient character of the industry, due to the abundance of good quality raw material. The post-depositional factors seem to have had low intensity, given that the percentage of edge damage on the flakes is fairly low, and the size of the knapped pieces span from a few millimeters flakes to decimeter-large tested blocks and cores.

Implications

The discovery of the Lower Paleolithic site of Dealul Guran testifies for the Middle Pleistocene hominin presence in the eastern European loess steppes. The small number of sites discovered so far may be due to the very thick loess deposits that cover them.

Small Mammals (Rodents, insectivores) in the Plio/Pleistocene sediments of Greece

Constantin Doukas

Department of Historical Geology and Palaeontology, University of Athens, 157 84 Athens, Greece.

The study of small mammals in Greece had a relatively late start. The main focus was on Neogene faunas (Oligocene- Miocene boundary to Plio-Pleistocene boundary) Later on (1994-1998) the CoMCoM program (Correlation Marine Continental Miocene) studied Miocene, Pliocene (Ptolemais) and Pleistocene (Megalopolis) sediments. Together with small mammals, Paleomag, cyclostratigraphy, $^{39}\text{Ar}/^{40}\text{Ar}$ dating and pollen gave a clear picture in understanding that time frame. PaGE is also exploring the lignite containing lacustrine Megalopolis basin. Mammals (large and small) have been recovered from the Megalopolis basin in general and from the Marathousa member beds in particular. These fossils are generally dated late Biharian. An important find at the Marathousa member is a human M3. The Megalopolis section is dated as Pleistocene with magnetostratigraphy (lower Brunhes) and palaeontology (Late Biharian). Subsequent astronomical tuning of the lignite pattern gave ages of ~900 ka for the base of the section and ~350 ka for the top. The data from Palynology suggest a climatic origin related to glacial/interglacial alternations for the sedimentary cycles. Here the lignite represents a warm phase.

Excavating Rodafnidia, an Acheulean open air-site on Lesvos, NE Aegean Sea

Nena Galanidou¹, John MacNabb², Giorgos Iliopoulos³, James Cole⁴

¹Dept. of History and Archaeology, Univ. of Crete, Greece

²Dept. of Archaeology, Univ. of Southampton, UK

³Dept. of Geology, Univ. of Patras, Greece

⁴Institute of Archaeology, Univ. of Oxford, UK

This paper reports on fieldwork conducted at Rodafnidia, an open-air Acheulean site on Lesvos. Situated on Kaloni Bay, close to the thermal springs of Lisvori, Rodafnidia is a unique research target by virtue of its geographical position and density of large cutting tools. On Lesvos we have opened a window onto the early occupation of Europe at a site whose counterparts are found in the Lower Palaeolithic of W Asia. The site offers insights into the role of the NE Mediterranean, both as a dispersal route between Africa and Eurasia and vice versa, and as a zone of stasis, occupation, and social interaction in its own right. The project is coordinated by the University of Crete and brings together an international team of specialists from the fields of Archaeology, Palaeoanthropology and the Earth Sciences. It consolidates a new paradigm in the study of the Greek Palaeolithic, devoid of the sampling biases of mainland- and cave-focused research.

**Earliest dispersals and migrations to Europe via Balkans in Lower
to Upper Palaeolithic:
Evidence from Northern Bulgaria**

Guadelli, J.-L.¹, Sirakov, N.², Sirakova S.², Boev Z.³, Boudadi-Maligne M.¹, Dimitrova I.⁴,
Fernandez P.⁵, Ferrier C.¹, Guadelli A.², Iordanova D.⁶, Iordanova N.⁶, Kovacheva M.⁶,
Krumov I.², Leblanc J.-CL.⁷, Miteva V.², Popov V.⁸, Queffelec A.¹, Spassov R.², Taneva S.²,
Tsanova T.⁹.

¹*PACEA/IPGQ-UMR5199 CNRS, Université Bordeaux I, Avenue des facultés, Bâtiment B18,
33405 Talence cedex, France*

²*National Institute of Archaeology and Museum of Bulgarian Academy of Sciences, 2,
Saborna Street, 1000 Sofia, Bulgaria*

³*National Museum of Natural History, 1 Tsar Osvoboditel Blvd, 1000 Sofia, Bulgaria*

⁴*New Bulgarian University, Department of Archaeology, Building 2, Room 219, Sofia,
Bulgaria*

⁵*LAMPEA-UMR6636 CNRS, MMSH, 5 Rue du château de l'Horloge, BP 647, 13094 Aix en
Provence cedex 2, France*

⁶*Institute of Geophysics of Bulgarian Academy of Sciences, Acad. G. Bontchev Street, bat.3,
1113 Sofia, Bulgaria*

⁷*TRACES, UMR5608 CNRS, Université de Toulouse le Mirail, Maison de la Recherche, 5, allées
Antonio Machado, 31048 Toulouse Cedex 1, Bulgaria*

⁸*Institute of Zoologie of Bulgarian Academy of Sciences, 1, bd. Tsar Osvoboditel, 1000 Sofia,
Bulgaria*

⁹*Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology,
Deutscher Platz 6, D-04103 Leipzig, Germany*

Kozarnika Cave (northwestern Bulgaria) delivered a long archaeological sequence that covers almost the entire Pleistocene. Lower levels dating by macro and micromammals associations from the second half of the Early Pleistocene (between the MNQ17 and MNQ19) to the first half of Middle Pleistocene (OS 15-11) gave us some assemblages with non-Acheulean core-and-flake (and not pebble-core) industries. Middle Palaeolithic levels of Balkan Levallois-mousterian with leaf points are contemporaries of OS 6-3 *pro-parte*. The Upper Palaeolithic sequence is dated by AMS between 41-43 ka BP and about 11 ka BP (uncalibrated dates). This long monotonous (?) archaeological sequence (about 30 ka), begins with Initial Upper Palaeolithic lamellar type industry with marginally backed bladelets which has no Aurignacian elements – the Kozarnikian, a possible precursor of the local variant of Gravettian technocomplexe in overlaying levels. This absence of Aurignacian elements is also confirmed by bone industry. Because of successive Palaeolithic sequences in Kozarnika Cave and its geographical position, this site is a milestone in the different phases of earliest colonization and migrations to Europe.

Well Dated-Modern Human Occupation in Üçağızlı Cave and Human Fossil Record of Turkey

Erksin Güleç

Department of Anthropology, Ankara University, 06100 Tandogan, Ankara, Turkey

Most scientists agree that modern humans left Africa relatively recently, and it was traditionally thought that the route taken was northwards, overland through the Middle East and beyond. At the geographical nexus between continents, Anatolia (Asian Turkey) plays an important role in ideas about hominin dispersals and migrations. Turkey is the geographic connection between Europe, the Middle East, and Africa and reconstructions of dispersal routes of Pleistocene hominins almost invariably show migratory paths across the Anatolian landmass. Moreover, some of the earliest sites outside Africa, such as Dmanisi and Ubeidiya, are situated close to Anatolia, suggesting early routes of dispersal must have crossed through the region.

Despite this great potential, there are not many human fossils found in the country. The fossil records mostly are found on the Mediterranean coast, especially from the Hatay and Antalya provinces. Parallel to these, a fragmentary cranium from Denizli, and the earliest traces of human presence come from the Konya region, located in the inner parts of the country.

The Hatay region occupies an important place in paleoanthropological studies, situated along the Mediterranean coast near the Syrian border. It contains many Paleolithic sites, especially coastal caves. Tikalı, Merdivenli, Kanal and Üçağızlı Caves are some of them. The Paleolithic material culture in the region shows many similarities to contemporary archaeological materials from the Mediterranean Levant. This area may represent the northern limits of Levantine populations during the Pleistocene and it likely is the route through which human groups and cultural influences entered the Levant from the north. For this reason, the region could play a key role in understanding the migration of Neanderthals and early *Homo sapiens* into and out of the Levantine area. At Üçağızlı cave we have been finding the earliest traces of the modern humans in the country. It is located on the Mediterranean coast of the Hatay region, around 15 km south of the mouth of the Orontes (Asi) river, in the most northeastern corner of the Mediterranean basin. Our work at the cave in the last decades has revealed a nearly continuous sequence of human occupation beginning with the Early Upper Paleolithic (50,000 years ago) to just before the advent of [food producing economies \(10,000 years ago\)](#).

The stratigraphic sequence at Üçağızlı cave can be divided into three major segments. The uppermost, layers B-B3 through C, contains archaeological materials attributable to the "Ahmarian", an early Upper Paleolithic culture complex typical of the eastern Mediterranean region. Layers F through I yield archaeological assemblages which are typical of Levantine Initial Upper Paleolithic or "transitional" industries. Archaeological materials from layers D and E represent a transition between these two components. These Levantine industries are pivotal to addressing of the origins of the Upper Paleolithic in Eurasia and the complex of archaeological traits thought to represent "modern human behavior."

Paleoanthropology in Greece: Recent finds and their implications

Katerina Harvati

*Paleoanthropology, Department of Early Prehistory and Quaternary Ecology, Senckenberg
Center for Human Evolution and Paleoecology,
Eberhard-Karls University of Tübingen, Rümelinstrasse 23, Tübingen 72070, Germany*

Despite long study, European paleoanthropology is still hotly debated and continues to produce unexpected and surprising findings, which have radically changed our ideas about human presence on the continent. Nevertheless, important gaps remain in the European human fossil record, one of the most glaring of which centers over South-Eastern Europe. This region's record is critical addressing questions about the course of human evolution in Europe, as it stands at the crossroads of Europe and the Near East and on the most direct hypothesized dispersal corridor from Africa through the Near East into Europe for both archaic and early modern humans. This article is a review of the fossil human record of Greece and its context, and its relevance for European paleoanthropology. The presentation will focus in particular on the single human molar recovered from Megalopolis, Peloponnese, likely the earliest human fossil specimen from Greece. Additionally, new results regarding the presence of Neanderthals in Greece will be presented, as well as an evaluation of the Petralona cranium.

Early Paleolithic localities in the southeastern part of the Balkans (Bulgaria)

Stefanka Ivanova

*National Institute of Archaeology with Museum, Bulgarian Academy of Sciences, Saborna Str.
2, 1000 Sofia, Bulgaria*

In the southeastern part of the Balkan Peninsula (in Bulgaria) traces of settlement from the early Palaeolithic were discovered. These include the open sites from the Western and Eastern Rhodopes and the Kozarnika cave - near the northwestern border of Bulgaria. These areas were populated several times, with different durations of the settlements. In some flint assemblages are present chopper tools, cores, flakes and implements. In other cases (although rare) there are bifacial forms and single bifaces. Among the tools most numerous are the scrapers different kind of pic like artefacts and the flakes with various types of retouches - with notched retouches dominating.

The chronological and cultural setting of the ensembles of the open sites is hampered by the lack of stratigraphic data. Ensembles from the cave Kozarnika refer to the period from 1600000 to 600000 BC.

Studies of the early Palaeolithic deposits in the southeastern part of the Balkans are still in their beginning. But the survey results suggest the need for a new look at the problems of the early settlement of the European continent.

The results of the research of lower Paleolithic sites in Bulgaria pose the question about possible repeated waves of migration to Europe. Two possible ways of settling in Europe pass through the Balkans: through the Bosphorus and the Dardanelles and the northern Black Sea coast. The presence of some bifacial early Paleolithic ensembles can be explained by the convergence of certain types of tools and technological solutions

The importance of Croatian Pleistocene hominin finds in the study of human evolution

Ivor Janković¹, James C.M. Ahern², Ivor Karavanić³ and Fred H. Smith⁴

¹Institute for Anthropological Research, Zagreb, Croatia

²Department of Anthropology, University of Wyoming, Laramie, WY 82071, USA

³Department of Archaeology, University of Zagreb, Zagreb, Croatia

⁴Department of Sociology and Anthropology, Illinois State University, Bloomington-Normal, IL 61790, USA

Although Croatia has a rather small number of sites that have yielded human skeletal material from the Pleistocene (especially compared to some other countries), it has yielded some very crucial ones. The two Neandertal sites (the Hušnjakovo site in Krapina, and the Vindija cave) are essential in our attempts to understand Neandertal variation and behavior, as well as shedding light on the complex patterns of their demise and numerous other issues. The Hušnjakovo site in Krapina has played an important role in historical development of paleoanthropology, formation of initial theories of modern human emergence and the role of Neandertals in human evolution. It is still the largest Neandertal site according to the minimum number of individuals found; and as the stratigraphic sequence is relatively short, it provides a rare glimpse into idiosyncratic, ontogenetic, and sex-related variation of a relatively early Neandertal „population.“. The Vindija Neandertal sequence has provided us with a sample from the final phase of European Neandertal reign, at a time when anatomically modern humans were already present in Europe. Morphological studies of the Vindija sample suggest that these late Neandertals are quite different in some aspects from other Neandertals, and some authors (including us) see this as a result of biological contacts with anatomically more modern groups. In addition, the Vindija Neandertals are very interesting culturally, as some finds suggest more modern aspects of their behavior compared to „classic“ Neandertal sites. Lastly, in recent years successful extraction of ancient DNA from three Vindija bones has provided a more complete insight into the genomic properties of Neandertals, including evidence of their contribution to modern Eurasian gene pools.

No skeletal evidence of early modern humans are known from Croatia. However, the frontal bone from Velika Pećina, once considered among the earliest modern specimens from Europe, played an important role in clarifying the distinction between Neandertals and modern humans in Europe.

Another site of interest comes from the coastal region of Croatia – the site of Šandalja II in Istria. It is the only site with direct association of human skeletal finds and late Paleolithic, Epigravettian industry. Although limited and rather fragmentary, the Šandalja II human remains provide us with a rare opportunity for studies of anatomical properties and behavior of the late Paleolithic inhabitants of the eastern Adriatic region. This, in turn, allows for comparisons with other contemporary sites on both sides of the Adriatic coast.

The fossil hominin sample from Croatia continues to be of great value to current approaches to the study of Neandertal paleobiology and their relationships to us. Attempts to enhance this sample have been ongoing since the 1990s. Excavations at the Mousterian site of

Mujina Pećina and the Upper Paleolithic site of Zala failed to yield human skeletal remains. Current excavations at Bukovac Pećina and Velika Pećina in Kličevica hold considerable potential for enhancing both the archaeological and skeletal samples pertinent to later human evolution in the south central Europe.

Recent research on the Middle/Upper Paleolithic interface in Croatia, in the context of Central and SE Europe

I. Karavanić¹, R. Šošić¹, J.C.M. Ahern², N. Čondić³, I. Janković⁴, K. Zubčić⁵, F.H. Smith⁶

¹*Department of Archaeology, Faculty of Humanities and Social Sciences, University of Zagreb, I. Lučića 3, 10000 Zagreb, Croatia*

²*Department of Anthropology (3431), University of Wyoming, 1000 E. University Ave, Laramie, WY 82071, USA*

³*Archaeological Museum Zadar*

⁴*Department of Anthropological Archaeology, Institute for Anthropological Research, Amruševa 8, 10000 Zagreb, Croatia*

⁵*Croatian Conservation Institute*

⁶*Department of Sociology and Anthropology, Illinois State University, IL, USA*

Paleoanthropological, archaeological and genetic evidence from the Croatian Middle Paleolithic sites play the important role in scientific debates about human evolution, Neandertal adaptation and the origins of anatomically modern humans. Human fossil remains and Paleolithic industries from Krapina and Vindija (situated in NW Croatia) have been analyzed and described in many publications. Differently from the situation in NW Croatia, the cultural and paleoecological situation from the same period in Dalmatia (south Croatia) is little known. Until recently, Paleolithic research in this region was rare. This paper reports alternative interpretations of Vindija G1 industry associated with late Neandertals, preliminary results of the excavation at Bukovac Pećina in Gorski Kotar region as well as preliminary research results from three Dalmatian sites – Mujina Pećina, Velika Pećina in Kličevica and Kaštel Štafilić - Resnik.

The lithic industry of the Vindija G1 layer is Mousterian, while the Szeletian bifacial stone point is seen as an import, a result of the contact of various Neandertal groups from northwestern Croatia and Hungary. The Upper Paleolithic elements in the same level, especially the bone points, and possibly some lithic types, are a result of contact (exchange or acculturation) between Neandertals and anatomically modern groups, or of mixing with the upper layers of the site. Early upper Paleolithic bone points were also found on other Croatian sites. About hundred years ago a bone point was found at Bukovac pećina. Based solely on the single bone point assignment of the industry to early Upper Paleolithic was questionable, although likely. One of the major aims of the recent excavations (2010-2012) in this cave was to determine the layer from which the bone point came and dating of the layer(s). Thus far, the C¹⁴ dates confirm the Aurignacian timeframe.

The only site in Dalmatia with a clear and homogenous Mousterian stratigraphic sequence that was excavated systematically (1995-2003) is the Mujina Pećina near the city of Kaštela. Radiocarbon AMS and ESR dates obtained for the layers of this sites are the first chronometrics dates for the Mousterian industry on the eastern Adriatic coast. The interface between Level E2 and E1 was dated by AMS to 45ka BP, while the AMS age of overlying levels, calculated as the mean of 5 dates from these levels, is about 39 ka BP (Rink et al. 2002).

A test excavation on another Dalmatian site – Velika Pećina in Kličevica near Benkovac was conducted in 2006 and more extensive excavation started in 2012. A short stratigraphic sequence was established, with several layers yielding rich Mousterian finds, and a single radiocarbon AMS date of about 39 ka BP was obtained on an animal bone from level D.

Small scale underwater excavation at the site of Kaštel Štafilić - Resnik using a grid was conducted in 2008 and research continued in 2010, 2011 and 2012, during which only surface finds were collected over a larger area. The methodology used will be further described in the presentation. The locality is an open air Middle Paleolithic site dating to the time when the sea level was much lower than today's. Although the finds are somewhat disturbed (due to the action of waves and other factors) it seems that their accumulation is not a result of displacement from another locality as was reported earlier.

Although no diagnostic fossil hominin remains have been found on Dalmatian Middle Paleolithic sites, the archaeological assemblage (Mousterian industry) and the results of chronometric dating place their sequences prior to the earliest known anatomically modern human groups in Europe. Although it is not clear why no site in the eastern Adriatic region thus far documents the Middle/Upper Paleolithic transition, and why early Upper Paleolithic sites are very rare, new research on Croatian sites adds to our understanding of the distribution of Mousterian people and the complexity of the processes that underlie the interactions between Middle and Upper Paleolithic populations in the late Pleistocene of Central and SE Europe.

The Plio-Pleistocene large mammal faunas from Greece

George D. Koufos, Dimitrios S. Kostopoulos

Aristotle University of Thessaloniki, School of Geology, Laboratory of Geology & Paleontology, GR-54124 Thessaloniki, Greece

Since the 1980's the Plio-Pleistocene mammal faunas of Greece were poorly known. Sporadic findings of a few "Villafranchian" taxa across the country gave a fragmentary view of a rather wealthy and promising record. A great effort by the Greek paleontologists during the 80's and 90's provided valuable new data, discovering several new fossil sites and unearthing a great amount of large mammal fossils. The systematic study of this material allowed a better understanding of the Plio-Pleistocene Greek mammal faunas, by means of taxonomic content, zoogeographic relations, chronological succession and palaeoenvironment. Although discontinuous, the Greek Plio-Pleistocene large mammal fossil record is quite rich, including most of the mammalian groups and several new and rare taxa.

We still know little about the early Villafranchian (mid-late Pliocene) large mammal faunas of Greece, as they are poorly documented. Mammutids, rhinos, medium-sized cervids, gazelles, primitive *Sus*, stenoroid horses and machairodontines build part of this faunal community that looks similar to the contemporaneous West European one. Middle Villafranchian (earliest-early Pleistocene) large mammal assemblages are much more abundant in Greece allowing a better knowledge. Stenoroid horses predominate during this period, together with small- to medium-sized bovids, three lines of cervids and a variety of carnivores. Zoogeographic relations with both the west and north-east domains are evidenced. Epi-Villafranchian (late early Pleistocene) Greek large mammal faunas are again few in number but rich enough to provide a good idea for this period. Large-sized horses, medium- to large-sized bovids and giant cervids make most of the palaeocommunity.

From a palaeoenvironmental point of view the Greek Plio-Pleistocene large mammal record reveals a transition from open woodlands in late Pliocene to parklands / savannah woodlands during the early Pleistocene and to open grasslands during the late early Pleistocene. During this environmental shift several taxa arrived in Greece toward their westward expansion, whereas other made their last European appearance.

The Paleolithic of the Central Balkans: an overview

Dusan Mihailovic

Faculty of Philosophy, University of Belgrade

The number of newly discovered Middle Paleolithic sites in the Central Balkans have significantly increased over the last decade. Systematic excavations identified Middle Paleolithic occupations in Mala and Velika Balanica, Šalitrena cave, Hadži Prodanova cave, Pešturina, Golema dupka and Milušinačka caves as well as Selačka and Sokogradska rock shelters, and the Danubian terrace in Petrovaradin Fortress. The sites were also identified during systematic reconnaissance of the West Morava terraces in central Serbia (Samaila, Kosovska kosa). Charentian industries dated to Middle Pleistocene in both Velika and Mala Balanica caves support the notion that this complex spread from Anatolia and the Near East. Open air sites of Kosovska kosa, Samaila in the Western Morava valley - likely of terminal Middle Pleistocene and Early Upper Pleistocene - are characterised by predominance of Levallois elements and the retention of some older traditions like Clactonian and pebble and flake tool industries. Later sites witness the admixture of Charentian and Levallois elements at Petrovaradin Fortress and Pesturina cave (layer 4), with the difference that in Petrovaradin Fortress, where backed bifacial scrapers are present, Charentian elements are less common. In Serbia, the industries of Typical Mousterien, very common in surrounding regions, are witnessed only in temporary camps. Denticulate Mousterian in the upper layer of Pesturina (layer 3), bears witness that this facies and associated behaviors existed in the Late Middle Palaeolithic of the Central Balkans. Overall, new research demonstrates that the Central Balkan was intensively occupied in the Middle Palaeolithic, that Morava valley system represented one of the most convenient routes for the spread of technological innovation and that the observed industrial variability could have been largely a result of factors associated with economic behavior.

The Palaeolithic of Insular Greece

Eleni Panagopoulou, Panagiotis Karkanis

Ephorate of Palaeoantropology-Speleology of Southern Greece

An important aspect of the history of human evolution is the colonization of islands. Greece is expected to have been among the core areas for the peopling of Eurasia through land or sea routes. Although palaeolithic evidence from Aegean and Ionian islands is still scarce, recent evidence is rapidly changing the picture.

This presentation focuses on: (a) the identification of the current status of the palaeolithic of insular Greece, and (b) on the prospect of enrichment of this record in the light of the recent reconstructions of the Aegean and Ionian palaeogeography. It is suggested that the Mediterranean was not an insuperable barrier to hominin dispersals in the Middle and Late Pleistocene.

The role of Central Balkans in the peopling of Europe: the paleoanthropological evidence

Mirjana Roksandic

University of Winnipeg

Balanica hominin mandible BH-1 is the first specimen from the Central Balkan unearthed during controlled and well documented archaeological excavations. With its primitive morphology and a Middle Pleistocene date, the specimen is relevant for our understanding of human evolution in the Southeast of the Continent, which was under different environmental constraints from the better known populations in the Western Europe. Shaped by repeated glaciations events throughout the Pleistocene the West of the continent experienced periods of isolation, resulting ultimately in a very specific Neandertal morphology. The eastern part of the continent did not experience isolation and consequently, evolutionary forces need not have resulted in a morphologically distinct group. The paper presents an overview of available information on specimens currently known from the Central Balkans and examines the Balanica mandible in the context of the Central Balkan hominin record and the larger area including the Anatolia and the Apennine Peninsula, with emphasis on the Middle Pleistocene.

Techno-typological variability during the Middle-to-Upper Palaeolithic transition: Examples from the Balkans and neighbouring regions

Valery Sitlivy

Institute of Prehistoric Archaeology, University of Cologne, Germany

The origin of anatomically modern humans in Europe and their relationship with Neanderthals is one of the key topics in prehistoric archaeology. Archaeologists have long focused their interest on changes in the material record across the Middle Palaeolithic/Upper Palaeolithic boundary. During the period of the Middle to Upper Palaeolithic transition, depending on the geographic area, features indicating both continuity and discontinuity in technological development have been described in the literature. However, recently published data and discussions suggest that the situation is even more complex than is commonly presented, showing that a universal model of the 'Big Transition' does not fit regional patterns. They document not a unique, universal scenario but rather several processes of change leading to the establishment of the UP following several different pathways depending on local circumstances.

The transitional period in the Balkans and neighbouring Central and Eastern Europe exhibits considerable variability and the co-occurrence of various "cultural" entities, flaking methods and techniques. A number of units expanding after the Last Glacial (MIS 5 – MIS 3) can be distinguished, taking into consideration their technological and typological features: Micoquian, Mousterian, Levallois-Mousterian, Blade Levallois-Mousterian, Blade Mousterian and Initial/Early Upper Palaeolithic. Several non-Levallois and Levallois methods of flake, blade and point production have been documented in MP complexes. These reduction methods could have been used independently, coexisting in a single industry or representing the dominant system, or have been technologically mixed within a single reduction sequence. There is no clear geographic and chronological clustering of technologies or a single evolutionary trend from "archaic" to "developed" methods.

The Initial/Early Upper Palaeolithic comprises a broad mosaic of industries (e.g. Bohunician, Uluzzian, Protoaurignacian, bifacially-based assemblages), some of which may be part of the transition or at least chrono-stratigraphically preceding the "classical" UP. Early/Initial UP knappers applied several reduction models: (a) exclusive/dominant UP laminar strategies, (b) combination of such strategies along with different MP technologies and (c) fusion of volumetric blade and "flat" MP methods, especially Levallois for points, in a single reduction sequence. The final model has been demonstrated by refitting and is not commonly present. Also, the risk of contamination/mechanical mixture of MP material in UP layers, erroneously producing "transitional" industries is evident. Several examples of different lithic production systems will be discussed here.

The Balkans as a route for the earliest dispersal of *Homo* towards Europe: ecological conditions in Southeastern Europe between 2 - 1 Ma and the timing of the first human occupation of Europe

Nikolai Spassov

National Museum of Natural History – Sofia

I. The timing and routes of the earliest dispersal of *Homo* into Europe.

Fossil evidence indicates that the first known species of *Homo* (*H. rudolfensis*, *H. habilis* and *H. ergaster*) originated in East Africa at about 2.4-1.9 Ma. It is difficult to say which of them undertook the first movement out of Africa. However, judging by the chronology of the earliest Asian localities indicating the presence of humans (Riwat, Pakistan – 1.9 Ma, Sangiran, Java – 1.8 Ma and Dmanisi, Georgia, at the European gates - 1.85-1.78 Ma: Dennel, 2004; Ferrig et al. in press – 2012) the time of the first wave of dispersal to the north might correspond to 2 Ma or a little later.

Until recently, the data for the first European occupation older than 1 Ma were considered unreliable (see: Dennel & Roebroeks, 1996). On the other hand it seems logical to expect such kind of dates: the geological data support the hypothesis that the early *Homo* dispersal towards Euro-Asia was through the Arabian peninsula coastal area and Asia Minor; from there it would be possible to disperse not only towards the east but also to the west into Europe (Spassov, 2001). Recently an increased number of arguments support the thesis of a long chronology for the human occupation of Europe with dates much older than 1 Ma. One of the principal problems related to the question about the earliest human waves from the east towards Europe are: was Europe accessible for dispersal movements at the time of the first migration out of Africa and the first evidence of *Homo* in Asia (i.e. at the classically defined Plio-Pleistocene boundary)? Was *Homo* able to move at this time in the direction of Europe through the Bosphorus – the shortest path? Two hypotheses of dispersal towards Europe are possible in relation to this:

A direct dispersal from Africa with dating to about ~1.9 Ma (Spassov, 2001; 2003) There is no evidence of a human presence at this time, but some indications from Olivola, Italy:1.95 Ma (?) (Abbate, Sagri, 2011), Dealul Mijlociu, Romania ~1.8 Ma (Radulescu & Samson, 1990) and the very new discoveries in the Taman Peninsula, S. Russia – more than 1.9 (Ma?) (Shchelinsky et al., 2010a) – could confirm this early date for the first wave of human invasion.

A more recent dispersal from a secondary nucleus of speciation in Asia Minor-Caucasus (as Dmanisi: see the difference in comparison to the morphology of African early *Homo*).

Two different routes of dispersal were possible corresponding to the routes known or supposed for the dispersal of the migratory waves of fossil and recent mammals. Once in Asia Minor, early *Homo* could move towards Europe directly via the Bosphorus or by using a circuitous route around the Black Sea basin along the northern peri-Pontic coastal area. Note, however, that the human dispersal out of Africa is probably not a single event (Dennel, 2003; Spassov, 2003). We could suppose also that the first dispersing populations may not

have survived given that the early *Homo* was probably not well adapted to the climate of the northern latitudes. The paleontological and palaeoclimatic data must indicate the time and the routes of the possible first penetration of *Homo* in Europe.

I.1. Time of the first possible wave of dispersal. The ecological conditions:

I.1.1. The local Slivnitsa faunal (biochronological) unit based on mammal megafauna and the direct Balkan route. The faunal data for the time span 2.3 - 2 Ma based on the fauna of Varshets, Bulgaria and Dafnero and Volakas, Greece (St. Vallier biochronological unit) indicate relatively humid climates where the physiognomy of the landscapes was characterized chiefly by forest-steppe mosaic biotopes or open forests (Spassov, 2000). The first appearance of some new steppic artiodactyls and related carnivores in Europe, to the west of the Black Sea, was registered in the immediately pre-olduvaian site of Slivnitsa (Bulgaria) and slightly thereafter in Gerakarou (Greece) at 1.95/1.9 and 1.8 Ma, respectively. Based on its fauna, the locality of Slivnitsa is situated in time between Chilhac (France) and Olivola (Italy) and its age is estimated to be somewhat more than 1.9 Ma. The fauna provides a strong signal for landscape aridification. Material from Slivnitsa records the first dispersal from the east of the wolf-like canids, of *P. onca gombaszoegensis* and a mass Caprinae migration, including the first *Ovis* in Europe (Spassov, 2003; 2002). This faunal event must correlate with a cooling event, named the Meria cooling, registered in Georgia and Azov region, with an estimated age just before the Oldovaian warming (Zubakov, Borzenkova, 1990). This cooling is related to a freshening of the Black sea waters and suggests a temporary closing of the Bosphorus thereby providing an explanation for the presence in Slivnitsa of a number of earliest migrants of the later European fauna. So, the time and conditions of the Slivnitsa faunal event gives ground to estimate the first possible wave of *Homo* dispersal at the same time at ~ 1.95 Ma, using the routes of dispersal of the megafauna, and this could correlate with the first registered *Homo* wave into Asia.

I.1. 2. The Northern peri-Pontic route and the newest finds in the Azov region. Some new discoveries in the Azov Sea region (Kermek) are consistent with the hypothesis that the earliest dispersal of humans into Europe was very old (roughly 2 Ma based on the micromammal fauna (if this is not an example of relic faunas – nota N.S.) (Shchelinsky et al., 2010a) via the Northern peri-Pontic route under conditions of pre-Olduvian cooling.

I.2. The earliest “well” documented wave of *Homo* dispersal. It is very possible that Kozarnika B2-2 (Bulgaria), Pirro Nord (Italy) and eventually the lower level with artifact accumulations in Benkovski (Bulgaria) as well as Sinyaya Balka & Rodniki (S. Russia) that are close in age and that could represent the Villafranchian-Epivillafranchian boundary at 1.3-1.2 Ma could correspond to the first wave of documented human migration towards Europe, related to the increasing of the landscape aridification (Kahlke et al., 2011). The pollen spectra and faunal associations in Rodniki & Sinyaya Balka (Taman, S. Russia 1.6-1.2 Ma) indicate widespread forest-steppe and open steppe landscapes. (Shchelinsky et al., 2010 b). The domination of the open grassy landscapes are typical for the well documented paleontological locality of Apollonia (Kostopoulos, Koufos, 2000) with an age of approx. 1.2 Ma.

II. Some palaeoecological conclusions.

The time of the first waves of human penetration in Europe ([?]1.9/1.5 – 1.3/1. 2 Ma] could be related to the conditions of increasing of the aridification, that in turn led to the

domination of biotopes in which the open/mosaic landscapes played an important role. Such landscapes correspond roughly to those of African early *Homo*.

The human fossil record of Bulgaria and recent activities of the Balkan Paleo Project

David Strait

Department of Anthropology, University at Albany

Despite the fact that important Paleolithic sites are known from Bulgaria and that the country was likely to have been periodically traversed by dispersing hominins during the Pleistocene, the human fossil record of the country is sparse. Only a few fragmentary remains are known from Temnata Dupka, Bacho Kiro and Kozarnika caves. Yet, there is no doubt that the discovery of human fossils from Bulgaria could shed considerable light on biogeographic hypotheses pertaining to the evolution of humans in Europe. Towards that end, the Balkan Paleo Project (BPP) seeks to identify a suite of paleontological and archaeological sites relevant to human evolution in order better understand the ecological context of hominin dispersals into and out of Europe. To date the BPP has surveyed for and investigated roughly 40 caves and has conducted excavations in three cave complexes (Arkata, Magura, Leiarna). These excavations have recovered Upper and Middle Paleolithic assemblages and include the first known Paleolithic sites from south-eastern Bulgaria. Other cave and open-air sites with paleontological and archaeological potential have been identified. Preliminary results of these activities are reported here.

This research was made possible by funding from the America for Bulgaria Foundation and the American Research Center in Sofia (grants 10ICAB1 and 12ICAB2).

Long-term climate and vegetation changes

Polychronis Tzedakis

Department of Geography, University College London, UK

A defining feature of the Quaternary Period (the last 2.6 million years) is the quasi-periodic expansion and contraction of major Northern Hemisphere (NH) ice sheets. During the Early Pleistocene (2.6-0.78 Ma), glacial-interglacial cycles occurred with a period of 41 kyr, with maximum ice volumes ranging between one-half and two thirds of the Last Glacial Maximum value. A shift in the dominant periodicity from 41-kyr to 100-kyr took place during the so-called Middle Pleistocene Transition (1.2-0.7 Ma), with the first 100-kyr cycle occurring over Marine Isotope Stages (MIS) 25 to MIS 22 and culminating in the first major glaciation ~0.9 Ma. After 0.65 Ma, ice volume variations were further amplified and became dominated by the 100-kyr cycle along with a 23/19-kyr component. An important further development in our understanding of Quaternary environments has been the realization of the extreme and pervasive nature of millennial-scale climate variability, especially during intervals of increased ice volume. During the last glacial, abrupt temperature decreases over Greenland (Dansgaard-Oeschger [D-O] stadials) have been shown to be coeval with iceberg discharges and sea-surface temperature (SST) reductions (the most extreme of which are known as Heinrich events [HEs]) in the North Atlantic. These iceberg discharges disrupted the Meridional Overturning Circulation (MOC), leading to abrupt NH cooling and gradual warming of Antarctica. This asymmetric response can be explained by a bipolar-seesaw mechanism, whereby changes in the strength of the MOC lead to changes in interhemispheric heat transport. These events were followed by a rapid resumption of the MOC and abrupt warming in the North Atlantic, while Antarctica gradually cooled. More recent evidence suggests that millennial-scale variability and the operation of the bipolar-seesaw have been a feature of at least the last 800 kyr.

While an extensive body of evidence documenting changes in the Earth System during the Late and Middle Pleistocene has accumulated, our understanding of the nature of climate changes during the Early Pleistocene is limited. Ice volume changes were dominated by the 41-kyr obliquity cycle, with only weak variance at precessional periods, although summer insolation intensity was dominated by precession. Glacial ice volumes were smaller, but it is not clear whether ice sheets were as extensive as, but thinner than, those of the Late Pleistocene or intermediate in size. On millennial timescales, the presence of ice-rafting events has been documented in Early Pleistocene North Atlantic records, but the character of millennial-scale variability and its interaction with orbital changes have not been examined in detail. In addition, our understanding of their effects on the terrestrial ecosystems is also sketchy. During the Late and Middle Pleistocene, S European vegetation has oscillated between two extreme situations: discontinuous herbaceous communities during glacials and interglacial forest/woodland. Between these two states, transitional phases occurred of varying duration and extent, depending on the direction and rate of change of the system and geographical location. It is not clear, however, whether smaller ice volume maxima during the Early Pleistocene translate to smaller tree population contractions. On millennial timescales, tree populations expanded and contracted repeatedly, closely tracking North Atlantic climate variability during the Late

and Middle Pleistocene, but the amplitude and frequency of abrupt changes in tree populations in the Early Pleistocene remains unclear. Finally, a prominent feature of European vegetation history is the progressive disappearance of cold- and drought-sensitive tree species over the course of the last ~2.6 Myr. These 'serial extinctions' have resulted in a present European tree flora that is significantly reduced in taxonomic diversity compared to the Pliocene. A significant number of taxa disappeared over the course of the Middle Pleistocene Transition, but lack of detailed chronostratigraphical control of terrestrial sites prevents a more precise placement of extinction events and, by extension, a consideration of underlying causes.

Cryptotephra and the Middle and early Upper Palaeolithic in the Balkans

Dustin White^{1,2}

¹*Institute of Archaeology, Oxford University, Oxford OX1 2PG, United Kingdom*

²*Archaeology Department, University of Southampton, National Oceanography Centre, Southampton SO17 1BF, United Kingdom*

Investigations of distally transported (non-visible) volcanic ash, termed cryptotephra, preserved in Middle and early Upper Palaeolithic sites across the Balkans are shedding new light on regional chronostratigraphy and enable the potential to directly correlate archaeological events and palaeoclimate archives (marine and lake sediment cores) through common tephra marker horizons. The synchronisation of these data sets allows the development of a more resolved 'tephra chronological lattice' in which to address key questions related to Neanderthal and early modern human dispersals in Europe, Neanderthal-modern human interactions, the relationships between various late Middle and early Upper Palaeolithic industries, and timescales of climatic and environmental change. This collaborative international research programme forms part of the RESET project (RESponse of humans to abrupt Environmental Transitions), a 5-year UK Natural Environment Research Council (NERC) funded consortium which began in 2008 (<http://c14.arch.ox.ac.uk/reset/>). Results obtained from Palaeolithic cave and rock shelter sites in the Balkans will be presented and discussed within the broader context of European and circum-Mediterranean cryptotephra research.