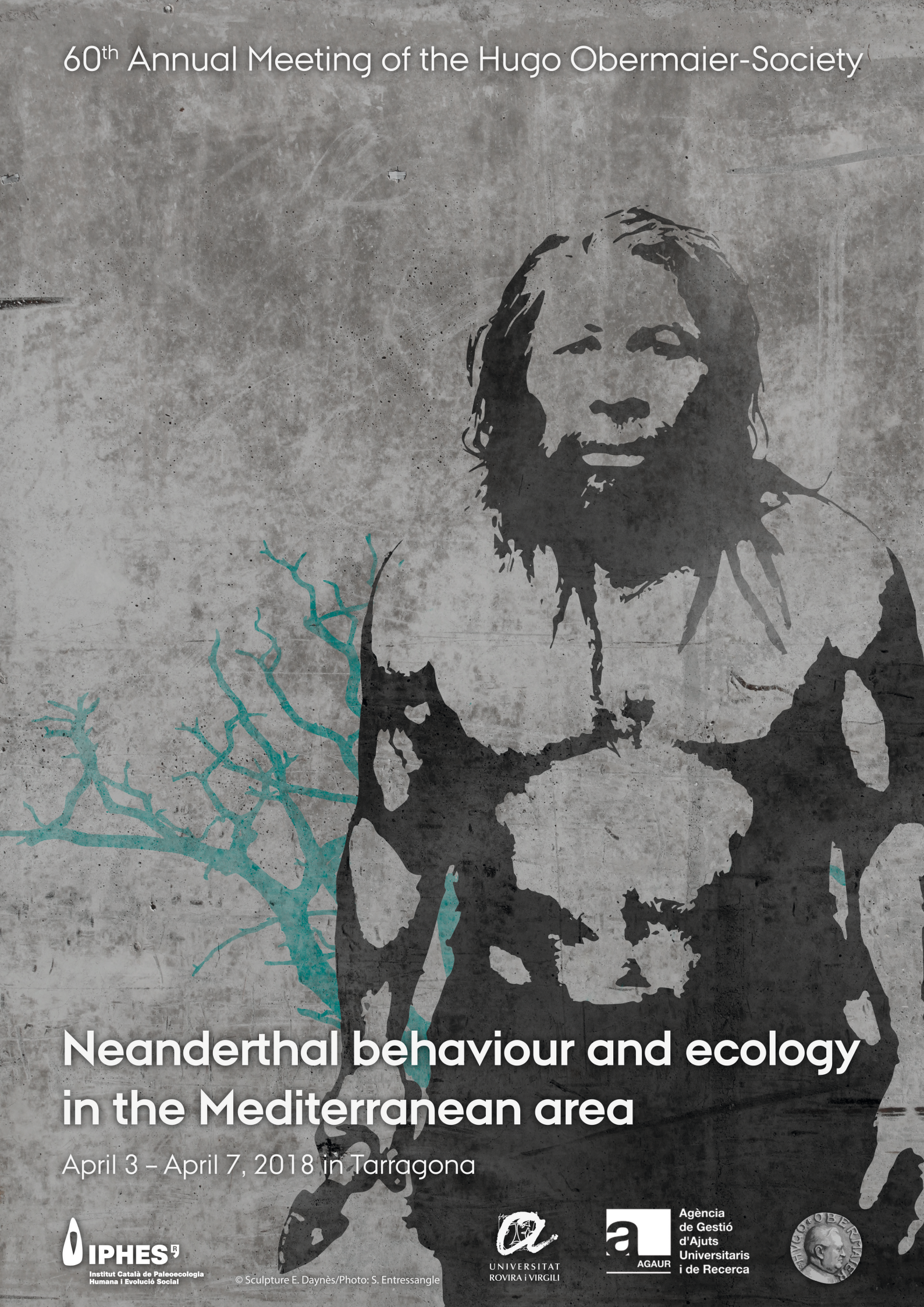
60th Annual Meeting of the Hugo Obermaier-Society



Neanderthal behaviour and ecology in the Mediterranean area

April 3 – April 7, 2018 in Tarragona

IPHES
Institut Català de Paleoecologia Humana i Evolució Social

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UNIVERSITAT ROVIRA i VIRGILI

AGAUR Agència de Gestió d'Ajuts Universitaris i de Recerca

Hugo Obermaier Society

for Quaternary Research and Archaeology of the Stone Age

60th Annual Meeting in Tarragona

April 3rd – April 7th 2018

In cooperation with

UNIVERSITAT ROVIRA i VIRGILI

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Hugo Obermaier Society

for Quaternary Research and Archaeology of the Stone Age

c/o Institut für Ur- und Frühgeschichte, Kochstr. 4/18, D-91054 Erlangen

60th Annual Meeting in Tarragona

At the invitation of the
Institut Català de Paleoecologia Humana i Evolució Social (IPHES)

Conference venue: Aula Magna, Universitat Rovira i Virgili,
Av. Catalunya, 35 - 43002 Tarragona (http://bit.ly/2h54VlR)

Tuesday, April 3rd, 2018

13:00	Opening of the conference office at the Aula Magna
14:30 – 14:45	Welcome by our hosts and the president of the Hugo Obermaier Society
14:45 – 15:00	Awarding of the Hugo Obermaier-Research Grant 2018
15:00 – 18:30	Presentations (*Coffee break* 17:00 – 17:30)
18:30 – 20:00	Poster-Session
20:00	Evening Reception

Wednesday, April 4th, 2018

09:30 – 13:00	Presentations (*Coffee break* 11:00 – 11:30)
13:00 – 14:30	Lunch break
14:30 – 18:00	Presentations (*Coffee break* 16:00 – 16:30)
19:30	Public evening lecture by María Gema Chacón Navarro and Florent Rivals *„Travelling with Neanderthals through the northeastern Iberian Peninsula"*
21:00	Conference Dinner at the Restaurant Mas Roselló (http://www.masrosello.com/index.php)

Thursday, April 5th, 2018

09:30 – 13:00	Presentations (*Coffee break* 11:00 – 11:30)
13:00 – 14:30	Lunch break
14:30 – 19:00	Presentations (*Coffee break* 16:30 – 17:00)
19:15	Society's annual general assembly
21:00	Get-together and dinner at the Restaurant L'Ancora (http://bit.ly/2ipfGfv)

Friday, April 6th, 2018 Excursion A: (probably 8:30 – ca. 18:00)

Visit to the Middle Palaeolithic sites: Teixoneres and Toll caves (Moià, Barcelona)
& Abric Romaní rockshelter (Capellades, Barcelona)

Saturday, April 7th, 2018 Excursion B: (probably 8:30 – ca. 17:00)

Ebro Delta: Museum in Amposta
(Museo de les Terres de l'Ebre http://www.museuterresebre.cat/)
Epipalaeolithic art in Rossegadors and Ulldecona (UNESCO heritage)

Tuesday, April 3rd

13:00 **Opening of the conference office at the Aula Magna**

14:30 – 14:45 **Welcome by Dr. M. Gema Chacón and Prof. Dr. Florent Rivals (IPHES) and the president of the Hugo Obermaier Society Prof. Dr. Thorsten Uthmeier**

14:45 – 15:00 **Awarding of the Hugo Obermaier-Research Grant 2018**

Reports on the Lower and Middle Palaeolithic

15:00 – 15:30 *Bárbara Rodríguez Álvarez, Jordi Rosell Ardèvol & Jordi Serangeli Dalmau*
An analysis of chaînes opératoires in Schöningen as a case study to be compared with other Paleolithic sites

15:30 – 16:00 *P. Haesaerts, P. Spagna, F. Damblon & D. Bosquet*
New insight on the chronostratigraphic background of the Haine terraces system (Belgium), with special attention to Middle Palaeolithic laminar assemblages between 280 and 80 ka

16:00 – 16:30 *Berrin Çep & Susanne C. Münzel*
Heidenschmiede, a Middle Palaeolithic Rockshelter in Heidenheim. Lithics, Fauna and AMS dating

16:30 – 17:00 *Berrin Çep, Jens Axel Frick & Benjamin Schürch*
Reevaluation of the site Große Grotte near Blaubeuren, Swabian Jura, Germany

- Coffee break -

17:30 – 18:00 *Christoph Wißing, Hélène Rougier, Isabelle Crevecoeur, Dorothée Drucker, Mietje Germonpré, Yuichi I. Naito, Cosimo Posth, Patrick Semal & Hervé Bocherens*
Isotopic insights into the paleoecology (diet, mobility) of late Neandertals in North-West Europe

18:00 – 18:30 *Juan Manuel López-García, Alessandra Livraghi, Matteo Romandin & Marco Peresani*
Environmental and climatic reconstruction of the Neanderthal site of De Nadale cave (Zovencedo, Berici Hills, Northeastern Italy) through the small mammal assemblages

18:30 – 20:00 **Poster Session**

20:00 **Evening Reception**

Wednesday, April 4th

Special Session:
"Neanderthal behaviour and ecology in the Mediterranean area"

09:30 – 10:00 *Carlos Sánchez-Hernández & Florent Rivals*
Mediterranean vs. Atlantic: Ecological niches of ungulate preys in the Iberian Peninsula during the Middle Paleolithic

10:00 – 10:30 *Hervé Bocherens, Dorothée G. Drucker, Camille Daujeard, Jean-Paul Raynal & Marie-Hélène Moncel*
Eemian Neandertal ecology in Mediterranean southeastern France: Isotopic evidence

10:30 – 11:00 *Abel Moclán, Rosa Huguet, Belén Márquez, César Laplana, Nuria García-García, Diego Álvarez-Lao, Alfredo Pérez-González, Juan Luis Arsuaga & Enrique Baquedano*
Pinilla del Valle sites: new preliminary data to understand Neanderthal-carnivore interaction in the Iberian Plateau

- Coffee break -

11:30 – 12:00 *Juan Marín, Palmira Saladié & Antonio Rodríguez-Hidalgo*
Neanderthal subsistence strategies at Abric Romaní

12:00 – 12:30 *L. Montes, R. Domingo, M. Roy, J. Martínez-Moreno, R. Mora & P. Utrilla*
Tracing the Neanderthal life history from the Pyrenean Sierras Marginales and Exteriores (SME) (Northeast of Iberia). I-Landscapes and settlement patterns during Early Upper Pleistocene (MIS 6-MIS 3)

12:30 – 13:00 *J. Martínez-Moreno, M. Roy, L. Montes, R. Domingo, P. Utrilla & R. Mora*
Tracing the Neanderthal life history from the Pyrenean Sierras Marginales and Exteriores (SME) (Northeast of Iberia). II-Behavioral Middle Paleolithic trends during Early Upper Pleistocene (MIS6 - MIS3)

- Lunch break -

14:30 – 15:00 *C. Mazo, P. Utrilla, M. Bea & M. Alcolea*
Peopling the Iberian System with Neanderthals: current state and new insights

15:00 – 15:30 *Jordi Rosell, Ruth Blasco, Anna Rufà, Carlos Sánchez-Hernández, Maite Arilla, M. Gema Chacón, Andrea Picin, Miriam Andrés, Iván Ramírez, Paula Mateo, Guillermo Bustos, Mónica Fernández, Leandro Zilio, Heidi Hammond, Juan Manuel López-García, Hugues-Alexandre Blain, Elisa Luzi, Diego J. Álvarez-Lao, Carlos Tornero, Bruno Gómez de Soler, Sahra Talamo & Florent Rivals*
Inside the secrets of Teixoneres Cave (Moià, Barcelona, Spain): An example of a multidisciplinary approach applied to a Neanderthal site

15:30 – 16:00 *Jose Ramos-Muñoz, Pedro Cantalejo, Serafin Becerra, Viviane Bolin, Lidia Cabello, Salvador Domínguez-Bella, María del Mar Espejo, Diego Fernández-Sánchez, Martin Kehl, Trine Kellberg Nielsen, Nicole Klasen, Adolfo Moreno-Márquez, Yvonne Tafelmaier, Eduardo Vijande-Vila & Gerd-Christian Weniger*
Middle Palaeolithic Occupations at Cueva Ardales and Sima de Las Palomas de Teba, Málaga

- Coffee break -

16:30 – 17:00 *M.C. Stahlschmidt, N. Nir, N. Greenbaum, T. Zilberman, O. Barzilai, R. Ekshtain, A. Malinsky-Buller, E. Hovers & R. Shahack-Gross*
Neanderthals in the Open – Depositional Environment and Site Formation at 'Ein Qashish, Israel

17:00 – 17:30 *Michael Walker, María Haber Uriarte, Mariano López Martínez, Jon Ortega Rodrigáñez, Antonio López Jiménez, Azucena Avilés Fernández, Consuelo Martínez Caravaca, Gonzalo Linares Matás, Hugo Cano Fernández, Norman Fernández Ruiz, Jesús García Torres & Ángel López Buitrago*
Neanderthal activities between ~130 ka and ~40 ka at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

17:30 – 18:00 *Juan I. Morales, Artur Cebrià, Antonio Rodríguez-Hidalgo, María Soto, Gala García-Argudo, Juan L. Fernández-Marchena, Aitor Burguet-Coca, Carolina Cucart-Mora, Diego Lombao, Sandra Bañuls-Cardona, Adrià Escuté, Marc Pey, Josep Vallverdú & Josep M. Fullola*
Late Middle and Early Upper Paleolithic occupation of the Mediterranean Penedès (Catalonia, Spain). First notes about newest excavations

19:30 **Public evening lecture by María Gema Chacón Navarro and Florent Rivals "Travelling with Neanderthals through the northeastern Iberian Peninsula"**

21:00 **Conference Dinner at the Restaurant Mas Roselló**

Thursday, April 5th

Reports on the Middle and Upper Palaeolithic and Mesolithic

09:30 – 10:00 *Elaine Turner & Petr Neruda*
Bone retouchers and other bone tools from Last Interglacial deposits at Kůlna Cave, Level 11

10:00 – 10:30 *Giulia Toniato, Britt M. Starkovich & Nicholas J. Conard*
Middle and Upper Palaeolithic settlement dynamics in the Lauchert Valley of the Swabian Jura: report on the faunal assemblages and new excavation results

10:30 – 11:00 *Zsolt Mester, Sándor Józsa, György Lengyel, Ágnes Novothny, Norbert Faragó, Piroska Csengeri, László Domboróczki, Mónika Gutay & József Szeberényi*
Diachronic study of human behaviour in lithic resource management: a research project from northern Hungary

- Coffee break -

11:30 – 12:00 *Keiko Kitagawa & Nicholas J. Conard*
The Swabian organic technology of the Aurignacian: Preliminary results

12:00 – 12:30 *Dorothée G. Drucker, Yuichi I. Naito, Neus Coromina, Joaquim Soler & Narcís Soler*
Human diet during the Gravettian in northeastern Iberian Peninsula: insights from stable isotopes

12:30 – 13:00 *Petr Neruda, Zuzana Patáková, Grzegorz Pyka, Nela Doláková, Šárka Hladilová & Martin Oliva*
Universe Inside Dolní Věstonice Venus

- Lunch break -

14:30 – 15:00 *Sebastian J. Pfeifer, Frank A. Müller & Wolfram L. Hartramph*
The elephant in the room. A materials scientific approach to explain the role of Proboscidean ivory for Late Glacial societies

15:00 – 15:30 *Gillian L. Wong, Britt M. Starkovich & Nicholas J. Conard*
Human Subsistence and Environment in the Lone Valley of Southwestern Germany during the Magdalenian

15:30 – 16:00 *Javier López*
New results considering the production process of fine figural lines on an engraved bâton percé from Laugerie-Haute Est

16:00 – 16:30 *Florian Sauer, Christian Hoggard & Felix Riede*
Preliminary results on the search for new Late Glacial rock shelter-sites in the Federal State of Hesse

- Coffee break -

17:00 – 17:30 *María Clara López Sosa*
Endocranial Morphological Affinities of the Early Holocene Individuals from Lagoa Santa and Implications for the Settlement of the Americas

17:30 – 18:00 *Benjamin Spies*
Borders, groups and territories - The Early Mesolithic in southern Germany

18:00 – 18:30 *Martin Oliva*
Specificities of the Moravian Mesolithic

18:30 – 19:00 *Katarína Kapustka*
Variability of quartz exploitation during the Mesolithic in the Sabaloka region

19:15 **Society's annual general assembly**

21:00 **Get-together and dinner at the Restaurant L'Ancora**

Poster presentation

Julia Blumenröther
The Mesolithic in the Austrian Danube corridor

M. Gema Chacón, Juan Marín, Palmira Saladié, Josep Vallverdú, Bruno Gómez de Soler, Francesca Romagnoli, Amèlia Bargalló, M. Joana Gabucio, María Soto, Gerard Campeny, Antonio Pineda, Antonio Rodríguez-Hidalgo, Edgar Téllez, Aitor Burguet-Coca, Isabel Expósito, Cristina Val-Peón, Francesc Burjachs, Ethel Allué, Alex Solé, Florent Rivals, Carlos Tornero, Carlos Sánchez-Hernández, Mónica Férnandez-García, Juan Manuel López-García, Manuel Vaquero & Eudald Carbonell
Living at the same place for more than 60 000 years: What happened at the Abric Romaní site (Capellades, Barcelona) during the Middle Paleolithic?

Davide Delpiano
One, No One and One Hundred Thousand: a techno-functional reassessment of backed tools from Sesselfelsgrotte G-complexes

Javier García-Vadillo, Antoni Canals Salomó, Xose-Pedro Rodríguez Álvarez & Eudald Carbonell Roura
The lithic assemblage of "Sala de los Huesos" from Maltravieso Cave (Cáceres, Spain) as a result of the interaction between Neanderthals and hyenas

P. Haesaerts, Ph. Nigst, F. Damblon, Ch. Frank-Fellner & G. Trnka
Stratigraphic background and radiocarbon chronology of Early Aurignacian layer 3 at Willendorf II (Lower Austria)

Małgorzata Kot, Natalia Gryczewska, Magdalena Krajcarz, Maciej Krajcarz, Magdalena Moskal-del Hoyo & Michał Wojenka
Koziarnia Cave. Jerzmanowician site revisited

Valentina Lubrano, Matteo Romandini & Marco Peresani
Hunting behavior of Late Neanderthals in the North-east of Italy. Results from zooarchaeological analysis of unit II assemblage of Grotta Maggiore di San Bernardino (Berici Hills, Vicenza)

Lumila Menéndez
A quantitative sex determination analysis based on cranial variation of South American populations

Taylor Otto & Gerd-Christian Weniger
Land Use in the Middle Palaeolithic of the Eastern Rif – Sites, Settlement Pattern and Mobility

Jesper B. Pedersen, Martin E. Poulsen & Felix Riede
Jels 3 – a new Hamburgian locale near the Jels lakes

Katarzyna Pyżewicz & Zdeňka Nerudová
Brno-Štýřice III Paleolithic site – a microwear approach to the recognition function of the lithic tools

Awardee of the Hugo Obermaier Research Grant 2018

Senka Plavšić

Project description
Excavation project of Meča Dupka cave site in south Serbia has a goal to study late Middle Paleolithic presence and the emergence of the Upper Paleolithic in the Balkans. The main goal of research is to contribute to the knowledge of late Neanderthal populations and early *Homo sapiens* dispersal in Europe.
Middle to Upper Paleolithic transition has been widely discussed topic in Paleolithic research, and Balkans in particular represent an important region for studying this transition. It has been suggested that Balkan region was a refugium for late Neanderthal populations. Furthermore, some of the industries with early Upper Paleolithic characteristics have been identified in the Balkans. This project will, thus, address the following questions: Does Southeast Serbia contain remains of the early Upper Paleolithic? Is there a possible corridor connecting Bulgarian early Paleolithic sites to Western Europe? Did Neanderthal populations survive in the refugium in the central Balkans? Did Neanderthal populations prevent AMH from settling in some parts of the Balkans and if so, where can the line be drawn?
The project will include excavations on the Meča Dupka cave site in Southeast Serbia. The site is located in the region that, for now, represents a line that separates early upper Paleolithic sites in eastern Serbia and late Middle Paleolithic sites in south Serbia. The interdisciplinary approach will include analysis of the postdepositional processes using artifact orientations, dating of the layers, analysis of the lithic artefacts and pollen analysis that will be conducted as part of the project. Using results from these analysis, the goal is to obtain a comprehensive data of environment and populations that inhabited Meča Dupka during the Paleolithic.

Abstracts of Reports and Posters

Julia Blumenröther

The Mesolithic in the Austrian Danube corridor

The Mesolithic period is among the most unexplored phase in the archaeological research of Austria, particularly in the Danube corridor. Since the 1990s only few papers of Mesolithic sites in these areas based on excavations of the 1950s/60s and collectors' material were published (e.g. Gulder 1953; Antl-Weiser 1986; Nutz 2006).
A further complicating matter is the fact that the so-called Beuronian – whereof the Austrian Mesolithic is said to be a part of – has been defined differently in different areas since the 1970s (e.g. Rozoy 1967; Taute 1971; Kozłowski 1984, 2009), making direct comparisons of Mesolithic artefacts between sites in Bavaria, the Czech Republic, Austria or Hungary rather difficult.
During the last years, however, several research projects concerning the Mesolithic have been conducted or started in different regions of Central Europe. In the Czech Republic and Southern Germany (especially Bavaria), for instance, the picture of Mesolithic hunter-gatherer lifeways has become much clearer (Graf 2015; Richter 2017). These advances in Mesolithic research offer a good opportunity to reconsider also the situation in the Austrian Danube corridor and to reevaluate the chronological and chorological structuring of the Mesolithic record in this area of Central Europe.
The aim of this PhD project is thus to gain a clearer picture of the Mesolithic hunter-gatherers in the Austrian Danube corridor as well as their relation to neighboring groups by analyzing data on lithic raw material, technology and typology and to work out a comprehensive overview of the archaeological record of this period. Additionally, data on faunal remains, palynological archives and other environmental and paleoclimate data are compiled to assess the role of the environment, particularly the effects of atlantic and continental conditions especially on the border of the rather arid Weinviertel and the rather humid Waldviertel in the Kamptal, where both climate conditions collide. These conditions, which presumably have impacts on the network structure of Mesolithic hunter-gatherer groups, will be analyzed with GIS and ecological models to reconstruct the Mesolithic environment and interactions of climate, ecosystems and social behavior.

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Hervé Bocherens[1,2], Dorothée G. Drucker[2], Camille Daujeard[3], Jean-Paul Raynal[4,5] & Marie-Hélène Moncel[3]

Eemian Neandertal ecology in Mediterranean southeastern France: Isotopic evidence

The palaeoecological context of a mixed Neandertal-Carnivores Eemian occupation in southern France (Baume Flandin) was investigated using isotopic tracking on faunal bones. Carbon, nitrogen and oxygen isotopic measurements were performed on bone collagen and tooth enamel carbonate. The carbon isotopic ratios measured on herbivorous and predatory species, including prey species of humans (bones with cut-marks) and non-human predators, were converted into ecosystem carbon isotopic ratios (Fig. 1). They indicated a mixture of open forests and more open landscapes. Therefore, in the study area, the Eemian Mediterranean vegetation was probably not as densely forested as suggested by pollen records for this period and the cervid species such as roe deer and fallow deer were not necessarily forest dwellers. Non-human carnivorous species reflect quite a large range of foraging areas, from very open fields for the Hyena to forested for the Lynx. Individuals of the prey species exploited by Neandertals (mainly Red deer, Roe deer and Horse) in Baume Flandin also fit a various range of habitat, from forest ecosystem to open landscapes, raising the possibility of dietary competition with other predators

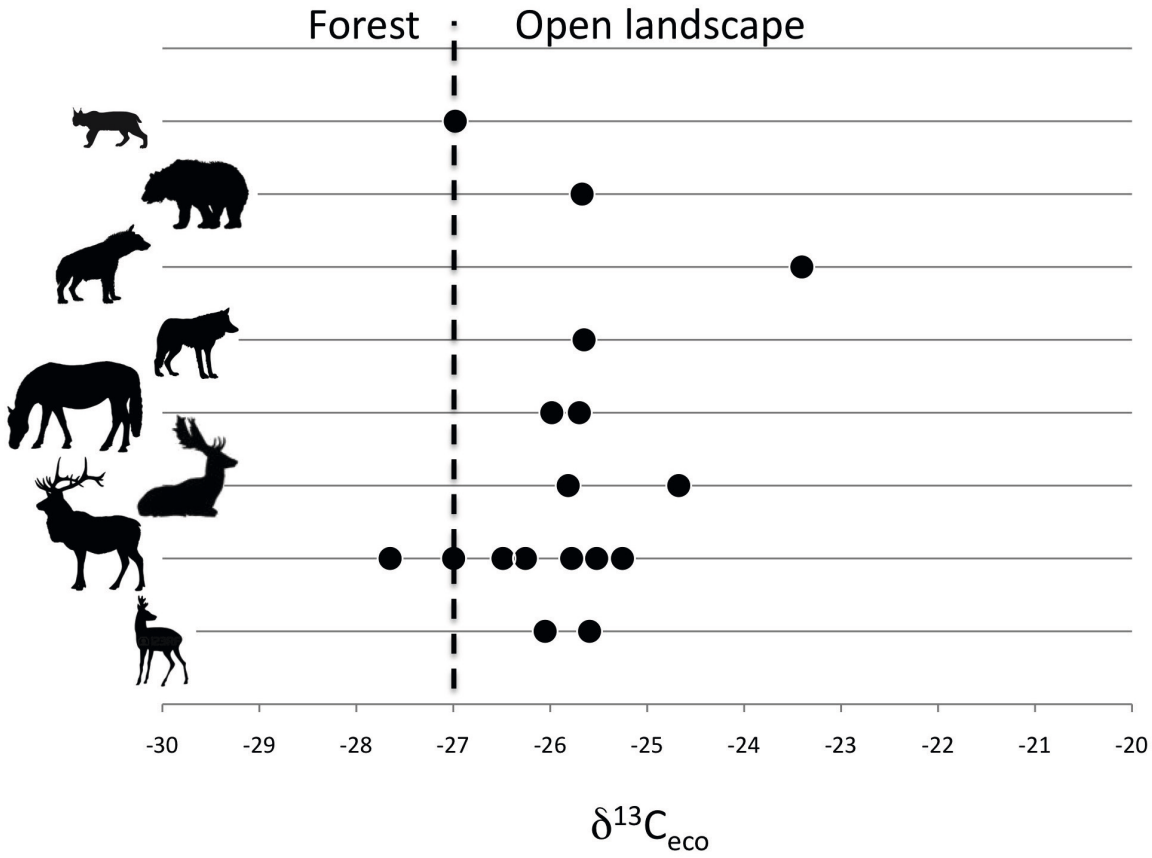

Fig. 1. Ecosystem carbon isotopic ratios indicating a mixture of open forests and more open landscapes for the Eemian in southern France.

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Berrin Çep, Jens Axel Frick & Benjamin Schürch

Reevaluation of the site Große Grotte near Blaubeuren, Swabian Jura, Germany

Almost every discussion referring to the Große Grotte is based on the analyses presented by Wagner (1983). A work that can be considered obsolete as early as the publication date, since it represents the publication of a dissertation from 1968. Wagner has already struggled with the fact that not all findings during the excavation by Riek (1959-1961 and 1964) were documented and Riek (1962) wrote of sediment reallocation during the course of the excavations.
Although the site was dug in natural layers using a square-meter system, Wagner was not able to allocate all finds to square metres and layers. This fact became evident above all through new analyses of stone artifacts in the late 1990s by one of the authors (Çep 2000; Çep & Waiblinger 2001). Fauna analyses (Weinstock 1999) also yielded new insights in terms of stratigraphic conditions of the site, as it was possible to refit bones with different layer designations. Recently, the so-called skull-cup from a reindeer calvarium (Riethmüller & Floss 2016) and its integrity was strongly questioned. So far, we only know one AMS ^{14}C date from the site, a red deer mandible from layer II that resulted in an age of the roman imperial period.
Layer II is often assigned to the Blattspitzengruppen due to the alleged presence of two leaf points (Wagner 1983). This layer also contained the well-known but unfortunately incomplete bone tip, which was already CT-scanned (Gröning et al. 2007). On the other hand, the layers (III-XI) underneath are assigned to the "Swabian Moustérien" (e.g., Bolus 2015). According to Schäfer (1993), the layers cannot be distinguished from each other (except layer X) due to the very high similarity of technological characteristics of lithic blanks.
Our goal is to re-evaluate the site and its assemblages based on all available existing documentation and new analyses of the stone artifacts and the stratigraphic conditions. Concerning the stone artifacts, the focus is on core reduction, blank production and the production of bifacial objects. Attached is an attempt to assign certain artifacts to square meters and layers so that density estimates of assemblage components can be made.

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Heidenschmiede, a Middle Palaeolithic Rockshelter in Heidenheim. Lithics, Fauna and AMS dating

Heidenschmiede is one of the most important Middle Palaeolithic sites of the Swabian Jura. Among numerous cave sites, it is the only rockshelter with Middle Palaeolithic finds. It is said that the first "Faustkeil" of Baden-Württemberg was found here.
The rockshelter is situated ca. 540 m asl within the city of Heidenheim on the western bank of the Brenz Valley and at the foot of a Jurassic rock just below Schloss Hellenstein (Conard et al. 2015).
The site was discovered and excavated in 1928 by the amateur researcher Hermann Mohn. Later in 1930 Eduard Peters from the Landesdenkmalamt, Baden-Württemberg, was requested to complete the excavation. Peters hardly found any sediment and only a few finds were left. H. Mohn´s profile block didn´t exist anymore and his documentation was not informative at all (Peters 1931).
Peters counted about 2000 stone artefacts and 8 kg of faunal remains. According to the typological features he considered the existence of Acheulian, Moustérien and Mesolithic assemblages within the sequence of Heidenschmiede. The lithic material was later viewed by H. Müller-Beck and G. Bosinski (Müller-Beck 1956; Bosinski 1967). Both authors assumed that only various Middle Palaeolithic assemblages from several visits existed, whereby in G. Bosinski´s opinion, only the Micoquien can be clearly specified.
The faunal remains were first studied by Fritz Berckhemer from the Natural History Museum in Stuttgart with the help of Florian Heller for the microfauna and Kálmán Lambrecht for the avifauna. The species list includes mammoth, rhino, horse, reindeer (with horse and reindeer dominating), wolf, fox, hare, marmot, lemmings, and several birds. Human activities were also documented by 2 bone retouchers and a large amount of charred bones of considerable size (Peters 1931).
The re-analysis is based on 3055 bones with a total bone weight of 14kg stored in three different collections in Stuttgart and Heidenheim. The majority of the faunal remains is strongly weathered, thus 81% of the bones and over 45% of the total bone weight were only identifiable in size classes. Based on number and weight horse is the most important species, followed by reindeer. In contrast to the first analysis hyena and bear were identified in small numbers. Surprisingly, one bone, a hyoid, comes from a cave bear, not to be expected in rockshelters.
Several cut and impact marks could be documented, mainly on reindeer bones. Additional 5 bone retouchers (Fig. 1) were recognized in the assemblage and sum up to a total of 7 retouchers (Toniato et al. 2018). The proportion of human modifications for this small assemblage is relatively high.
Our presentation will give a preliminary report of our re-examination of the lithic and faunal material of the Heidenschmiede. We analyzed the lithic artefacts on technological and conceptual characteristics as well as on raw material use and functional issues. The site was visited with great certainty only during the Middle Paleolithic period. Almost exclusively local raw materials were used, predominantly local Jurassic silicious limestone, which Peters formerly described as "tertiärer Süßwasserkieselkalk". Local Jurassic chert, tertiary chert from the Steinheim Basin, as well as gravels from the nearby Brenz River (radiolarite, lydit, quarzite, Keuperhornstein and Muschelkalkhornstein) were processed. The assemblage consists of a small number of modified pieces, including few bifacial tool types, points, varying types of scrapers, a high number of retouched blades and flakes as well as some cores and numerous flakes and blades. The striking presence of blades from Levallois as well as from non-Levallois cores, has to be considered as a specific technological feature, which is unique for the Middle Palaeolithic of the Swabian Jura. For the blade production, primarily the local Jurassic silicious limestone (Kieselkalk) was preferred. The presence of nodules, exhausted cores and the gradual reduction of the preparation flakes and in particular several bone retouchers suggest that the knapping activities took place on-site. The technological features will be finally discussed when the analyses are completed.
Since we do not have any information about the interrelation of the faunal and lithic remains because of the inadequate excavation methods, radiocarbon dates will provide at least a

snapshot of the settlement activities of the site. Three bones with anthropogenic modifications were selected for AMS dating. We choose a reindeer tibia with cut marks, a horse metacarpal with impact marks and a retoucher made from a large bovid long bone. The lithic artefacts and the faunal remains suggest that the Heidenschmiede was a knapping site and hunting camp at least at a certain time during the Middle Paleolithic.

Fig. 1. Bone retoucher made of a large bovid's metacarpal with two scar areas, splintering of both ends and some scraping marks on the surface (photo by Yvonne Berardi).

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Living at the same place for more than 60 000 years: What happened at the Abric Romaní site (Capellades, Barcelona) during the Middle Palaeolithic?

High resolution assemblages in which palimpsest dissection is a feasible effort are particularly suitable for approaching the behavioral variability of Neanderthals populations. This high-resolution approach is enhanced when the analysis of archeological remains is coupled with a detailed spatial perspective allowing to put human activities into context.
The stratigraphy of the Abric Romaní site (Capellades, Barcelona) comprise 50 m of well-stratified travertine sediments dated by U-Series and ^{14}C dates between 40 and ~110 ka years old (Bischoff et al., 1988, 1994, Sharp et al. 2016, Vallverdú et al. 2014, Vaquero et al. 2013) and more than 20 archaeological levels. All the exposed and excavated archaeological layers correspond to the Middle Palaeolithic, except the uppermost level A, attributed to the Early Upper Palaeolithic.
The excavation of a large area (more than 200 m^2) combined with its sedimentary context (deposition of carbonate tufa with rapid sedimentary rates) and a high temporal resolution of the archaeological units has provided a snapshot of the spatial organization strategies and activities realized by the Middle Palaeolithic inhabitants.
The archaeological levels are thin sandy layers usually separated by thick and sterile tufa deposits, which considerably decrease the temporal depth of the palimpsests. These are the result of the accumulation of an unknown number of occupational events. The occupation models can be distinguished as long-term or short occupation residential events and/or non-residential events (Vallverdú et al. 2005, 2010, Vaquero et al. 2012; Marín et al. 2017).
In this paper we show a diachronically general overview of the Neanderthal behaviors identify at the site in the levels excavated until today. We present the multidisciplinary research carried out through the sequence that use different methodological approaches of diverse disciplines to reconstruct and interpret the archaeological assemblages and the activities associated with them from and spatial and temporal perspective.

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Davide Delpiano

One, No One and One Hundred Thousand: a techno-functional reassessment of backed tools from Sesselfelsgrotte G-complexes

Lithic knapping is the major process around which the manufacturing of domestic and hunting tools in the Paleolithic turns around; through the technical gestures, the knapping methods and the volumetric concepts, the production intended to meet certain needs and specific goals. Particularly important, in the techno-complexes of the final Middle Paleolithic, is the obtainment of artifacts having a blunt back opposed to a cutting edge, that means manually held knives.
In Keilmessergruppe techno-complex (KMG) the eponym tool, the *keilmesser*, is a bifacially knapped backed artifact; despite this, its own definition is at least vague and sometimes transitional with other bifacial forms like handaxes or bifacial scrapers. In this case the typology may result from the type of support, the available raw material, the use-life length and the degree of technical investment, all factors that may have conditioned the final form of the object. For this reason, a techno-functional approach can provide informations about the targets and usage schemes that KMG makers wanted to achieve.
This study present preliminary results on a Techno-functional reassessment of the G-Complexes lithic assemblages in Sesselfelsgrotte, known to be as a combination of KMG and

Mousterian aspects, with the *façonnage* of bifacial tools alongside Levallois and non-Levallois *débitage* method and microlithic tools. A sample of backed implements was considered, regardless of tools' typology or the presence of retouch; 3D scans of the artifacts were obtained in order to achieve deeper comprehension of morpho-metrical data and better interaction with techno-functional units (UTF) through cross-sections. Data on general morphology, active and passive UTF measurements, angles, profiles, origin and the relationships between the different UTFs have been registered.
Results indicate that *keilmesser*'s techno-functional schemes show a moderate variability and often overlap with other typological groups. Seven main schemes with variants were recognized on the backed artifacts, that helped to distinguish the required functionalities and the knappers' objectives. Some recurrent technical and conceptual behaviours were developed in order to their manufacturing, including different choices in the type of blank, the shape predetermination or post-determination, the retouch and the technical arrangements for the back.
Ultimately, many aspects must be treated, and a techno-morpho-functional approach in a broad sense can help to define these tools without disconnecting them from their context and considering that different methods can be configured to produce same or similar objectives. The crossing of data coming from use-wear analyses and experimental replications and use will be important in order to obtain information in terms of functional effectiveness and to fully understand the triggering causes of their production, the working operations and the required manual dexterity and lateralization.

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Human diet during the Gravettian in northeastern Iberian Peninsula: insights from stable isotopes

Stable isotope (^{13}C, ^{15}N) analysis of bone collagen has proved to be a useful tool in the reconstruction of the diet and environment of human populations in prehistoric context. It has been successfully applied on animal and human remains of the Gravettian period (ca. 27,000-23,000 years ago) across northwestern and central Europe to reconstruct the main source of animal protein. The main consumed prey differed between central Europe contexts, where the subsistence is mainly oriented on mammoth exploitation, and southwestern France and northern Italy, where a marine component was detected in the human diet. Developed more recently, the analysis of the ^{15}N abundances of specific amino acids, phenylalanine ($\delta^{15}N_{Phe}$) and glutamic acid ($\delta^{15}N_{Glu}$), can help to disentangle the respective intake of resources from terrestrial and aquatic ecosystems. Compound-specific ^{15}N analyses can also contribute to clarify the contribution of plants that is difficult to detect based on bulk collagen isotopic signature.
We have examined the late Gravettian trophic web reflected by bulk and amino acid isotopic signature from faunal and human remains of the Serinyà caves (Arbreda, Reclau Viver and Mollet III) in the northeastern Iberian Peninsula. Based on the bulk collagen $\delta^{13}C$ and $\delta^{15}N$ values, significant marine contribution could be ruled out from the diet of animal and human predators. Significant differences in direct radiocarbon date and/or in diet, as reflected by ^{13}C and ^{15}N abundances of bone collagen, point to a possible attribution of the four selected human remains to different individuals. The contrasted contribution of rabbit, horse and red deer to dietary protein from one potential individual to another reflect the access to a large range of food resources in this favourable region of the Mediterranean zone. The $\delta^{15}N_{Phe}$ and $\delta^{15}N_{Glu}$ values of the tested herbivores and carnivores are consistent with the expected trophic level in the context of a C_3 terrestrial ecosystem. Quantitative evaluation based on the $\delta^{15}N_{Phe}$ and $\delta^{15}N_{Glu}$ values of the human remains indicate a terrestrial dominated diet with a significant proportion of plant foodstuff. Possible contribution of freshwater resources appears relatively limited, but inter-individual contrasts that could not be detected using bulk collagen isotope analysis alone.
At the Serinyà caves, the results of the stable isotope analyses confirm the use of a large spectrum of food resources for human subsistence in relatively different proportions from

one potential individual to another, reflecting at a small scale the dietary flexibility of the Gravettian human groups.

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The lithic assemblage of "Sala de los Huesos" from Maltravieso Cave (Cáceres, Spain) as a result of the interaction between Neanderthals and hyenas

The rich archaeo-paleontological assemblage of "Sala de los Huesos" from Maltravieso Cave was a space frequented by hyenas and hominids in the upper-initial Pleistocene (117 +17/-14 Ka. y 183 +14/-12 Ka). Used as den, hyenas were the main accumulators of bones and they were depredated by hominids in the framework of low-impact occupations. In this work we will carry out a review of a lithic material assigned to Mode 3 resulting from the dynamics of interaction between hyenas and hominids. The main characteristics of this technology are the exploitation of quartz (probably available in the environment) and the use of quartzite percussion instruments (transported boulders) and quartz blocks (Fig. 1).

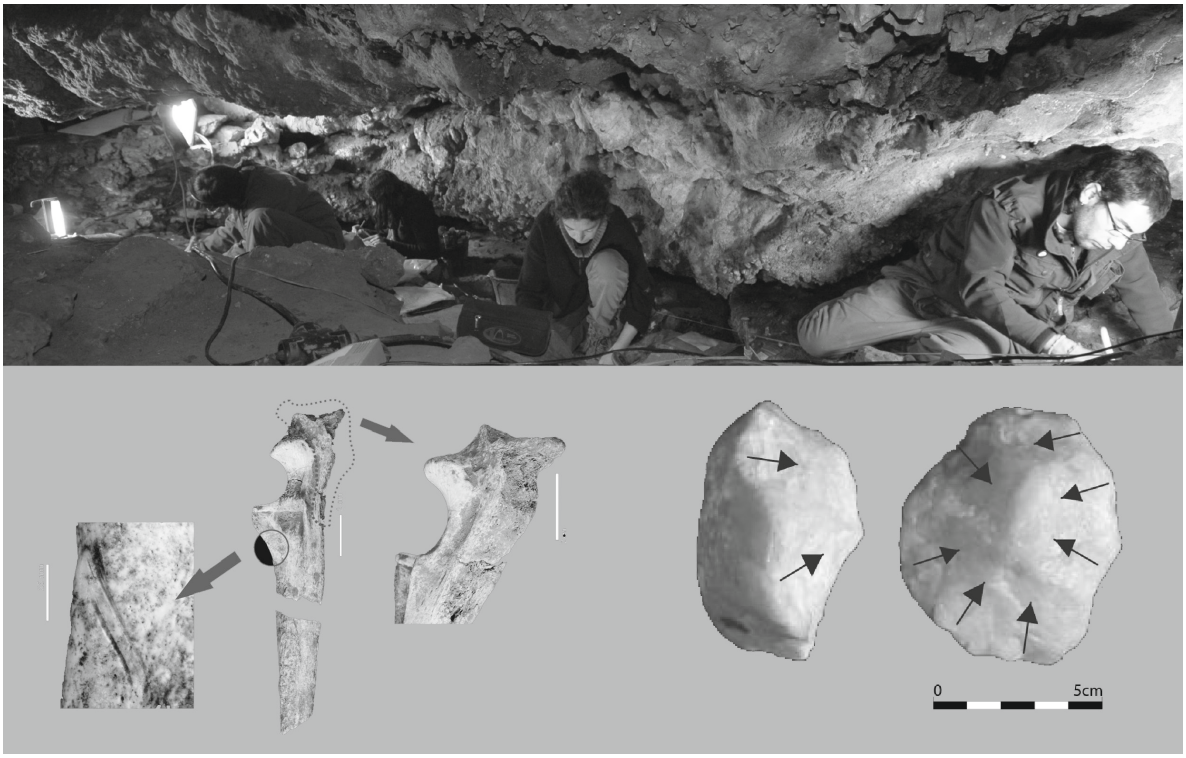

Fig. 1. Maltravieso Cave; upper: excavation in the cave, lower: organic and lithic finds.

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New insight on the chronostratigraphic background of the Haine terraces system (Belgium), with special attention to Middle Palaeolithic laminar assemblages between 280 and 80 ka

Initially the Middle Pleistocene fluvial deposits of the Haine Basin close to Mons (Belgium), did encompass four alluvial terraces between 78m (Pa d'la l'iau) and 45m (Hélin), associated with Lower and Middle Palaeolithic industries. In the seventies, the Mesvin terrace (around 59m) characterized by a well asserted Levallois technology (Mesvin IV), has been ascribed to MIS 8, based on elevation, biostratigraphic and chronological arguments; in the same way, the Petit-Spiennes terrace (at 68m) with Middle Acheulean and early Levallois technology was related to MIS 10. New data collected in recent years for the cover deposits of the Haine sequence and the occurrence of a complementary terrace at 50m between Hélin and Mesvin, led to improve the chronological framework of the terrace system. They are placing the gravels of the Petit-Spiennes and Mesvin terraces with the Levallois assemblages they contain, respectively at 450 ka (MIS 12) and 350 ka (MIS 10). This new scheme points to a long Saalian (from MIS 10 to MIS 6), in good agreement with the sequence of the Somme and the loess cover of Ariendorf in the Rhine valley, where the Holsteinian is well positioned in MIS 11, around 400 ka. We will also show how this new scheme allows a more precise chronostratigraphic positionning of the Middle Palaeolithic laminar assemblages from Middle Belgium and surrounding areas, between 280 and 80 ka.

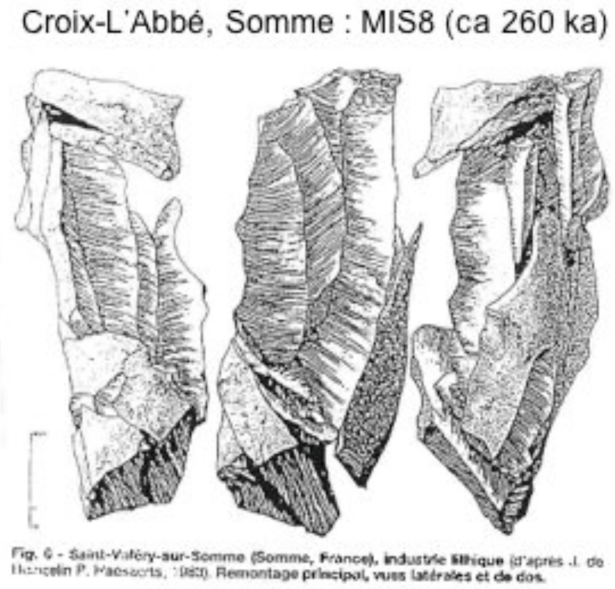

Fig. 6 - Saint-Valéry-sur-Somme (Somme, France), industrie lithique (d'après J. de Heinzelin P. Haesaerts, 1983). Remontage principal, vues latérales et de dos.

Fig. 1. Refittings of lithic artefacts attributed to MIS 8 and MIS 5c.

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Katarína Kapustka
Variability of quartz exploitation during the Mesolithic in the Sabaloka region

In this paper I would like to introduce the problematics of quartz knapping in central Sudan. The Sabaloka Mountains are situated at the Sixth Nile Cataract ca. 80 km downstream of the confluence of the Blue and White Niles. The mountains are of volcanic origin and thus feature many different kinds of rocks suitable for knapping. Mainly rhyolites are present in high quantities and different variants. The rhyolites were preferred during the Middle Stone Age and the Neolithic (*ca*. 5,000–3,000 BC). The Upper Palaeolithic is not known very well in this region. For the Mesolithic (*ca*. 9,000–5,000 BC), on the other hand, the lithic collections are dominated by quartz. When rhyolites were used, it was not very often and was only in low quantities.
Quartz is one of the hardest knappable rocks and its diacritic reading is often difficult. In many cases its knapping process is seen as simple and restricted by the characteristics of the rock. But based on the information provided by the collections from the Sabaloka region, the knapping of quartz pebbles could be a variable and really sophisticated process.
Until today the lithic analysis has been carried out mostly on the material from two core sites: Fox hill (SBK.W-20) and Sphinx (SBK.W-60). Sphinx is a purely Mesolithic site, with quite a restricted habitable area of 940 square metres. Fox Hill, on the other hand, is much more complex as it contains different components. The most significant are the Mesolithic and the Neolithic finds. But also the Middle Stone Age has been identified and there may be some Upper Palaeolithic material too. As the concentration of finds is sometimes over 3,500 pieces per square meter for the surface layer and dozens of square metres were excavated, only a sample of the lithic material was subjected to processing. Special attention was paid to intact archaeological features and layers from the Mesolithic period, from which either whole assemblages or majority of finds (in the form of samples) have been processed. Until now, the processing involved approximately 40,000 pieces from Sphinx and about 20,000 pieces from Fox Hill.
Here I would like to present the sequences of quartz working which are, as far as we know, associated with the Mesolithic. Two basic forms of quartz are present in the region: vein and pebble. The pebble one was the more popular, although sometimes it is difficult to differentiate between the two variants. At Fox Hill, we uncovered a smaller pit filled with quartz pebbles (*Feature 70*), this feature is possibly Mesolithic, but we do not have C^{14} dates yet, so Neolithic age cannot be excluded. More than 8 kg were obtained from this feature, which is a number much higher than in other parts of the excavated area. This feature can be interpreted as a deposit of discarded pieces of raw material. Interestingly, at least one third of all the untouched pebbles is burnt, in addition there are many pieces which were tried once or twice, but were discarded because of their insufficient quality.
The majority of quartz tools could be used for different activities, the typical tools are crescents, lunates, denticulates. Crescents predominate clearly, they usually constitute at least 50 % of all the tools in the collection. Much lower is the percentage of tools which were intended for a specific activity (scrapers, burins, borers). Microliths are also present in the collections but rather in low quantities. Nevertheless, the analysis of the lithics from Sabaloka is still preliminary.
Crescents were usually made on blanks in the form of flakes which were often produced by the slicing method (*Dittrich 2011*). This method is present in the studied region, but it is not the only one. To start from the very beginning, the two main types of fracture which are usually seen in lithic collections are clearly present in the studied material. There is evidence for bipolar flaking (as described by *Drift 2012*) and also for conchoidal fracture (*Tixier et al. 1999*). Bipolar flaking is usually done clearly on an anvil, of which one rare specimen has been found. With conchoidal fracture, there are different methods which were used. As

mentioned above, the slicing method is present (*Dittrich 2011*). There is also evidence of direct hard percussion which could be presumed with rocks of the qualities of quartz. These knapping methods are typical of quartz working all around world and their objective is flake production. But in addition to this there is running blade or rather bladelet production as well. It is minority for sure. But it is very interesting. These small bladelets have very carefully prepared platforms, as the knapped raw material is rather grainy and it seems that they are the result of indirect percussion, or maybe even pressure. The regularity of final pieces is rather diverse, but the objective of bladelet production from quartz pebbles is clearly there.

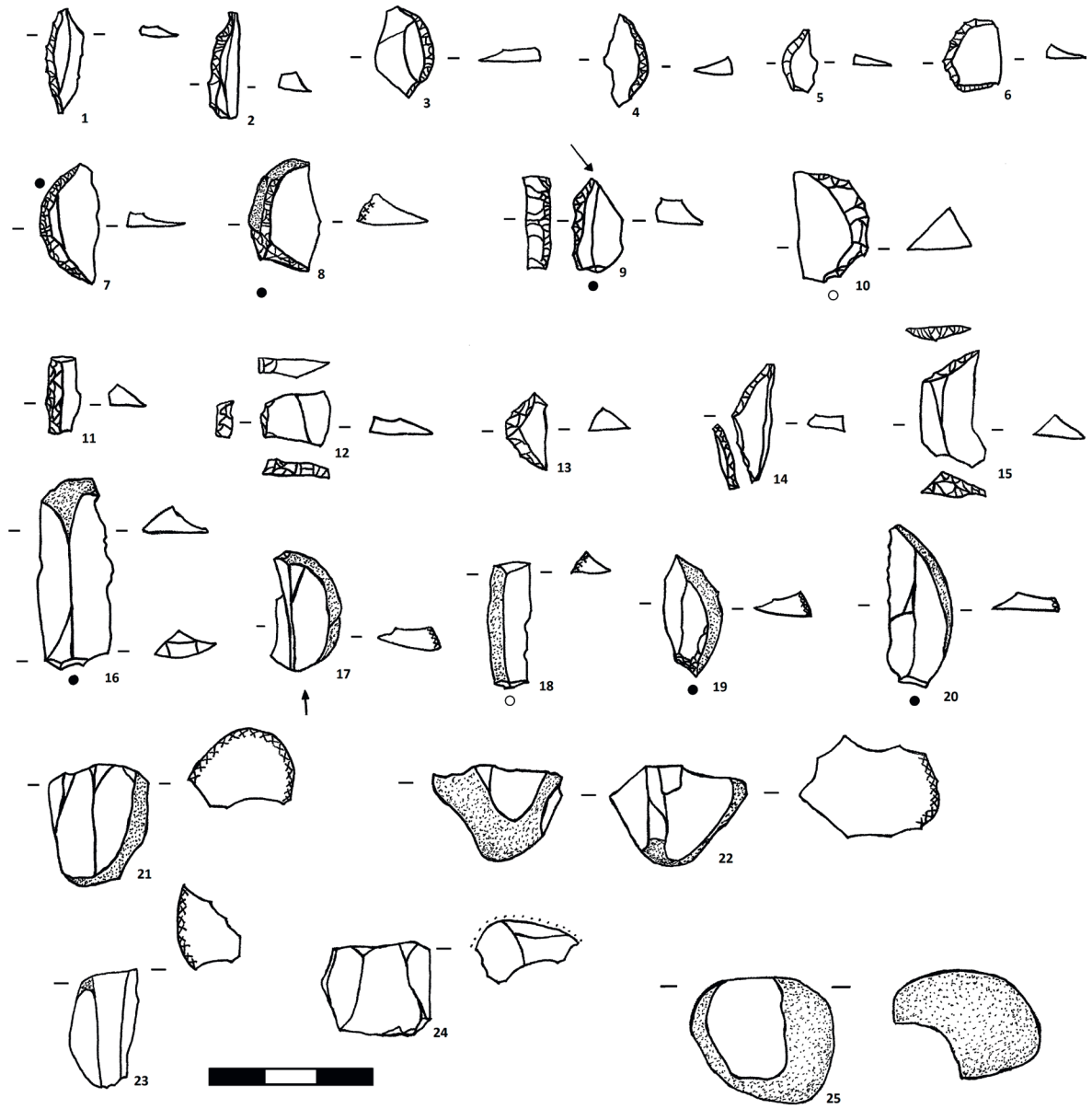

Fig. 1. Chosen quartz Lithics from Mesolithic site Sphinx. 1–7, 9–15: tools typical for the Mesolithic period, especially numerous are crescents (3–7, 10), 8: Halffinished product, retouched starte dat the bazal part of the blank, but not finished up to the terminal one, 16–20: blanks for tool production, blades and flakes for crescents, 21–25: cores, 21 and 23 bladelet cores, 22 and 24 flake cores, 25 tested pebble.

Acknowledgements:
Sincere thanks are owed to the National Corporation for Antiquities and Museums of the Sudan for the long-term support granted to the Sabaloka (West Bank) Research Project. The present paper forms part of the Communities and resources in late prehistory of Jebel Sabaloka, central Sudan: from analysis to synthesis, a research project (no. 17-03207S) supported by the Czech Science Foundation (GA ČR).

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Keiko Kitagawa [1,2] & Nicholas J. Conard [2, 3]
The Swabian organic technology of the Aurignacian: Preliminary results

The long research history in the Swabian Jura led to the recovery of early and notable archaeological record of the Aurignacian culture. Organic artifacts, which represent one of the important and innovative technological developments associated with modern humans, are outstanding for their richness and diversity. Here, we provide initial insights into some of the utilitarian tools manufactured from antlers, bones, and ivory. The increase in alters and reindeer correlates with the emergence of antler points. Split-based points, which have served as a chronological and cultural marker (fossil directeur) for the Aurignacian culture, as well as massive-based points, have been recovered at three main sites: Vogelherd, Geißenklösterle, and Hohle Fels. Vogelherd has the highest concentration of antler points in this region highlighting the diverse activities practiced in the site relating to hunting and processing. Hohle Fels shows few points produced from ivory, which remains unique in the region and in Europe. The Swabian organic technology exemplifies diversification and specialization of hunting tools associated with the economic activities of modern humans.

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Koziarnia Cave. Jerzmanowician site revisited

Koziarnia cave is one of a few Jerzmanowician sites in Poland. It is located in Sąspów Valley in the southern part of Polish Jura. The cave has a 5-metre high entrance heading SW with the main chamber of over 100 sqm behind it and a single 40-metre long corridor narrowing till the end of the cave.
The cave has been continuously used till World War I. In the second half of the XIX century Oscar Grube, local businessman excavated cave sediments which he claimed contained a "bat guano" and sold it as a fertilizer. During his works in the cave, the very end of the cave corridor has been almost cleared of the sediment and the original sediment level in the whole main corridor lowered by around 1 m. During his exploitation he found multiple Prehistoric animal bones and artefacts. These discoveries made Ferdinand Römer, geologist and palaeontologist from Wrocław University interested in the findings. F. Römer studied

artefacts and requested O. Grube to conduct a separate fieldwork by digging "trenches" in order to collect artefacts. The results were presented by F. Römer in 1883. One of the artefacts presented by F. Römer is a leafpoint made on blade (Fig.1).
Waldemar Chmielewski, excavated Koziarnia in 1956-1963 in order to determine the Jerzmanowician horizon. He opened 10 trenches of 120 sqm in total. Most of the sediments in the main chamber were already destroyed due to the previous modern activities. The undisturbed layers were found as far as 20m from the cave entrance. Chmielewski described the cross section with 22 separate geological layers. Several of them contained flint artefacts. However none of them contained artefacts which could be clearly described as Jerzmanowician assemblage. One of the layers (No 13), which he claimed to be sterile from archaeological point of view was black coloured due to the huge amount of charcoals. Chmielewski called it a cultural layer and by comparison to Nietoperzowa cave layer 4 and 6, he suggested it to be originally a Jerzmanowician horizon.
In 2017 a new fieldwork project has started which aims at establishing the chronology of the main archaeological cave sites in Sąspów Valley. One of such sites is Koziarnia cave. Testing trench was opened in a vicinity of trench IX by Chmielewski, 40 m from the cave entrance. The fieldworks aimed at checking the stratigraphy and taking samples for chronostratigraphical analyses. The paper presents the obtained results with a comparison to the results obtained previously by Chmielewski.

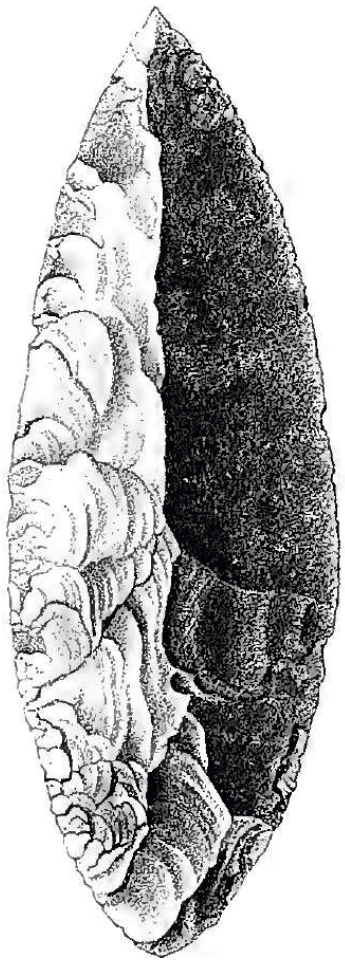

Fig. 1. Leafpoint found in Koziarnia cave by F. Römer (1883, Taf. XXII,7)

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Javier López

New results considering the production process of fine figural lines on an engraved bâton percé from Laugerie-Haute Est

In 2017, an engraved bâton percé on reindeer antler from the Magdalenian layers of Laugerie-Haute Est, stored at the prehistoric collection of the Institute of Prehistoric Archaeology of the Friedrich-Alexander-Univetsität Erlangen-Nürnberg (Geer 1971), was analyzed during a Bachelor thesis. The main motive is that of two horses facing each other (Fig. 1).
Using a Canon EOS 100D camera and a Dino-Lite AM4515ZT microscope, the object was documented photographically on macroscopic and microscopic scales. Using Structure from Motion (Jebara 1999), the pictures were combined to a 3D-representation of the artifact. The analysis of the documented engravings was done using DStretch® (Le Quellec et al. 2015) and revealed a number of previously undocumented lines, belonging to and complementing the main motive. Besides the previously known v- or u-shaped engravings, another kind of lines with a rather flat base has been identified. These lines are often part of the details, such as the horses' skin or hair, or are found in parts, where the composition of curved lines has to fit exactly on a curved surface, for instance the horses' legs, or where short lines are combined and overlap, for example the thighs. Revealing with regard to the production process of several of these flat-based lines were fine, superficial patterns of grids and parallel lines, which could be observed at different parts of the bâton percé. It seems that the Magdalenian artisans started by cutting fine and rather superficial patterns in those areas, where fine, but accurate lines should occur. These patterns generate an area of adjacent squares and rows. Afterwards, the selected rectangles or rows are cut or carved out parallel or diagonally, resulting either in fine lines with a jagged outline (rectangles), or parallel rows allowing for a controlled shaping of small areas and details.
Future research on different objects and other materials will reveal whether or not this is a general way of pretreating surfaces before starting the actual engravings.

Fig. 1. The bâton percé from Laugerie-Haute Est, digital orthophotography.

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Juan Manuel López-García[1,2], Alessandra Livraghi[3], Matteo Romandini[4,3] & Marco Peresani[3]

Environmental and climatic reconstruction of the Neanderthal site of De Nadale cave (Zovencedo, Berici Hills, Northeastern Italy) through the small mammal assemblages

De Nadale cave, located at an altitude of 130 m a.s.l. in the Berici Hills in northeastern Italy, is a site with a single archeological layer (Unit 7). Unit 7 is formed by dark brown-gray silt loam with crumbly soil structure and medium-small sized stones and has yielded a deciduous Neanderthal tooth, a large mammals assemblage mainly composed by herbivores, such as giant deer (*Megaloceros giganteus*), red deer (*Cervus elaphus*) and bovids (*Bos primigenius* and *Bison priscus*) with scarce carnivores. Knapped stone assemblage in association to the abundant bone tools recovered during four field-work seasons from this layer hasbeen attributed to the Quina-Mousterian culture. Then, a data has been obtained based on Uranium series (U-Th) on a bison tooth providing a minimum age of 70.2 +1/-0.9 Ka for this Unit 7. In this context we present for the first time a palaeoenvironmental and palaeoclimatic reconstruction of this layer based on small-mammal assemblages. This assemblage includes a total of 201 identified specimens, corresponding to a minimum of 112 individuals, representing at least 13 taxa (Fig. 1A): 4 insectivores (*Talpa europaea*, *Sorex* gr. *araneus-samniticus*,

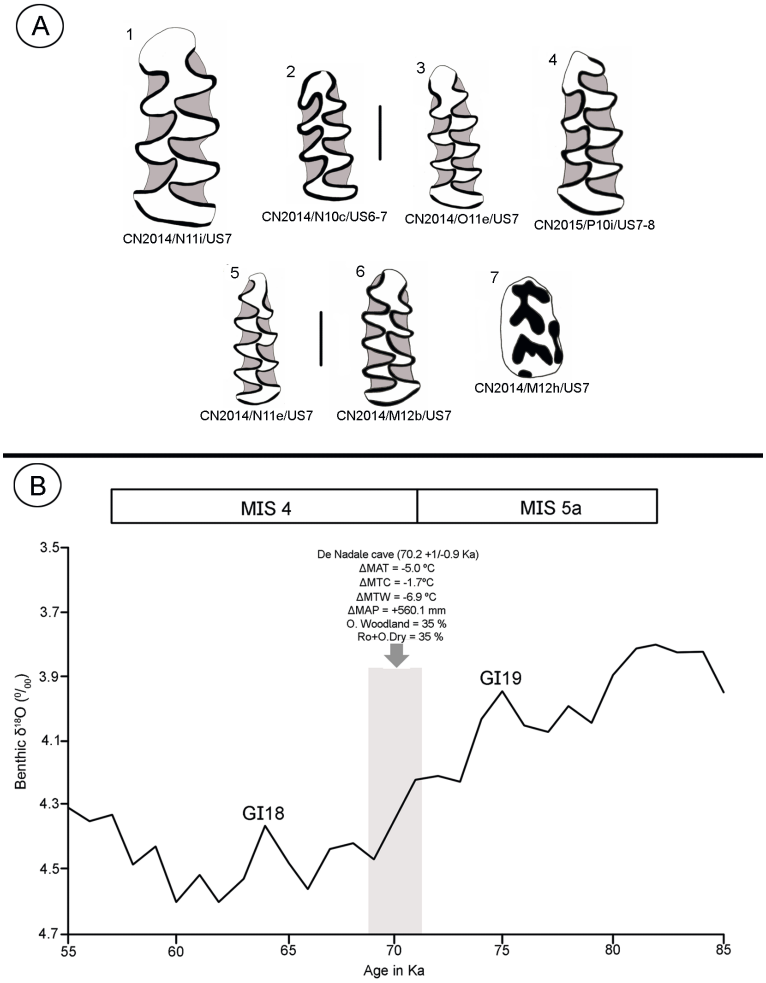

Fig. 1. A. Some small mammals identified from De Nadale cave Unit 7. 1. Arvicola amphibius left m1, occlusal view; 2. Clethrionomys glareolus left m1, occlusal view; 3. Microtus arvalis left m1, occlusal view; 4. Chionomys nivalis left m1, occlusal view; 5. Microtus agrestis right m1, occlusal view; 6. Microtus (Terricola) gr. multiplex-subterraneus right m1, occlusal view; 7. Apodemus cf. flavicollis right m1, occlusal view. All scales = 1mm. B. Position of the De Nadale cave Unit 7 (grey bar) in relation to the Benthic 18O curve. GI represents the Greenland Insterstadials. ΔMAT is the average of Mean Annual temperature; ΔMTC is the average of Mean Temperature of Coldest Month; ΔMTW is the average of Mean Temperature of Warmest Month; ΔMAP is the average of Mean Annual Precipitation in relation to the present means at Barbarano Vicentino meteorological station. O.Woodland is the percentage representation of the open woodland landscape in De Nadale cave Unit 7. Ro+O.Dry is the percentage representation of rocky and open dry habitats in the De Nadale cave Unit 7.

Sorex minutus and *Neomys* cf. *anomalus*); one bat (*Myotis* sp.) and 8 rodents (*Arvicola amphibius*, *Microtus arvalis*, *Microtus agrestis*, *Microtus* (*Terricola*) gr. *multiplex-subterraneus*, *Chionomys nivalis*, *Cletrhionomys glareolus*, *Apodemus sylvaticus* and Apodemus flavicollis). Coupled with the absolute dating together with previous studies on large mammals and the few pollen studies in terrestrial sequences for this time-span in Italy and the sea cores of Mediterranean basin, results enable us clearly to identify a cold climatic period with a landscape dominated by open woodland formations and open-dry habitats, probably related with the beginning of the Marine Isotope Stage 4 (MIS 4) (Fig. 1B).

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María Clara López Sosa

Endocranial Morphological Affinities of the Early Holocene Individuals from Lagoa Santa and Implications for the Settlement of the Americas

The settlement of the Americas is a topic that has been widely researched and discussed for more than 150 years. How and when the first human groups migrated to the continent are two of the most investigated questions that have been approached by a variety of fields. One of the most important geographic regions for these studies is Lagoa Santa, in Minas Gerais, Brazil. The vast number of archaeological and paleontological sites located there has allowed for the development of several studies, whose results have led to the different hypotheses regarding the peopling of the New World. Among them, the studies focusing in cranial morphology that gave the basis for the so called "Two Main Biological Components Model" stand out. That model, was postulated by Walter Neves and Héctor Pucciarelli after they performed the first multivariate analyses to approach the morphological variation of early South Americans. According to them, the specimens from Lagoa Santa, as well as other early Holocene individuals, show a different morphology than the extant Native Americans. That morphology, referred to as "Paleoamerican" predominates mainly in Australia and sub-Saharan Africa, and is characterized by long and narrow neurocrania, low and prognathic faces, and low and wide orbits and noses. The other morphology, referred to as "Amerindian", whose pattern is present in eastern Asia and in the Americas, is characterized by short and wide neurocrania, high and retracted faces, as well as narrow orbits and noses. The model suggests that both morphologies are the product of two successive migratory waves that took place ca. 15 kya and 10 kya, respectively. The present project aims contribute to the variety of studies, whose objective has been to test this model. To do so, the endocranial morphology of the individuals from Lagoa Santa was analyzed and compared to other populations using Geometric Morphometrics. The results obtained suggest that the Lagoa Santa specimens present a morphology that seems to share traits with other American populations, as well as with Africans and Australians, which suggests that they might have shared a common ancestral population with the other Americans.

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Hunting behavior of Late Neanderthals in the North-east of Italy. Results from zooarchaeological analysis of unit II assemblage of Grotta Maggiore di San Bernardino (Berici Hills, Vicenza)

Grotta Maggiore di San Bernardino is located in the Berici Hills, in northeastern Italy, at about 135 m above sea level. The cavity was subject of systematic excavations carried out by the University of Ferrara in 1959-1964 and between 1986-1993. Field investigations explored a stratigraphic series of about 4 m thickness, which includes 8 main units dating from MIS 7 to MIS 3.
The focus of this work is the zooarchaelogical analysis of Unit II (MIS3). It records an intense human occupation attested by hearths, temperate type associated faunal remains and Mousterian lithic implements.
Bone assemblage shows a prevalence of medium and large sized ungulates: the most frequent species are roe deer, red deer, wild boar, moose and giant deer, followed by bovids and caprids. Carnivores are less numerous, represented by different species and the cave bear is the most represented. Were recovered also rhinoceros and beaver remains. The presence of Castor fiber together with waterfowl (duck, geese) and fishes indicates the existence of humid environments and watercourses in the surroundings.
Bone taphonomy has identified high incidence of burned remains and of anthropic actions ascribable to different stages of the butchering process like skinning, dismembering and filleting. Several fragmentary bone shafts show typical stigmata due to their use as retouchers for flint tools.
As Faunal assemblages similar to Grotta San Bernardino unit II can be observed in the Mousterian levels of other sites of the Berici Hills (Grotta di Paina, Grotta del Col della Stria, Grotta de Nadale) and Lessini Mountains (Grotta di Fumane, Riparo Tagliente).
Grotta di San Bernardino represents a further case of Neanderthal behavior in terms of subsistence. Additional faunal analyses, will cast new light on the site and clarify its relationship with the territory, the organization of the site itself, the activities, the hunting areas and the chronology of the occupation.

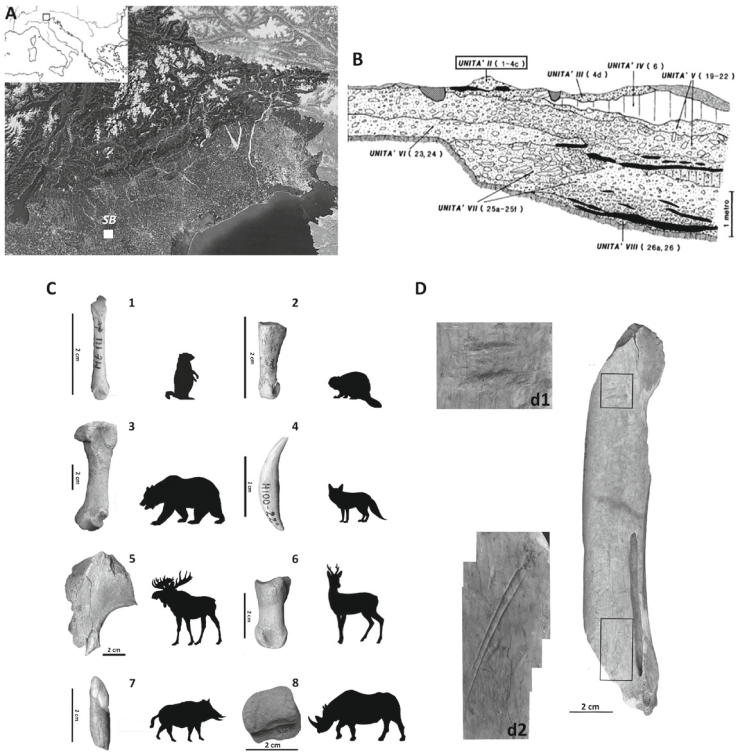

Fig. 1. A: the northern Adriatic region with the location of San Bernardino maggiore (SB); B: stratigraphic section; C: example of faunal remains: 1: Marmota marmonta: third metatarsal; 2: Castor fiber: first phalanx; 3: Ursus spelaeus: fourth metatarsal; 4: Vulpes vulpes: upper canine tooth; 5: Alces ales: ulna; 6: Capreolus capreolus: second phalanx; 7: Sus scrofa: lower incisor tooh; 8: Cfr. Rhinoceros: second phalanx; D: Cervus elaphus: radius/ulna with retouch stigmata (d1) and cut-marks (d2).

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Juan Marín[1,8], Palmira Saladié [2,3,4,5] & Antonio Rodríguez-Hidalgo[6,7,8]
Neanderthal subsistence strategies at Abric Romaní

Zoorchaeological works have been capital in the study of Neanderthals behaviour. Some features of subsistence strategies and social skills of hominins groups as, for example, consumption patterns, size of the hominin groups, hunting and transport strategies or settlement pattern, among others, could be inferred throughout the zooarcheology using aphonomical analyses, reconstruction of anatomical profiles, identification of age at death of animals and construction of mortality profiles. The capability of Neanderthals for hunt large ungulate has been largely proved in the European record. Many studies put the point in the specificity of sites in relation to the activities realized by human groups. Our work has the objective of identified the possible type of occupation and utility of Abric Romaní. This site is one of the Neanderthal sites best know of the European record, and has been worked from a multidisciplinary way. At the moment we show that the Neanderthal groups developed specific hunting strategies based on the taxa and the age of the animal to be hunted and variable transport strategies of animal carcasses independent of their weight size category. Throughout the study of mortality profiles we show that Neanderthals employed both selective and non-selective hunting strategies. The selective strategy focused on the hunting of prime adults and generated prime dominated profiles. On the other hand, non-selective strategies, involved the consumption of animals of variable ages, resulting in catastrophic profiles. As well as, throughout the reconstruction of anatomical profiles of large and medium size animals in relation with utility and diversity index we show that Neanderthals developed variable transport strategies of animal carcasses independent of their weight size category. The final assemblage of the site is the sum of multiple and diverse transport events, from the transport of some element to the transport of a complete animal. The main characteristic of transport is the high diversity of elements that can be transported after each hunting event. These results renew the information and give new data of some features of the groups that occupied the Abric Romaní. The groups that occupied the site developed successful subsistence strategies, adapted to the specific environment of the site, that were repeated throw a period of time of 35.000 years.

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Tracing the Neanderthal life history from the Pyrenean Sierras Marginales and Exteriores (SME) (Northeast of Iberia). II-Behavioral Middle Paleolithic trends during Early Upper Pleistocene (MIS6 - MIS3)

Last years, an increasing assemblage of Mousterian settlements has been located in the SME, providing key indicators to analyze Neanderthal presence in Iberian Peninsula. This geographic area is in the core of many polemic debates concerning Neanderthal resilience in the Upper Pleistocene, its extinction as well as its possible persistence beyond the limit 40 ka. Although these topics are integrated in the current paleoanthropological arena, paradoxically the implications of these sites has scarcely been involved in these discussions.
This eventuality encourages us to develop a transversal approach to evaluate the important archeological potential of the area. The vast temporal range represented by these sites -around 100,000 years-, the spatial, functional and taphonomic diversity of each, make it difficult to establish direct comparisons. Alternately, we explore if parameters such as site election, lithic assemblage configuration and intra-site patterns allow obtaining elements to illustrate behavior and evolutionary changes.
Mousterian sites of the Pyrenean SME are called to play a basic role in the characterization of the Neanderthal lifestyle of Western Europe during the Upper Pleistocene.

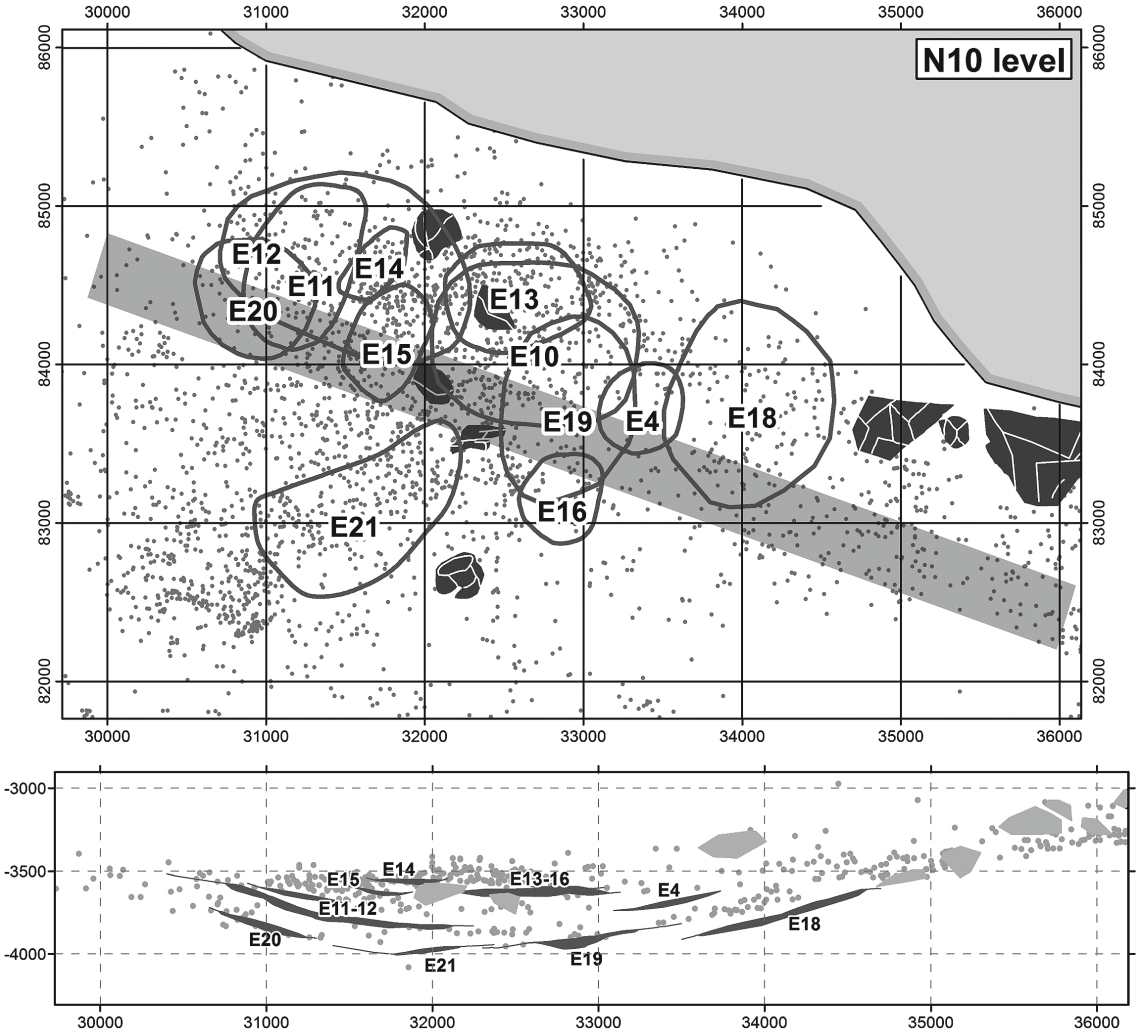

Fig. 1. Roca dels Bous: distribution and section of the hearths at the Mousterian N10 level.

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Peopling the Iberian System with Neanderthals: current state and new insights

The Iberian System is a medium altitude mountain range (Moncayo, with 2315 masl, is the highest point) reaching 500 km lenght in a northwest-southeast disposition (from Sierra de la Demanda to Puertos Tortosa-Beceite and the Sierra de Mira). This mountain chain separates the Inner Iberia and Ebro Depression and in which arid and cold conditions prevail within a Mediterranean climate. It is a massive and compartmentalized mountain range in which karstic phenomena are frequent while some river valleys go through it transversally (e.g. Jalón), forming obligatory crossing-paths for the transit of human, fauna and vegetation communities between Ebro Depression and Inner Iberia.

From Edouard and Louis Lartet's archaeological campaign in Peña Miel cave (in 1865) to those currently on going in P5 and P7 Aguilón caves, the catalogue of sites ascribable to the Mousterian exceeds the number of twenty, among stratigraphic sequences in caves (9) and open-air sites. These sites are distributed unequally between both sides of the mountain range (most of them in the Ebro Depression side, in this case with a "regularly" dispersion, and not concentrated or focused in an area or region, as it seems to happen in other zones, e.g. Cinca-Segre), although perhaps available data are selective. Among the sequences in caves, it is not strictly necessary to think about the existence of recurrent location criteria neither of a same function for those different human occupations. However, open-air sites are mostly associated with the appearance of very good quality flint outcrops which are distributed by mounds and foothills of the Ebro Depression side.

The available chronometric results set situates these tool assemblages between 137.9 ky in Cuesta de la Bajada, 135 ky in Las Callejuelas (La Tejería Ravine), 42.4 ky cal BP (AMS) in level c of Peña Miel or 41-43 cal BP in Cueva Millán (conventional radiocarbon method). In this work we provide a state of the art and new insights to Neanderthal peopling, behaviour and ecology in this territory.

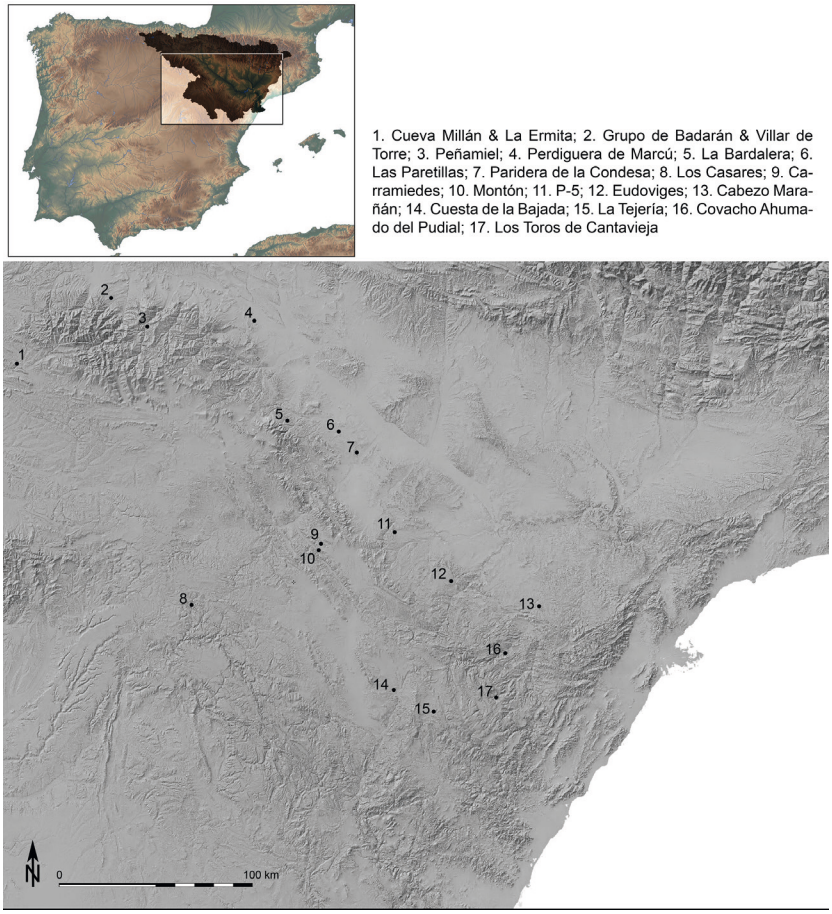

Fig. 1. Mousterian sites along the Iberian System (Spain).

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Lumila Menéndez [1,2]

A quantitative sex determination analysis based on cranial variation of South American populations

Sexual dimorphism represents the main source of variation among adults within human populations, and as such, one of the fundamental procedures when studying human bones. Despite most studies address sex determination by using qualitative techniques, morphology varies continuously, and as a result, some specimens whose sexual diagnostic features are difficult to assess, might remain as "indeterminate". Therefore, in the present study a quantitative method for sexual determination based on registering 3D landmarks in the skull is tested. A sample of ~300 individuals with no evidence of artificial cranial modifications coming from 10 late Holocene South American populations was used. A total of 23 anatomical points were collected employing a MicroScribe G2X digitizer. From the results of the PCA it can be observed that for each sample, the specimens are grouped into two separated clusters that reflect sexual dimorphism variation, i.e. a separation of males and females due to the morphological variation of each group. A similar pattern of variation in relation to the distribution of individuals was found within each sample. While females are grouped in the negative extreme of the first principal component, males are concentrated in the positive extreme of the first principal component, what may be the result of an allometric effect. Moreover, some populations present a stronger differentiation between males and females (San Blas, Valle Calchaquí, Valle de Andalgalá, Quebrada de Yacoraite) than others (Rio Negro, Chubut, San Juan). Concluding, the discriminating power of 3D geometric morphometrics techniques allows differentiating between males and females' variation, providing an alternative avenue that would help at assessing the sex of specimens that present ambiguous features.

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Diachronic study of human behaviour in lithic resource management: a research project from northern Hungary

Human behaviour towards natural resource management was a basic element of adaptation along prehistory. Our project studies this topic with the focus on lithic raw materials resources within a time frame, from the Middle Palaeolithic to the Middle Neolithic, with important climatic-environmental changes and important economic-cultural changes. The Northern Hungarian Range, belonging to the inner Western Carpathians, is dominantly built up from Mesozoic and Tertiary rocks of sedimentary and volcanic origins. Due to its complicated formation history, there are various geogical formations which contain different types of siliceous rocks. The southern foothill regions of the Northern Hungarian Range, especially the Mátralja and the Bükkalja areas, are rich in human occupation sites from the Stone Age. Taking into account palaeogeography, settlement strategy, access to raw material source, aptness of raw materials to knapping, and lithic economy, it will be possible to see a diachronic tendency with cultural and natural factors. Our research project use a complexe methodology. All occurences of siliceous rocks will be mapped in the regions by studying geological properties, using Fine-grained Pebble Examination (FPE) method and field surveys. They will be evaluated as raw material sources regarding exploitation possibilities and rock quality. Applying palaeogeographic reconstructions their palaeo-accessibility will be reconstructed for the study periods. Human settlements from the study periodes will

be mapped in the study areas using archaeological data and field surveys. The exploited raw material spectrum in an archaeological assemblage will be identified. Based on technological analyses the modes of acquisition and processing of each raw material will be recognized. Due to the application of GIS based data processing on geological, geomorphological and archaeological data sets, the modelling of the dynamics of the lithic economy will be undertaken for the study time frame. The role played by the changes in the environmental and the cultural factors will be evaluated.
The project is financed from the NRDI Fund (K 124334).

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Pinilla del Valle sites: new preliminary data to understand Neanderthal-carnivore interaction in the Iberian Plateau

The Calvero de la Higuera (Pinilla del Valle, Madrid, Spain) is a unique archaeopaleontological complex to understand the relationship between Neanderthals and hyaenids during the Late Pleistocene (from the beginning of MIS 5 to late MIS 4). Pinilla del Valle archaeological sites are situated near the Lozoya River where five sites with different taphonomic interpretations have been found. The archaeological record recovered in Buena Pinta, Ocelado and Camino caves shows evidences of an intense carnivore activity, while Des-Cubierta cave and Navalmaíllo rock shelter show actions or activities of an anthropic origin.
This paper presents the zooarchaeological and taphonomic study of faunal remains in the level F of the Navalmaíllo rock shelter (Pinilla del Valle, Madrid), dating at the end of MIS 5 (ca. 75.000 BP). This site is probably one of the largest Middle Paleolithic site in the Iberian Plateau (ca. 300m^2). The detailed study of faunal remains has shown that level F of Navalmaíllo rock shelter was an intense occupation in which Neanderthals developed their daily activities processing animal carcasses and breaking bones to access the marrow. The consumption of medium, large and very large sized animals has been identified, with bovinae consumption being particularly significant. The occupation is clearly anthropogenic, meanwhile carnivores also had intermittent access to the rock shelter.

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Tracing the Neanderthal life history from the Pyrenean Sierras Marginales and Exteriores (SME) (Northeast of Iberia). I-Landscapes and settlement patterns during Early Upper Pleistocene (MIS 6-MIS 3)

The Sierras Marginales y Exteriores (SME) of the Pre-Pyrenees are located between the flat lands of the Ebro Basin and the high peaks of the Pyrenees. Its central-eastern area corresponds to the Cinca-Segre interfluve, where important limestone cliffs are common. It is a low/mid-mountain landscape with Mediterranean climatic influences. This geological environment promotes the formation of caves and rock-shelters, preserving a relevant accumulation of Middle Paleolithic sites.
Biogeographically, it defines an ecotone with rapid access to biotic resources, both from the mountains and the plains. Different raw materials with varied qualities are gathered from local and regional outcrops. The river network favored displacements generally in direction S-N (and vice versa), but internal corridors equally favored the displacements across the territory, a pattern well-known in recent Prehistoric times but firstly documented in the Middle Paleolithic.
In this presentation we will evaluate the factors that can explain this relative concentration of settlements, that could be placed in the Mousterian sphere (perhaps even earlier), covering a wide chronological span comprising from the end of MIS6 to the MIS3.

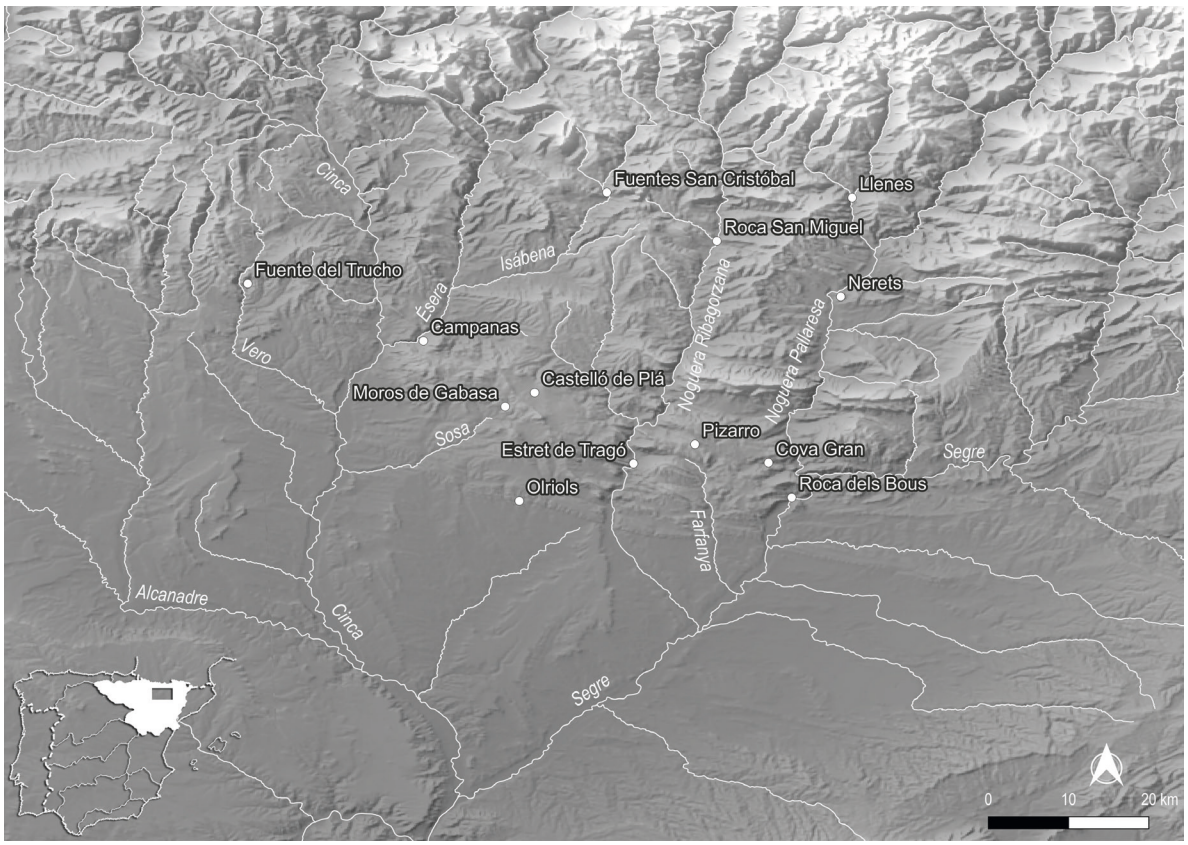

Fig. 1. Map showing the Mousterian sites in the Pyrenean SME.

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Late Middle and Early Upper Paleolithic occupation of the Mediterranean Penedès (Catalonia, Spain). First notes about newest excavations

During the 2014-2017 period, a new research project - "Late Upper Pleistocene Human Substitutions & Economic Transitions"- was developed in the central and southern regions of Catalonia. The main goal was the identification and excavation of coastal human occupations covering the time span between MIS-5 and MIS-3 to build up a multi-site sequence composed of long-term human behavioral and economic adaptations. The regional record of late Neanderthals is mainly documented through the large and continuous sequence of the inland close site of Abric Romaní (Capellades), and the hominin site of Cova del Gegant (Sitges). However, almost nothing is known about the economic patterns of the Neanderthal occupations of littoral environments, or, about the chronology and circumstances of the Neanderthal substitution by Modern Humans.
Within the first four years of the project our work has specially targeted the prospection of the southern spurs of the Catalan Littoral Range, where the excavation of some previously known sites has been relaunched and new other ones started. The most remarkable results are summarized in this paper, compiling the latest data from three new sites yielding MIS-5 to MIS-3 human occupations. All the results confirm an intense and long-term pattern of human presence in a territory previously poorly known, outstanding the long Middle Paleolithic sequence documented at La Griera site (Calafell), and the sporadic short-term MIS-4 / MIS-3 human frequentation of Cova Foradada (Calafell) and Cova del Trader (Cubelles).
The excavation at La Griera uncovered, for now, an almost 3m thick sequence with Magdalenian and Aurignacian occupations at the upper layers and, at least, three major stratigraphic units with Neanderthal occupations separated from the former by a stratigraphic hiatus. The preliminary reports on the lower layers suggests a pattern of diachronic technological evolution from discoid-dominated technologies with denticulate and scrapers at Unit III to a much more Levallois and point-dominated occupations at Units V and VI. Equids seems to be the predominant taxon during the Middle Paleolithic, contrasting to the more abundant presence of *Cervidae* at the upper units.
Cova del Trader and Cova Foradada provided an interesting record of very short-term, probably hunting related, human frequentations. Cova del Trader was excavated for the first time in 2016 and work has just begun, but Middle Paleolithic units have been confirmed. However, the most intense work developed at Cova Foradada has allowed for the documentation of three isolated events of human activity in a carnivore dominated background. Radiocarbon dates and techno-typology place these short events at *ca* 30 ka cal BP for Layer IIIn, *ca* 38 ka cal BP for Layer III, and pre-38 ka cal BP for Layer IV, therefore filling the chronological gap documented at La Griera sequence. Despite the paucity of data characterizing the technological assemblages, the presence of Dufour bladelets and split-based antler points at Layer III and large pointed and backed Châtelperronian-like points at Layer IV confirms Cova Foradada as one the southernmost European evidence for a Middle-to-Upper Paleolithic sequence, including the presence of the last Neanderthal technological adaptations.
As a concluding remark, the first years of the development of this project let us to document a continuous sequence probably beginning with *ca* MIS-5 Middle Paleolithic occupations at La Griera and lasting until Early Gravettian at Cova Foradada's Layer IIIn. The evolution of the ongoing multi-method dating techniques and the progressive advance in the study of the technological and zooarchaeological assemblages will contribute to provide a long-term evolutionary record for the human occupations of the Mediterranean littoral areas of the NE of the Iberian Peninsula.

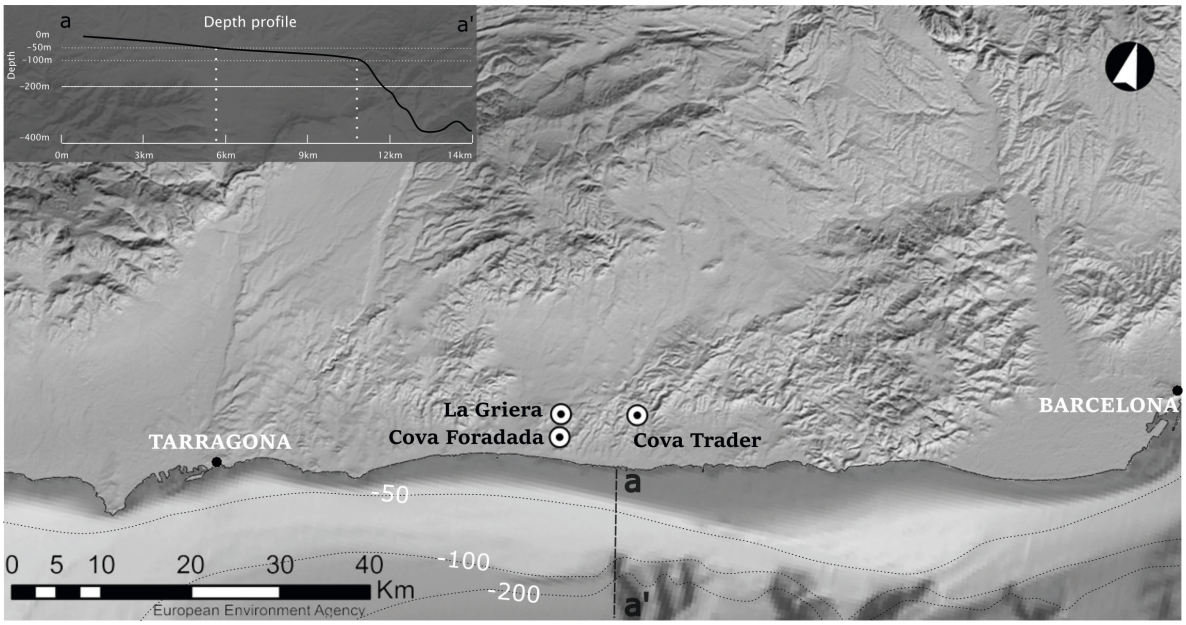

Fig. 1. Location of the sites La Griera, Cova Foradada, and Cova Trader and depth profile of the adjacent coastal area.

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Universe Inside Dolní Věstonice Venus

The Dolní Věstonice Venus is undoubtedly an enigmatic object from Palaeolithic times. Since its discovery, scholars have attempted to describe the material from which the Venus is made. Some analyses undertaken by Karel Absolon before WWII were destructive and had limited possibilities to determine the material from the body as a whole.
Using new technologies, we now have an opportunity to look inside the body with astounding resolution. The newest scanning of the Venus was realized in 2016 in collaboration with FEI Czech Republic, today part of the ThermoFischer Scientific company that is focused on developing high-resolution microscopes and CT scanners. Due to limitations of the scanner, the body of the Venus was scanned in two steps with a resolution of several micrometres. Digital models of both the upper and lower parts of the statuette were then merged together.

The research is focused on following questions:

1. What is the composition of the body?
2. Was the Venus made from one or several clods?
3. Was the loess clod(s) intentionally modified by different particles that are inside the body?
4. Where is the material from?
5. Are we able to recognise the raw material of particles using only digital pictures?
6. What is the inner condition of the statuette?

Preliminary results show the Venus was made from one loess clod that contained different admixtures – carbonates, bones and/or ivory, charcoals, quartz grains (materials we knew or expected) and additionally Tertiary fossils. It seems the creator of the Venus used common material from the living surface of the site and prepared the ceramic without special treatment. Of course, we cannot yet exclude the possibility that he/she internationally added ivory or mammoth bones inside the body; nevertheless, such an act is unlikely.
Additionally the digital model permitted, for the first time, the characterisation of small indentations and impressions on the surface of the Venus. The shape of four holes on the top of the head is the same indicating the holes were made by the same tool, probably the quill of a small feather.
Unfortunately, we observed cracks inside the Venus body that are much more dangerous than previously realised. The interconnectivity of the pieces will be tested further, and the results used to decide how best to transport the Venus in future, particularly when travelling by aeroplane.

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Martin Oliva
Specificities of the Moravian Mesolithic

The relatively restricted number of Mesolithic sites in Moravia is counterbalanced with their considerable extent and concentration in the lowlands along southern Moravian rivers. The densest concentration occurs on some 2 kilometers long section of the Jihlava River in the area of Smolín and Přibice, another one is on the Dyje River under the Pavlov Hills. In Smolín, floor plans of slightly sunk habitations were discovered. These largest agglomerations belong to the Early Mesolithic, dated to the Boreal and characterised by a prevalence of microlithic points and triangles. Trapezoid blades prevail in Mikulčice on the Morava River and in the surroundings of Příbor in northern Moravia. They may represent a later phase of the Mesolithic, belonging to the Atlantic, but they have not been dated yet. The large settlements in southern Moravia, and also extensive quarrying of Jurassic silexite in Krumlovský les, witness about a high degree of sedentarity. The mentioned Jurassic silexite is also the only raw material that spread – despite its poor quality – hundreds of kilometres beyond the borders of the country. Raw materials of local origin prevail in all the Moravian Mesolithic groups, mostly originating from Krumlovský les or from river gravels. Imports were coming to southern Moravian lowlands mainly from the south-east, i.e. from the original Neolithisation areas (radiolarite of the Szentgál type, obsidian). All these phenomena, differing from the situation in Bohemia, set the territory of Moravia to the Peri-Neolithic sphere.

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Taylor Otto & Gerd-Christian Weniger

Land Use in the Middle Palaeolithic of the Eastern Rif – Sites, Settlement Pattern and Mobility

Over 20 years of constant fieldwork in the Eastern Rif, Northeast Morocco, have yielded imposing amounts of archaeological materials and data from over 300 sites from all phases of prehistory. Detailed surveys and excavations by the German Archaeological Institute (DAI), the Institut National des Sciences de l'Archéologie et du Patrimoine (INSAP) and the CRC 806 – Our Way to Europe have especially led to the discovery of a large number of Middle Palaeolithic sites. This techno-complex is already known from North Africa for its especially rich archaeological record, and therefore serves as an ideal test case to work out connections between sites and their environment and reconstruct land use and mobility patterns in hunter-gatherer prehistory. This contribution presents sites discovered during the countless survey campaigns in the Eastern Rif, and contextualizes them in the archaeological landscape. We use point pattern statistics and site catchment analysis to characterize settlement pattern, procurement systems and mobility. Doing this, we not only present the new sites from the Middle Palaeolithic, but also a comprehensive, multi-proxy method for regional land use analysis.

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Jels 3 – a new Hamburgian locale near the Jels lakes

The Hamburgian culture is a Palearctic reindeer-specialised forager culture, linked to the earliest human occupation of northern-central Europe including southern Scandinavia after the end of the ice age. Proof of Hamburgian presence in Denmark was for the first time definitively established by the discovery and subsequent excavation of the two locales at the Jels lakes in southern Denmark, Jels 1 and 2, between 1981 and 1984. In the following years, the occasional remains have been found in several other places in the country providing unique insights into the nature of these earliest pioneers of north-west Europe. Yet, only very few sites of Hamburgian origin are known from the south Scandinavian area, making each new locale a significant contribution of the available evidence, and in-depth studies of this pioneer colonisation period remain rare. In the period between March 2009 and June 2010, a third Late Palaeolithic site yielding material of the late Hamburgian 'Havelte phase' (14,500-14,000 cal BP) was excavated at the Jels lakes in southern Denmark. After having languished unstudied in storage for some time, this poster introduces this new site as well as presents a first analysis of the lithic inventory. A technological attribute analysis of the assemblage has been conducted, comparing Jels 3 with the nearby assemblages from Jels 1 and 2. There are significant similarities in knapping behaviour and assemblage composition. Finally, several projectile point fragments have been uncovered which are almost identical with projectile points from both the other Jels sites and sites in eastern Denmark.

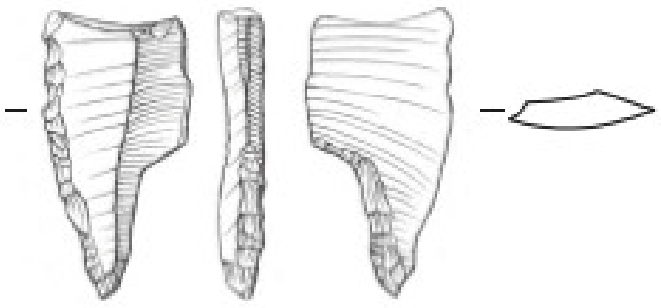

Fig. 1. Figure shows one of three Havelte-type projectile-fragments from the Jels 3 site (drawing: Louise Hilmar).

This close similarity may be interpretable as a very close and direct chronological and cultural relationship between the south Scandinavian Hamburgian sites. Therefore, the Jels 3 site serves as a point of departure for a much more thorough and in-depth interrogation of the south Scandinavian material as part of a doctoral research project at Aarhus University. This project will seek to employ a mixed-method approach to identify the artefactual signatures of individuals in order to quantify and thereby qualify the technological and morphological variability characteristic of the Hamburgian. This may yield refreshing new insights into the internal chronology of the Hamburgian and the pattern and process of this earliest colonisation event.

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Sebastian J. Pfeifer[1], Frank. A. Müller & Wolfram L. Hartramph[2]
The elephant in the room. A materials scientific approach to explain the role of Proboscidean ivory for Late Glacial societies

The widespread use of mammoth and mastodon ivory for a great variety of heavy-duty tools like scrapers, hoes, adzes and especially big game projectile points is clearly documented in the archaeological record from Europe, Siberia and North America. The reasons why Late Glacial societies applied that raw material, however, are certainly manifold and hitherto poorly understood: Neither is it easily accessed nor worked, and other suitable osseous raw materials like reindeer antler were virtually always of abundant supply.
We chose to address the question by testing the mechanical properties (Young's modulus of elasticity & bending strength) of both perma-frozen mammoth and recent elephant ivory under standardized conditions on a representative sample, following the experimental protocols developed for other hard animal tissues. The preliminary results suggest that Proboscidean ivory is a superior biological raw material not only for art and adornment but also for highly strained implements.

Fig. 1. Ivory projectile points from the Upper Paleolithic Pekárna cave site, Czech Republic.

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Katarzyna Pyżewicz[1] & Zdeňka Nerudová[2]

Brno-Štýřice III Paleolithic site – a microwear approach to the recognition function of the lithic tools

From the Epigravettian site (LUP) Brno-Štýřice III (Nerudová, 2016) have been analysed lithic pieces, classified as tools as well as pieces with macroscopic traces of marginal – discontinuous – retouch. A total of 187 artefacts have been microscopically analysed by K. Pyżewicz. As a result of the studies we noticed the different types of use-wear traces on the 57 of them.
Many of artefacts are covered with the shiny patina, which is the worst postpositional factor influencing the quality of the use-wear analysis. These ones which are covered with whitish patina are better to analyse. But on the surfaces of some lithics we can recognize using traces. These traces are associated mainly with animal carcass treatment (tools were usually used for cutting or scraping). There are some traces which are the result of hide processing, butchering activities or bone/antler processing. Use-wear traces which have been recognized are located mainly along unretouched edges. We also noticed some traces associated with plant (10 pieces) or wood (1 piece) processing. Recognized use-wear traces are located mainly along unretouched edges or around the negatives of burin spalls. From the technological point of view are very important also technological observations on the artefacts: in many cases are visible the traces of using the stone (mineral) hammer for retouching and knapping.
The spatial distribution of the artefacts with the use-wear traces correspond with the settlement density. Characters and intensity of the use-wear traces fit well not only with the faunal remains (Roblíčková et al., 2015) at the site but also with the palynological and anthracological analyses (Nerudová et al., 2016). These results can be comparable with the other LUP sites, for example in Poland (Pyzewicz, 2015).

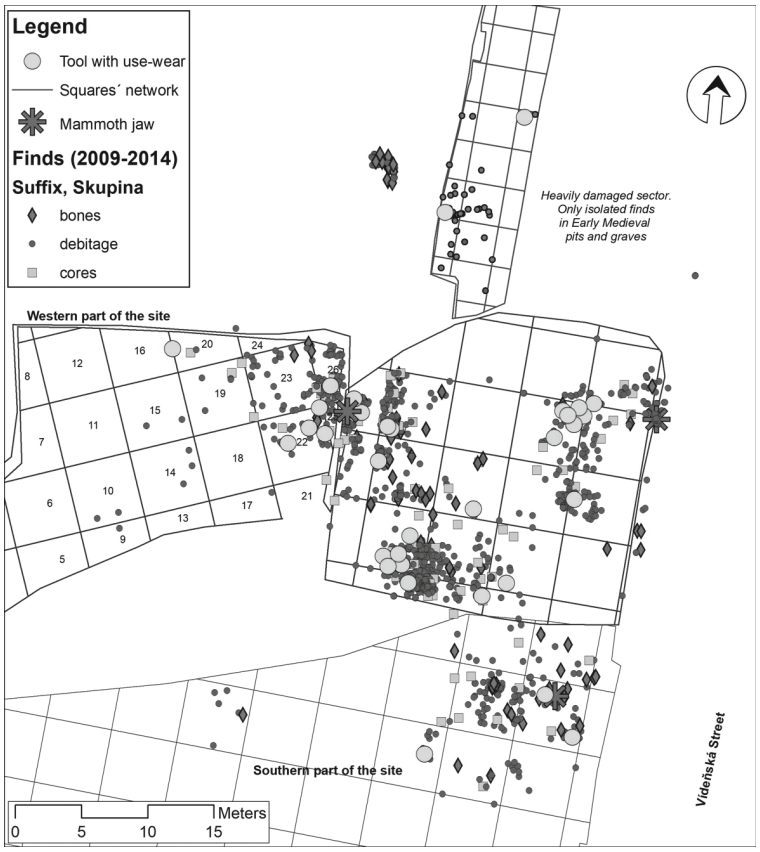

Fig. 1. Spatial distribution of finds from Brno-Štýřice III.

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Paleoenvironmental context of the human occupations in Crimea during the MIS 3: an approach using tooth microwear patterns in ungulates

The paleoenvironmental context of the Late Pleistocene human occupations in Crimea was studied in three sites: Kabazi II (ca. 40 to 30 ka BP), Siuren I (around 28 to 29 ka BP), and Chokurcha (44 to 39 ka BP). We used tooth microwear analysis to infer the diet of ungulates at the time of death. This proxy provides evidences about (1) the habitat where the ungulates were hunted but also can inform about (2) the duration of the events of occupation in each archaeological level.
The European ass (*Equus hydruntinus*) present at Kabazi II and Chokurcha show a similar microwear pattern to that of the horse (*Equus ferus*) from Siuren I. The two species have a pattern characterized with high numbers of scratches related to a highly abrasive diet based on grasses (which are rich in phytoliths). The saiga (*Saiga tatarica*) is found at Siuren I and Chokurcha. It shows a microwear with high numbers of scratches which, as for the equids, are indicating grazing. It also has high numbers of pits suggesting the ingestion of dust or grit in a dry habitat, or feeding close to the ground on short grasses. Finally, the giant deer (*Megaloceros giganteus*), which is found in small numbers only at Siuren I, shows a low number of scratches, characteristic of browsers feeding on ligneous plants (leaves from bushes and trees or forbs). Considering the composition of the fauna, dominated by equids and saiga at all sites, the results indicate an open habitat where grasses are predominant.
The duration of the events of occupation can be estimated using the variability of the microwear signal. By means of a Bayesian model established of modern ungulates, it is possible to distinguish seasonal events vs. long-term occupations in archaeological assemblages. The results will be discussed at each site once the data are statistically processed. These will inform about the seasonality of the occupations in each archaeological level.

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Middle Palaeolithic Occupations at Cueva Ardales and Sima de Las Palomas de Teba, Málaga

Middle Palaeolithic occupations are documented in various caves and rock shelters in Southern Spain such as Carigüela (Fernández et al., 2007), Bajondillo (Cortés Sánchez et al., 2008) or Complejo del Humo (Ramos et al., 2005; Jennings, 2006). In 2011 a Spanish-German team started for the first time ever excavation in Cueva Ardales. The caves history reaches back to the middle of the 19th century (Ramos et al., 2014). Ardales is actually known for its outstanding inventory of rock art in Southern Iberia comprising engravings and paintings mainly from the Upper Palaeolithic (Breuil, 1921; Cantalejo et al., 2006). The chronology of the cave reaches from the Chalcolithic to the Middle Palaeolithic. During the still ongoing excavations in the entrance area which is filled by a steep sediment cone, traces of Middle Palaeolithic occupations could be identified in two zones. In front of the cave, about 150 m downslope a surface site "La Cucara" is known since several years. Its Middle Palaeolithic inventory gives evidence to an open air site near the cave.

In parallel our research team started excavations at the newly discovered site Sima de las Palomas de Teba, 15 km North of Cueva Ardales (Weniger & Ramos Muñoz, 2014; Kehl et al., 2016). The site is part of the north-eastern limestone rim of a small doline. The doline forms a nexus to the karst complex of the Cueva de Las Palomas, which extends downslope towards the gorge of Tajo del Molino. The Sima contains an at least 7 m-thick stratigraphic sequence. Its chronology reaches from Recent Prehistory to at least 55 kyrs BP with especially intense Middle Palaeolithic occupations at the bottom of the stratigraphy. Thus, questions about the transition from the Middle to the Upper Palaeolithic, the survival of Neanderthals in the southern part of Iberia as well as settlement dynamics in the late Middle Palaeolithic can be addressed.

In close vicinity to each other three Middle Palaeolithic occupations are under research that probably display different patterns of activity of Neanderthals in the area.

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An analysis of chaînes opératoires in Schöningen as a case study to be compared with other Paleolithic sites

The locality of Schöningen (Lower Saxony, Germany) is a unique archaeological complex of open air sites not only for understanding how hominins lived and interact with the environment ca. 300,000 year ago (MIS9), but also a case study for better understanding some exploitation activities that took place during the Paleolithic. Due to the great level of preservation the archaeological findings include: bone, wood and lithic artifacts. The exploitation patterns that have been identified, the raw material selection and the examples of tool manufacture indicate standardized chaînes opératoires in the manipulation of all the three categories of raw materials.

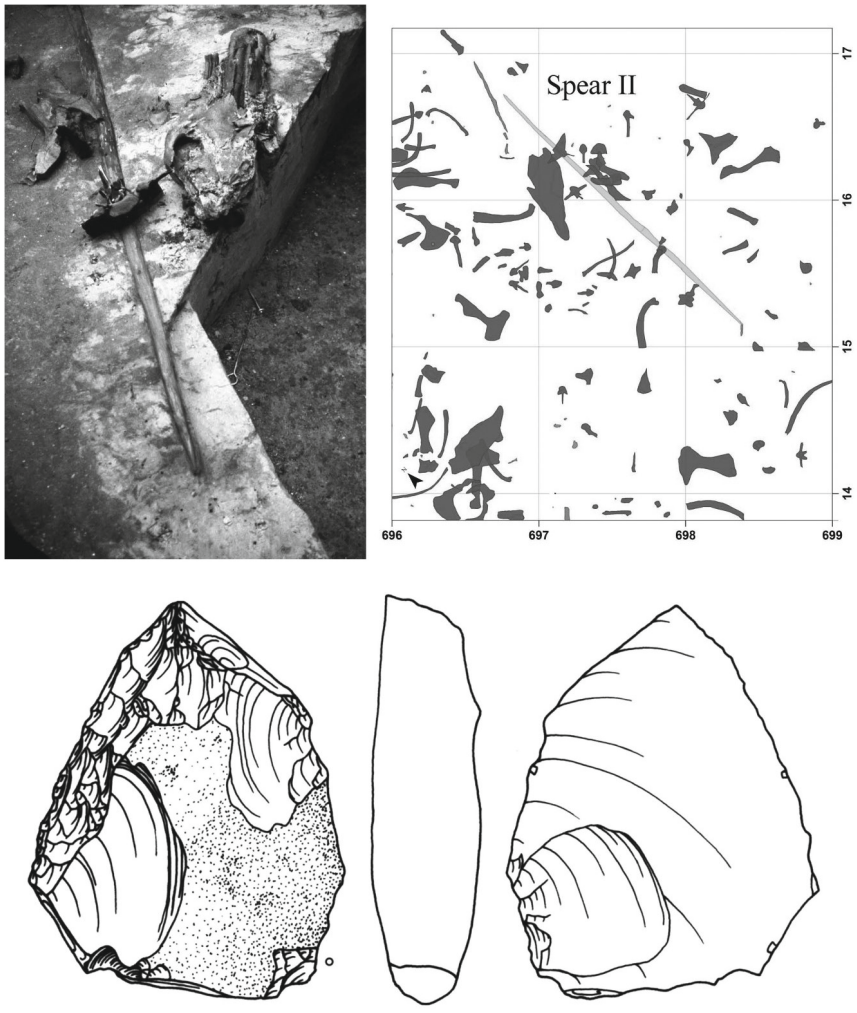

Fig. 1. Schöningen: find situation of a spear, distribution map, and lithic artefact.

The faunal finds bear cut marks and impact fractures, as the result from skinning and disarticulation. In addition, some faunal remains have also been used for complex activities that we are trying to better understand, but that, unfortunately, we still do not comprehend completely. The use of wood as raw material was surely not a peculiarity of Schöningen, but it is through the presence of a kit of wooden weapons (spears, lances and throwing sticks) and a digging stick, the Paleolithic site with the best preservation of such artifacts worldwide. The presence of a wooden digging stick as well as numerous animal bones with anthropogenic marks and rounded ends, indicate that human groups from Schöningen were not only hunting or butchering animals, but also performing a wide range of activities, as e.g. digging on the lake shore probably to collect roots. The stone artifacts assemblages despite the lack of bifacial, Levallois technique or standardized blanks indicate nevertheless a repeated pattern when exploiting the resources.
When comparing the different chaînes opératoires in Schöningen it is possible to state that the choice of a good, probably the best possible, raw material was decisive. At the moment we are looking if similar traces of raw materials exploitation can be found in other sites as Atapuerca, Bolomor cave (both Spain) and Qesem cave (Israel).

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Inside the secrets of Teixoneres Cave (Moià, Barcelona, Spain): An example of a multidisciplinary approach applied to a Neanderthal site

The use of techniques and methods from diverse disciplines is proving a salutary lesson for studies related to Neanderthal lifestyles. The multidisciplinary works point towards a high capacity to adapt to different climates and ecological environments, which suggests a significant behavioral plasticity of this human species. In this work, we aim to contribute to this topic from the Mousterian site of Teixoneres Cave (Moià, Barcelona, Spain). The geochronological, paleoecological and archaeological studies suggest a changing environment throughout MIS 3, with a combination (or alternation) between animals of temperate and cold environments (Rosell et al., 2017; Álvarez-Lao et al., 2017; Luzi et al., 2017). Human occupations seemed to lose territorial (and temporal) stability progressively as the period advanced. While unit IIIb, dated to ~ 50 ka, shows an important persistence of groups settled in the territory, the upper units (e.g., IIIa, IIb, IIa; ≤40 ka; Talamo et al., 2016) seem to be characterised by short-term settlements and their alternation with carnivore dens, mainly for hyenas and cave bears (Sánchez-Hernández et al., 2014; Rufà et al., 2014, 2016; Bustos et al., 2017; Rosell et al., 2017). The recent discovery of human remains opens the door to other disciplines, such as Paleoanthropology and genetics, at the site. Thus, Teixoneres Cave represents a key site to understand the Neanderthals' fate as a human lineage in the Northeast of the Iberian Peninsula, as well as the evolution of their subsistence strategies starting from the Middle Pleistocene until their disappearance in MIS 3-2.

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The role of small prey in Neanderthal contexts: the case of Teixoneres Cave (MIS 3, Barcelona, Spain)

The exploitation of small prey through prehistory has been an intensely discussed topic over the past few decades. Although some cases of the systematic procurement of small prey were documented during the Middle Pleistocene, it was not until the Late Upper Pleistocene that the human diet saw this important change. Notwithstanding, small animal bones, such as those of leporids and birds, are commonly found at many archaeological sites, and they could include evidence of both Neanderthal and other small predator activities. These alternated hominid-carnivore occupational dynamics make difficult to discern and/or isolate archaeological events within archaeological units. This is the case at Teixoneres Cave (Barcelona, Spain), where human occupations are combined with those conducted by carnivores. In this line, the main goal of the present work is to unveil the main accumulator agents, as well as possible secondary agents, involved in this Middle Paleolithic site. To achieve this objective, the bone remains of small prey (leporids and birds) from unit III (>51,000 to 40,610 ^{14}C BP) were analyzed using a zooarchaeological perspective and applying the principles of analysis from taphonomy. The results of our study show that small prey inputs have been generated by a mix of contributions in the site, in which small mammal carnivores and nocturnal raptors seem to play an important role –while leporids were occasionally introduced into the human diet, birds do not seem to be of interest to them. As shown in previous studies (Rufà et al., 2014, 2016; Rosell et al., 2017), diversified procurement strategies are found at Teixoneres Cave, where humans focus their activities on large fauna in the site and, occasionally, on leporid specimens. Additionally, the high incidence of small prey predators reinforces the general position that hominins made use of the cave during short-term occupations. The present research adds to our knowledge of human subsistence strategies carried out in this specific scenario and, thus, to better comprehend human dynamics of occupation in archaeological sites, and how they have significantly influenced the faunal record.

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Mediterranean vs. Atlantic: Ecological niches of ungulate preys in the Iberian Peninsula during the Middle Paleolithic

The strong climatic oscillations that took place during the European Middle Paleolithic modified constantly the paleoecological context of Neanderthal occupations. The general tendency is to assume that Neanderthal adapted their hunting strategies according to the behavior of the preys. In the Iberian Peninsula however, considering its particular latitudinal position, these factors were less intense, referring the region as a faunal and flora refuge. The objective is to test how the environmental shifts influenced the ungulate behavioral patterns in that region and their consequences on hunting strategies. We carry out a diachronic study of dietary patterns of *Cervus elaphus* and *Equus ferus* in different archaeological sites form the Atlantic and Mediterranean areas.
We propose to use dental wear methods (meso- and microwear), two non-destructive techniques that reflect the immediate feeding behavior of the ungulates as well as their habitat. They were proved sensitive to dietary and seasonal changes but them also to show strong latitudinal influences (Rivals et al., 2010). Tooth mesowear focuses on the accumulative abrasion-attrition effects of feeding processes at a macroscopic level. It is effective showing the feeding changes on a long timescale (months-years). On the other hand, tooth microwear analyses the microscopic features produced on the teeth surface by the abrasive particles present in the vegetation (phytoliths). It is sensitive to short term fluctuations (days-weeks), so it the last meals of an individual and consequently its ecological niche at the time of death.
In the two regions, *C. elaphus* show general dietary traits typical of leaf dominated mixed feeders, while *E. ferus* present a diet specific of pure grazers. The microwear pattern is homogenous through time, and suggest that these taxa persisted in their dietary traits despite the different environmental contexts. Therefore they occupied the same ecological niche both in the Atlantic and the Mediterranean areas. Thus, environmental conditions did not strongly influence the ecological niche of the ungulates hunted by Neanderthals.

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Preliminary results on the search for new Late Glacial rock shelter-sites in the Federal State of Hesse

The multidisciplinary project "Apocalypse Then? The Laacher See volcanic eruption, Deep Environmental History and Europe's Geo-cultural Heritage" at Aarhus University aims to investigate the influence of the catastrophic Late Glacial volcanic eruption on the lifeways of foragers 13.000 years ago. One of the major work packages is the discovery of new sites

which can provide Late Palaeolithic strata in the context of volcanic ash deposits. Previous tephrochronological research has demonstrated that neither open-air nor deep cave sites harbour great potential for discovering in situ volcanic ash (e.g., Housley & Gamble. 2015). In contrast, rock shelters are geomorphological features particularly well suited for preserving tephra deposits and they have been attractive for settlement throughout most of human prehistory. For the Late Palaeolithic, this can be observed with the sites of Bettenroder Berg in Lower Saxony which provide rich ABP (Arch-backed point-technocomplex) finds covered by Laacher-See Tephra (see Grote 1994). For the state of Hesse in Central Germany a database of ca. 800 potential rock shelters is forming the basis for the search for new sites in the medial zone of the Laacher See eruption (Hofbauer 1991, 1995). Geospatial approaches, including archaeological predictive modelling and the use of geological proxies, were used to estimate conditions most adequate for the potential presence of rock shelters used by Late Glacial foragers. Following this computer-aided pre-processing, a survey was conducted in the study area to ground-truth the model. Also, digital site-data was collected by aerial and ground-based photogrammetry to allow better planning of trial trenches. This exercise has yielded a small set of rock shelter locations, which holds great potential for the discovery of the sought-after Palaeolithic and volcanic layers.
In this presentation, we present the current state of our research in the study area. The Federal State of Hesse has not been the focus of much Palaeolithic research, especially when it comes to the Late Palaeolithic. We present, as a first example of our investigation, the site of the Wetterstein in north-eastern Hesse, which we argue shares many key landscape characteristics of Late Palaeolithic sites. The Hessian data holds the rare opportunity to conduct predictive research in a Palaeolithic context and test the computer models by excavations.

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Understanding standardisation of asymmetric tools from the Late Middle Palaeolithic: use-wear analysis to test morpho-functional interpretations

Behavioural concepts such as social transmission, cultural variation and the formation of traditions are essential for understanding the evolutionary process of becoming human. Although these concepts are most often difficult to recognise in Pleistocene archaeology, they gain visibility in the Late Middle Palaeolithic.
In the archaeological record stone tools provide the most crucial source of information as a mirror for the evolution of human technological and ecological adaptations. In the Middle Palaeolithic record, certain types of lithic artefacts, such as bifacial backed knives ('*Keilmesser*') represent a unique archive for tracing early hominin behaviour. This highly standardized, asymmetric tool form, belonging to the so-called '*Keilmessergruppe*' (KMG),

is characterized by a single cutting edge and is known from different sites in Central and Eastern European Middle Palaeolithic dating to the late OIS 5 until mid OIS 3.
In order to interpret the meaning of this technological facies in the variability of the Central and Eastern Europe Middle Palaeolithic industries, one of the most important questions concerns their usage. '*Keilmesser*' are, at a macroscopic level, morpho-technologically well-understood, providing morpho-functional interpretations of their usage (cutting, scraping, carving). In order to get a better understanding of why technocomplexes such as the KMG with regional tool making traditions appear within the Late Neanderthal cultural evolution and what they represent in terms of human technological behaviour, it is indispensable to combine techno-typological data and high-resolution use-wear analysis.
The PhD project presented here, aims to address this topic by applying objective and quantitative use-wear analysis on selected KMG lithic assemblages. The research workflow includes controlled experiments, analysis of material properties of the different raw materials, 3D morphometric data analysis as well as macro and micro use-wear analysis. The proposed approach also aims to provide an opening for a holistic, hitherto unachieved view of Late Middle Palaeolithic tool production concepts and use.

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Ulrich Simon

Gravettian ivory beads at Krems-Wachtberg (Austria)

Long-term excavations at the open-air site Krems-Wachtberg exposed a well-developed living floor with connected features like a multi-phased hearth and two infant burials (Einwögerer 2017; Händel et al. 2009; Simon et al. 2013). Within the older Gravettian of Central Europe Krems-Wachtberg can be assigned to the Pavlovian. This attribution is based on a number of analogies with contemporaneous sites like Dolní Věstonice, Předmostí and the eponymous Pavlov.
The rich assemblage includes lithics, faunal remains and organic artefacts as well as pigments, art objects and personal adornments (Simon et al. 2014). The latter include perforated teeth of wolf and artic fox, perforated gastropods and shells and ivory pins, however, oval shaped ivory beads are the most abundant artefact type numbering 64 pieces. Except one item, all beads derive from burial 1, an interment of two new-borns (Einwögerer et al. 2006; 2008).

This investigation focuses on the production method and standardisation of the ivory beads at Krems-Wachtberg. Microscopic analysis indicates that they were produced exclusively for the burial and have never been worn before.

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Taisiya Soldatova

The problem of radiocarbon dating of the Early Upper Paleolithic sites: Sungir (Russia)

The open-air Upper Paleolithic site Sungir is located on the central part of the Russian Plain. Stone industry is characterized by parallel reduction; the main type of blank is a flake and the tool kit has two sets of tools. Analogous industry is discovered at the sites of Streletskian culture at the Middle Done. Also this industry has combined two techno-complex elements: Aurignacian and Szeletian.
Were obtained 34 radiocarbon dates of the Sungir cultural layer on the mammal bones — mammoth, horse and reindeer; 20 ^{14}C dates of the Sungir burial on the human bones; 4 ^{14}C dates on charcoal from the cultural layer and samples from human burials and 2 dates on the soil. Samples were dated by various laboratories: Geological Institute of the Russian Academy of Sciences (lab code GIN), University of Arizona (lab code AA), University of Groningen (lab code GrA), University of Oxford (lab codes OxA, OxX) and Kiel University (lab code KIA).
There are 17 ^{14}C values range between ~24 000 and 14 000 BP, 14 ^{14}C dates are in the range ~26 000-25 000 BP and 29 ^{14}C dates are in the range ~30 000-27 000 BP. There are 40 ^{14}C dates from the cultural layer of the Sungir site run on animal bones and charcoal and 24 values run on human bones from the burials.
It must be mentioned that the ^{14}C values up to 20 000 BP were obtained in a laboratory of the Geological Institute of the USSR Academy of Sciences when the radiocarbon dating method was at the stage of development; the samples' age, according to the excavation director O.N. Bader, must have been much older in reality (Bader 1978).
^{14}C values run on the samples of tibiae found in the burials S 1, S 2 and S 3 in the laboratories of

the University of Oxford range from 24 100 to 22 930 BP which contradicts with the data obtained in the radiocarbon laboratory of Arizona State University after analysing the ribs' fragments from the same burials (from 26 200 to 19 160 BP) (Homo sungirensis... 2000). Researches recognise the substantial discrepancy in the results and conclude that a re-examination of the analyses is needed (Kuzmin et al. 2004). AMS ^{14}C dates of the S 1 individual's femur sample and the S 3 individual's humerus were obtained in the Leibniz Laboratory at the Christian-Albrecht-University of Kiel, Germany. The dates are 27 050 ± 210 (KIA-27006) and 26 000 ± 410 (KIA-27007) BP respectively (Dobrovolskaya et al. 2012).

So, this ^{14}C dates have no correlation with each other and contradict with the cultural layer dates: 4 dates of the grave 1 carried out in 3 different laboratories are 4000-5000 years later than the main part of the cultural layers dates.

Due to the fact that ^{14}C dates obtained in Oxford, Arizona and Kiel contradict with each other, there was an attempt to carry out the analysis using the AMS hydroxyproline dating system. The results obtained from samples from the double burial (S 2, S 3) and from a mammoth bone found at the site were published in 2012: 30 100 ± 550 (OxX-2395-6), 30 000 ± 550 (OxX-2395-6), 30100 ± 400 (OxX-2395-6) BP respectively (Marom et al. 2012). The AMS dates strongly correlate and, according to the authors of the study, reflect the actual age of the examined burials (Marom et al. 2012).

In 2013 new AMS hydroxyproline dating results of the samples S 1 and S 4 obtained in the Oxford laboratory were published: 28890 ± 430 (OxA-X-2464-12) and 29820 ± 280 (OxA-X-2462-52) BP respectively (Nalawade-Chavan et al. 2013). The researchers who carried out the analyses state that the results compared with the results published in 2012 and are believed to be reliable (Nalawade-Chavan et al. 2013: 5). Besides, it is repeatedly underlined that the samples have traces of contamination produced as a result of museum conservation (Nalawade-Chavan et al. 2013: 5). Therefore, the fairly reliable recent AMS hydroxyproline dating results of the samples S 1, S 2, S 3, S 4 and of the mammoth bone indicate that the samples' age is approximately 30 000 — 28 000 BP or 34 000 — 31 000 calBP.

There are three ^{14}C values run on horse bones: 27 400 ± 400 (GIN-9033), 26 300 ± 300 (GIN-9034) and 25 740 ± 600 (GIN-9001). It is hard to relyon to the fact that the analysis was carried out only using 5-7 bone fragments or whole bones of the animals, and, thus, the results may be a weighted average of specimens of different ages.

27 ^{14}C dates run on mammoth bones also raise questions. It is known that a prehistoric man used bones as a source of fuel and raw material for tools production and construction of dwellings, obtaining them not only when hunting but also when gathering. That is why it cannot be stated that the mammoth bones found at the site coincide chronologically with the human activity at the place (e.g., Sulerzhitskiy 2004).

There are three ^{14}C values run on reindeer bones: 27 260 ± 500 (GIN-9036), 26 900 ± 260 (GIN-9035), 24 430 ± 400 (GrN-5446). They appear to be more accurate than the others due to good sample materials, since most of the site's bone debris are of reindeer (Alexeeva, 1999; Gromov, 1966). V.I. Gromov underlines, "The debris contain skull fragments and all bones of postcranial skeleton". He also states, "Many bones have traces of manmade splitting for brain extraction" (Gromov 1966: 78). In addition, reindeer antler was used extensively by the site's population for tools production — 28 items or 16% of all the tools found in the cultural layer were made of solid organic raw material (Soldatova, 2014). I.e. reindeer was one of the main game animals. Therefore, in the author's opinion, ^{14}C ages of the animal bones under examination are fairly reliable. The calendar age range for there bones is ~31 000—29 000 calBP.

Charcoal analyses results are represented by four ^{14}C dates: 25 500 ± 200 (GrN-5425), 22 500 ± 600 (GIN-326b), 21 800 ± 1 000 (GIN-326a), 19 780 ± 80 (LE-1058). The latter, 19 780 ± 80 BP, was obtained in a laboratory at the Leningrad department of the Institute of Archaeology of the USSR Academy of Sciences, and, in O.N. Bader's opinion did not prove to be accurate (Bader 1978: 65). Next two ^{14}C results are controversial: the material for the analysis were charcoal samples taken either from the cultural layer, or from hearth, or from the floor of the burial (Bader 1978: 64; Sinitsyn, Praslov 1997: 60; Sulerzhitskiy et al. 2000: 32). It appears to be that only 25 500 ± 200 (GrN-5425) ^{14}C is more or less reliable.

Consequently, despite a significant amount of radiocarbon dating figures — 60 ^{14}C values —, there still remain many questions concerning the Sungir site's age. The most reliable data set has 23 ^{14}C which range from 28 000 to 27 000 BP. The calendar age range between ~32 000 — 31 000 calBP.

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Benjamin Spies
Borders, groups and territories - The Early Mesolithic in southern Germany

Southern Germany is one of the richest Mesolithic landscapes in Europe (Kozlowski 2009), with a research tradition of nearly 100 years. Within the framework of a doctoral thesis at the Institute for Prehistory at the Friedrich-Alexander-University Erlangen-Nuremberg, an overview of the number and distribution of Mesolithic sites in the entire region was compiled for the first time. This compilation shows areas with a high density of sites, which are contrasted by landscapes with almost no Mesolithic finds.
Considering the depth of time the question arises, if differences in the archaeological remains are visible, which could be interpreted as evidence for different Mesolithic groups and their circulating areas. Since almost all sites are surface collections, only lithic artefacts are available for such investigations. However, especially the numerous and locally diverse raw materials in southern Germany offer the possibility to reconstruct the movement patterns of these early Holocene hunter-gatherer societies.
An analysis of selected inventories shows, that especially the distribution of Jurassic chert from the Franconian-Swabian Alb is a suitable marker for the reconstruction of movement patterns in southern Germany. A good example for this is the Mesolithic landscape of Franconia. While Jurassic chert is always the most frequently used raw material on all Franconian sites, it is almost completely absent on sites in the northern bordering regions (Spies/Fach 2017,115 ff.). At the same time, the boundary of the distribution of Jurassic chert corresponds to different watersheds, which may have served as an orientation for the early Holocene hunters and gatherers.
This concordance of archaeological and natural boundaries makes it likely that at least in this region a clear boundary for neighbouring circulating areas can be outlined. Only on this basis of a suitable defined territory, further investigations on subsistence and land use patterns of hunter-gatherer groups make sense.

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Neanderthals in the Open – Depositional Environment and Site Formation at 'Ein Qashish, Israel

'Ein Qashish is an open-air site complex located on the floodplain of the Qishon stream in northern Israel (Hovers et al., 2014). Rescue excavations in 2013 unearthed four Middle Palaeolithic occupation levels that contain lithic tools and butchery remains. Noteworthy is the preservation of several Neanderthal fossils (Been et al., 2017), previously unknown from open air sites in the Levant and hardly anywhere in Eurasia. Thus, the archaeological record at 'Ein Qashish presents an exceptional opportunity to broaden our understanding of Neanderthal behaviour in the open landscape.

We present a geoarchaeological study of the sediments of the site (Stahlschmidt et al., accepted). In this study, we coupled field observations with sedimentological, micromorphological, mineralogical, elemental and isotopic analyses to investigate the depositional context of the Neanderthal occupation of the site and the integrity of the archaeological record. Our results show that the sedimentary sequence formed in a generally low-energy alluvial environment with additional evidence for seasonal ponding. Post-depositional processes include argilliturbation and the formation of calcite and gypsum pedofeatures. The data suggest limited disturbance of the archaeological record.
We did not observe combustion features or fire-related residues at the site, but burnt lithics were observed in low frequencies. The question then is if the rarity of evidence for fire is caused by human behaviour, taphonomy, or both. For 'Ein Qashish, we do not have evidence for post-depositional processes that will result in the disappearance of evidence for combustion and therefore cautiously propose that this absence of evidence for controlled fire at the excavated portion of the site is related to human behaviour.

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Johann Friedrich Tolksdorf[1], Ingo Kraft[1], Gabriele Wagner[1] & Harald Floss[2]
The painted pebbles of Mas d'Azil in the Dresden Collection: Provenience and non-destructive analyses of the colourant

The painted pebbles of the Mas d'Azil (Dep. Ariège, SW France) constitute a large, yet enigmatic group of objects related to artistic/religious life of the Late Palaeolithic. Unfortunately, the site has been excavated during the late 19th/20th century in several poorly documented campaigns and resulted in the split-up of the artefacts into an unknown number of collections and the production of forged pebbles. Against this backdrop, the well-documented and very early acquisition of a set of 31 pebbles directly from the first excavator E. Piette by the Royal Collection at Dresden in 1899 provides a rather authentic set for further non-destructive studies. This is supported by both the stylistic analyses of the motives and the microscopic assessment of sediments and micro-charcoals preserved in old fissures. Also the traces of tools used for the painting do not contradict the authenticity.

While analyses of the colourants on selected pebbles by XRD proved difficult due to the background signal from the underlying minerals, further analyses by Raman spectroscopy provided evidence for a massive presence haematite. However, these techniques are rather incapable of tracing organic compounds and no signs of binders were documented.
Additionally, Visible Light Spectroscopy (VIS) was used to recorded and compare the colour properties of the painted surfaces and the mineral background. The results show that producing an intense red and not a palette of colours and nuances was the main focus. Based on the dominance of hematite proven by XRD/Raman, these colour properties even allow for an estimation of the hematite content ranging mainly from 3-6% with extremes beyond 15%. Diffuse coatings of red material recorded on some surface areas could possibly relate to the occurrence of red stained areas in the excavation sediment and therefore prove either the on-site preparation or other applications for the red pigments.

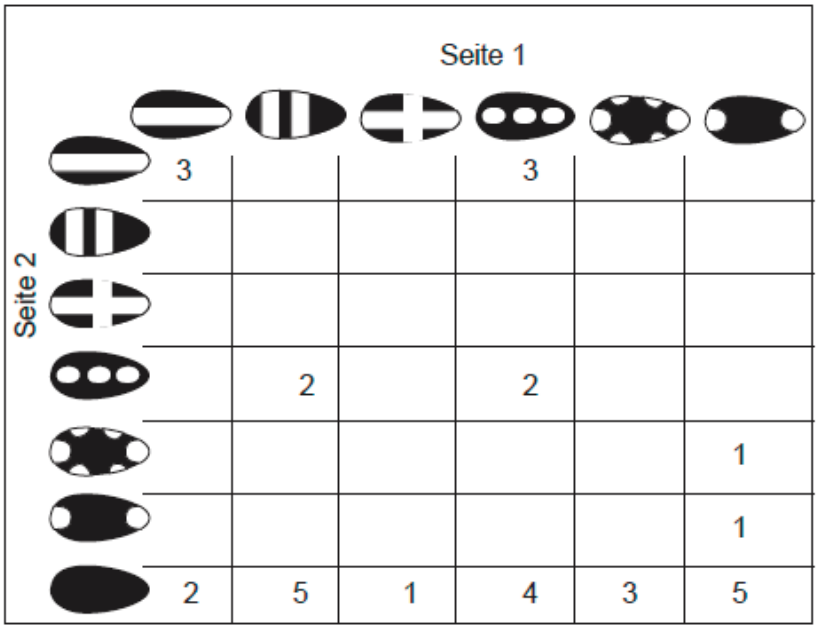

Fig. 1. Overview of the ornament patterns on the pebbles in the Archaeological Archive of Saxony, Dresden (one pebble is of unknown provenience, possibly collection Hauser or Wilke?)

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Giulia Toniato[1], Britt M. Starkovich[1,3] & Nicholas J. Conard[2,3]

Middle and Upper Palaeolithic settlement dynamics in the Lauchert Valley of the Swabian Jura: report on the faunal assemblages and new excavation results

The Swabian Jura has been the focus of intensive archaeological investigations for over a century. As research progresses, this area has proved useful in gaining a more fine-grained understanding of Middle and Upper Palaeolithic human mobility and occupation patterns, both at a local and regional scale. While systematic research has been carried out for the Ach and Lone valleys, other tributary valleys of the Danube have only been marginally investigated despite their known archaeological potential, the Lauchert Valley being one of them. Archaeological excavations in the area were carried out by Eduard Peters (Peters, 1936; Peters & Rieth, 1936) during the first half of the 20th century. Following the tumultuous events of WW II that led to the loss of most finds and of all excavation documentation, no further fieldwork was undertaken until recently. Here, we present the results of the new excavation campaigns conducted in 2016 and 2017 at Schafstall II, a rock shelter previously investigated by Peters and attributed to the Aurignacian (Conard et al. 2016). We combine these results with a reassessment of the faunal assemblage collected by Peters. This new work provides us with a contextualised knowledge of the site that is useful in reconstructing the old excavations and the setting of the finds. Such a framework, together with the analysis and interpretation of the incomplete faunal assemblages recovered from other sites in the Lauchert Valley, allows us to evaluate with more precision the degree of anthropogenic activities at the various sites and how human and carnivore interactions shaped landscape and site use in the region throughout the Middle and Upper Palaeolithic.

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Elaine Turner[1] & Petr Neruda[2]

Bone retouchers and other bone tools from Last Interglacial deposits at Kůlna Cave, Level 11

Located some 30km north of Brno, in the Moravian Karst, Kůlna is one of the largest Palaeolithic cave sites in Eastern Europe. Over 150,000 years of repeated occupations attest to the important role of the cave as a focal point in the Palaeolithic landscape. The Middle Palaeolithic Level 11 is attributed to the Last Interglacial; two younger phases to the end of this warm phase (K. Valoch 1998). The excavator of the cave, Karel Valoch (1998), first identified bone tools in this and other levels in the cave, and organic tools were also recognised in later analyses of the fauna by P. Auguste (2002), M. Patou-Mathis (2005) and (Neruda, Lázničková-Galetová,Dreslerová 2011).

We report here on the preliminary findings of an analysis of 185 bone fragments from Level 11. These fragments show distinctive, usually well-defined, areas of imprints and abrasions

on their surfaces, called "Narbenfelder" (W. Taute 1965), resulting from forceful percussion applied to bone blanks when used for shaping or refining the edges of stone tools. A total of 147 of these finds have single areas of use; 38 have two or more use-areas. A range of bone blanks had been selected for retouching tools, but the majority of them are shaft fragments of the major long bones (humerus, radius, femur, tibia, metapodia). Rarer are retouchers on bones of the pelvis, mandible and ribs. An intact canine tooth of a bear had also been utilised. Most of the retouchers are made of horse bones, consistent with the dominance of horse remains in the faunal assemblage; but bones of further species otherwise present at the site had also been selected – large bovine, giant deer, red deer. Comparison of the morphology of the retouching marks with other published specimens (Mallye et al. 2012) indicates that the bulk of the blanks were employed when the bone was still in a relatively fresh state, and had been intensively used.
In addition, we present a small assemblage of finds displaying different traces of damage and possible evidence of deliberate shaping or modification. Three finds, two horse metapodials horse and a cervid radius show crushing damage, probably related to their use as hammers. Four bone shaft fragments have flat removals located on the outer and inner faces of one edge, so that they resemble scrapers. One of these finds has been used as a retoucher. Finally, flat removals from one face of a bone fragment underline the "pointed" shape of the piece. This find also shows traces of retoucher use.

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Neanderthal activities between ~130 ka and ~40 ka at Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

Sima de las Palomas del Cabezo Gordo, overlooking the Mediterranean Sea, is a karst shaft in which mining *ca*. 1900 left a 20 m-high column of sediments exposed, from which a

spelaeologist, descending by abseil in 1991, removed a Neanderthal mandible fused in breccia to both maxillae, all with complete adult dentition (1,2,3). Miners left the shaft almost empty, save for ~4 m^2 access to which required erecting a scaffolding tower beside the column. All excavated sediment was wet-sieved. Mine rubble was dry-sieved. Skeletal elements of 13 Neanderthals, Mousterian artifacts, and palaeontological remains exist. Excavation has reached a depth of ~6 m below the rock roof. The deepest 2.5 m, with MIS-5 OSL dates ~130-100 ka (4), indicate accumulation of refuse including abundant burnt and unburnt animal bones (ungulates, lagomorphs, tortoise, porcupine), knapped artifacts (chert, marble, limestone, quartz, quartzite), smooth allochthonous spherical cobbles, Neanderthal teeth, and a mandibular fragment (phase 1). Overlying rock-hard conglomerate gave MIS-4 U-ser dates ~68-65 ka (4). Above it, entombed in an MIS-3 partly-cemented scree slope (*éboulis*), lay anatomically-connected skeletal parts of a Neanderthal woman, child, and another adult (2,4,5,6), dated by U-ser to ~55-50 ka (1,2,7), alongside two articulated leopard paws, burnt horse astragali, and knapped chert (phase 2). The woman's and child's skeletons had flexed elbows with uplifted hands beside their skulls (an arrangement encountered elsewhere at Mousterian sites: 8), suggesting human intervention before *rigor mortis* developed. The 1991 fossil came from the *éboulis*. Maybe corpses were covered with rocks to deter scavenging animals. The skeletons indicate exceptionally short Neanderthals, perhaps an outcome of genetic drift. Phytoliths in dental calculus imply mastication of plants (9); dental caries occurred (10). Removal of breccia cemented to Neanderthal bones is ongoing using *CTS* vibroincisors. Computer-assisted tomography has been undertaken to enable virtual reconstruction. Around the *éboulis* finer sediments accumulated ~47-40 ka (1,2,7), palynologically (11) appropriate for ~47-43 ka, filling up the remaining cavity to the rock roof, and containing a deeply-lying ash lens, fragmentary Neanderthal skeletal elements and Mousterian artifacts; probably resulting from activities beside the mouth of the shaft (phase 3).

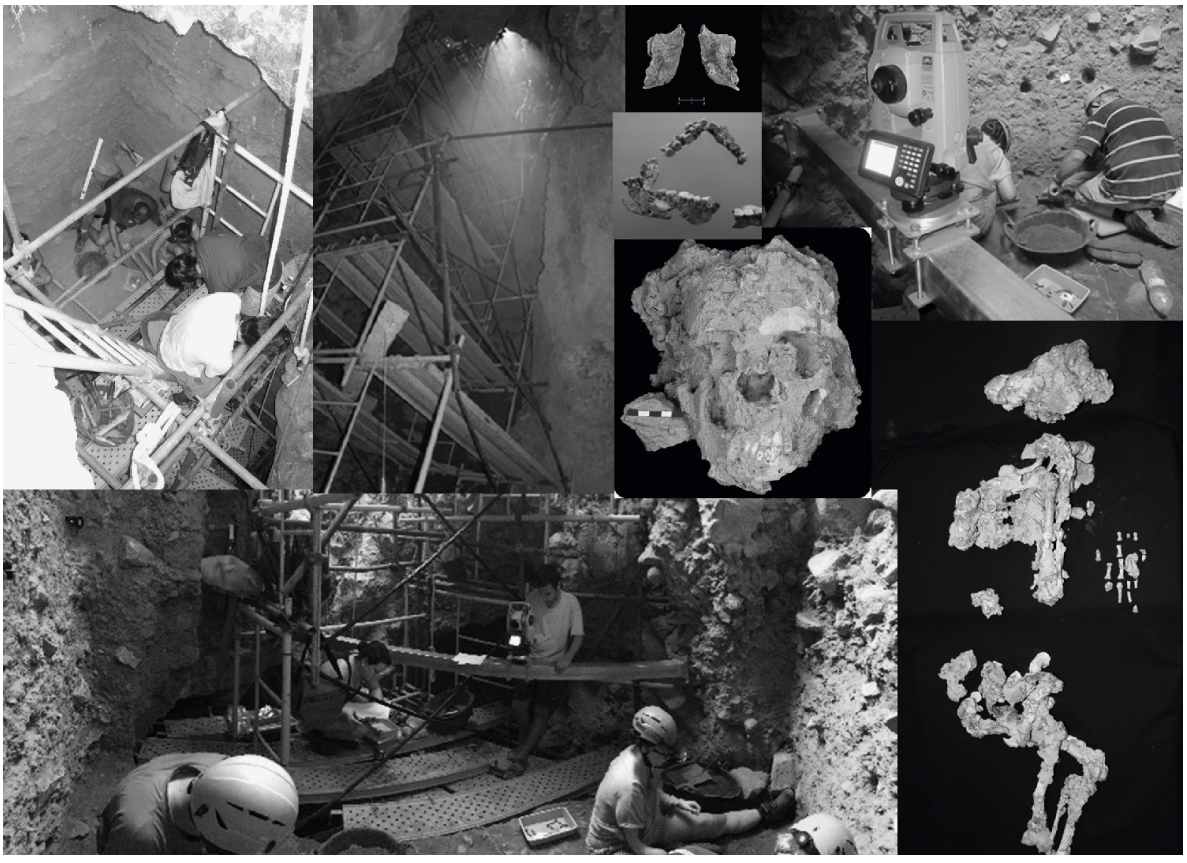

Fig. 1. Sima de las Palomas del Cabezo.

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Isotopic insights into the paleoecology (diet, mobility) of late Neandertals in North-West Europe

The Troisième caverne of Goyet (Belgium) recently yielded numerous new human remains belonging to the last Neandertals of Northwestern Europe. Along with the late Neandertal individuals from the nearby site of Spy and coeval faunal remains from Scladina cave, the Troisième caverne and Spy, this Belgian skeletal material provides a unique opportunity to investigate specific paleoecological aspects of the last Neandertals in Northwestern Europe, especially their subsistence and mobility patterns. All of these sites yielded skeletal remains with very good collagen preservation, allowing us to measure stable isotopes as direct trackers of mobility, habitat and diet.
Previous studies of carbon and nitrogen stable isotopes of both faunal and Neandertal bone collagen from the above mentioned sites have crucial information on Neandertal diets and habitats. Here, special attention has been given to the sulphur isotopic composition of the same bone samples. Sulphur isotopic composition is linked to the type of geological bedrock that determines the sulphur isotope ratio of the plants at the bottom of the foodweb and, therefore, documents aspects of herbivore, omnivore and carnivore habitat distributions. Significant differences were found among the Belgian archeological sites and the observed patterns suggest different foraging areas for the Neandertals from Spy and Goyet. In this work, we demonstrate that both Neandertal groups focused on the same prey species, but

foraged in different areas. Interestingly, the Goyet Neandertals, who were cannibalized, foraged in a different region from the local ecosystem where they were found, whereas the local Spy Neandertals show no evidence of cannibalism. Even if the two Neandertal sites are geographically close to each other, the mobility patterns of each group were clearly different over a long period of their lives.
The type of multi isotopic study we present here is rather comprehensive, not only for this region, but for the whole Late Pleistocene, and therefore contributes significantly to a deeper understanding of different behavioral patterns of late Neandertals across their landscape.

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Gillian L. Wong[1], Britt M. Starkovich[1,2] & Nicholas J. Conard[2,3]
Human Subsistence and Environment in the Lone Valley of Southwestern Germany during the Magdalenian

Many studies of prehistoric hunter-gatherers have shown that environmental conditions often act as drivers of human subsistence behavior. In order to interpret the extent of environmental impacts on these behavior, directly comparable archaeological and paleoenvironmental datasets are ideal but often not available. The Swabian Jura of southwestern Germany is home to numerous cave and rockshelter sites that include these types of directly comparable datasets. Although researchers have reconstructed local paleoenvironments in this region using data that are found in direct association with archaeological remains, none of these studies specifically addresses the Magdalenian. We reconstruct paleoenvironments and human subsistence behavior during the Magdalenian using faunal remains from Langmahdhalde, a recently excavated rock shelter in the Lone Valley of the Swabian Jura. We use the Langmahdhalde small mammal assemblage to interpret local past environments and the macrofaunal assemblage to evaluate human subsistence behavior. The macrofaunal assemblage is dominated by horse (*Equus ferus*), reindeer (*Rangifer tarandus*), red deer (*Cervus elaphus*), and hare (*Lepus* sp.) and there are also several medium-sized bird remains, such as ptarmigan (*Lagopus* sp.). We find that a significant portion of the assemblage was likely deposited as a result of human butchery activities. The small mammal assemblage shows a clear trend of dry, open steppe and/or tundra environments in the post-Last Glacial Maximum Pleistocene. We discuss these results in the context of the long research history in the Swabian Jura and current interpretations of Magdalenian site use and settlement patterns in Central Europe.

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Excursions of the 60th Obermaier Meeting

The two excursions of the 60th Obermaier meeting will bring us to two areas of Catalonia (Fig. 1). On the first day, we will visit the Middle Palaeolithic sites of Toll and Teixoneres Caves and Abric Romaní in the Province of Barcelona. The second day we will travel to the South of the Province of Tarragona to discover the rock art in the Abric dels Rossegadors, the Abrics del Ermita, and finally the *Museu de les Terres de l'Ebre*.

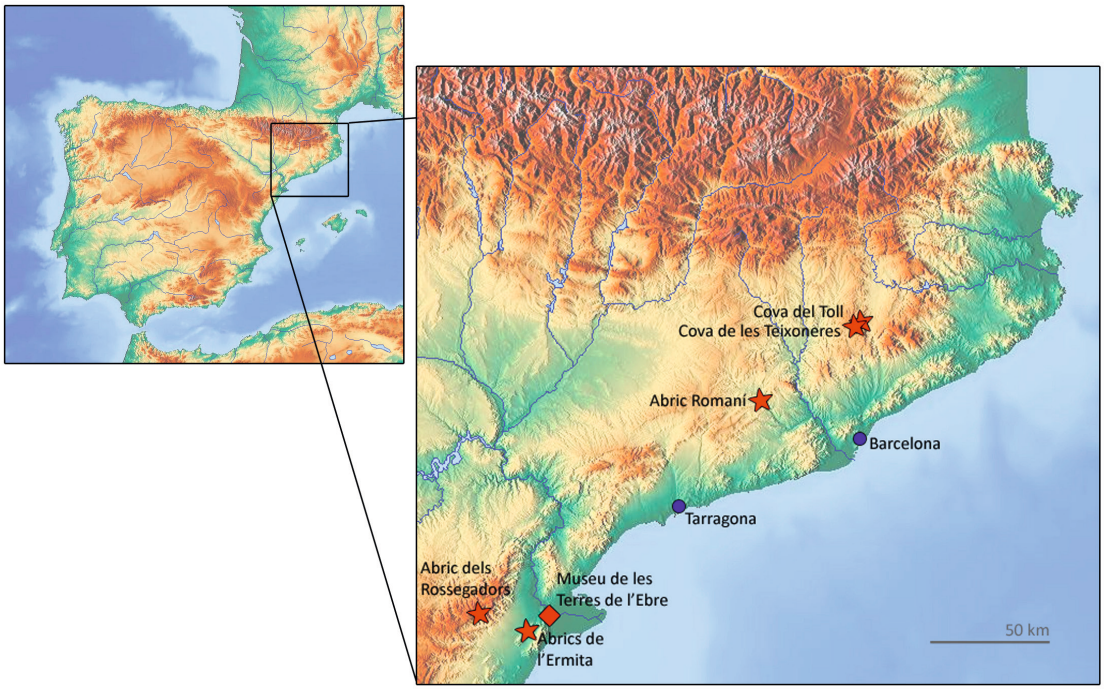

Fig. 1. Location of the archaeological sites and museum visited during the excursions.

Friday, April 6th, 2018 Excursion A: (probably 8:30 – ca. 18:00)

Toll and Teixoneres Caves

Rosell, J., Blasco, R., Rivals, F.

The Toll Caves complex is located abound 4 km East from the town of Moià (Moianès, Barcelona), in the valley of the spring of Mal (Fig. 2). The complex is composed by a series of karstic duct-like galleries developed in Neogene limestones (Collsuspina formation), at 760 m a.s.l. Its coordinates are 41º 48' 25'' N and 2º 09' 02'' E. The archaeological site was discovered at the end of 1940s of the last century, when several members of the *Grup Muntanyenc* from Barcelona and the *Grup Espeleològic del Moianés* were exploring the cave and found Neolithic pottery very well preserved. During the 1950s, the first archaeological excavations were carried out, both in Toll Cave conducted by J.F. de Villalta and M. Fusté, and in Teixoneres Cave conducted by J. de C. Serra Ràfols, all of them sponsored by the local businessman S. Oller. Fieldworks at both caves consisted on different tests trenches regularly placed that brought to light relevant Pleistocene sequences, which were sealed by Neolithic and Bronze Age deposits (in Toll Cave), or by a stalagmite crust (in the case of Teixoneres Cave).
The relevance of the discoveries entailed their inclusion in the visits of the Vth INQUA Congress, held in Madrid and Barcelona in 1957 (Serra *et al*., 1957). Afterwards, fieldworks were interrupted and occasionally only some analytical studies were done, as lithic industry analysis by H. de Lumley (1971). At the beginning of the 70s, the archaeological excavation was resumed at Toll Cave by J. Guilaine and M.A. Petit. The main goal was to establish the

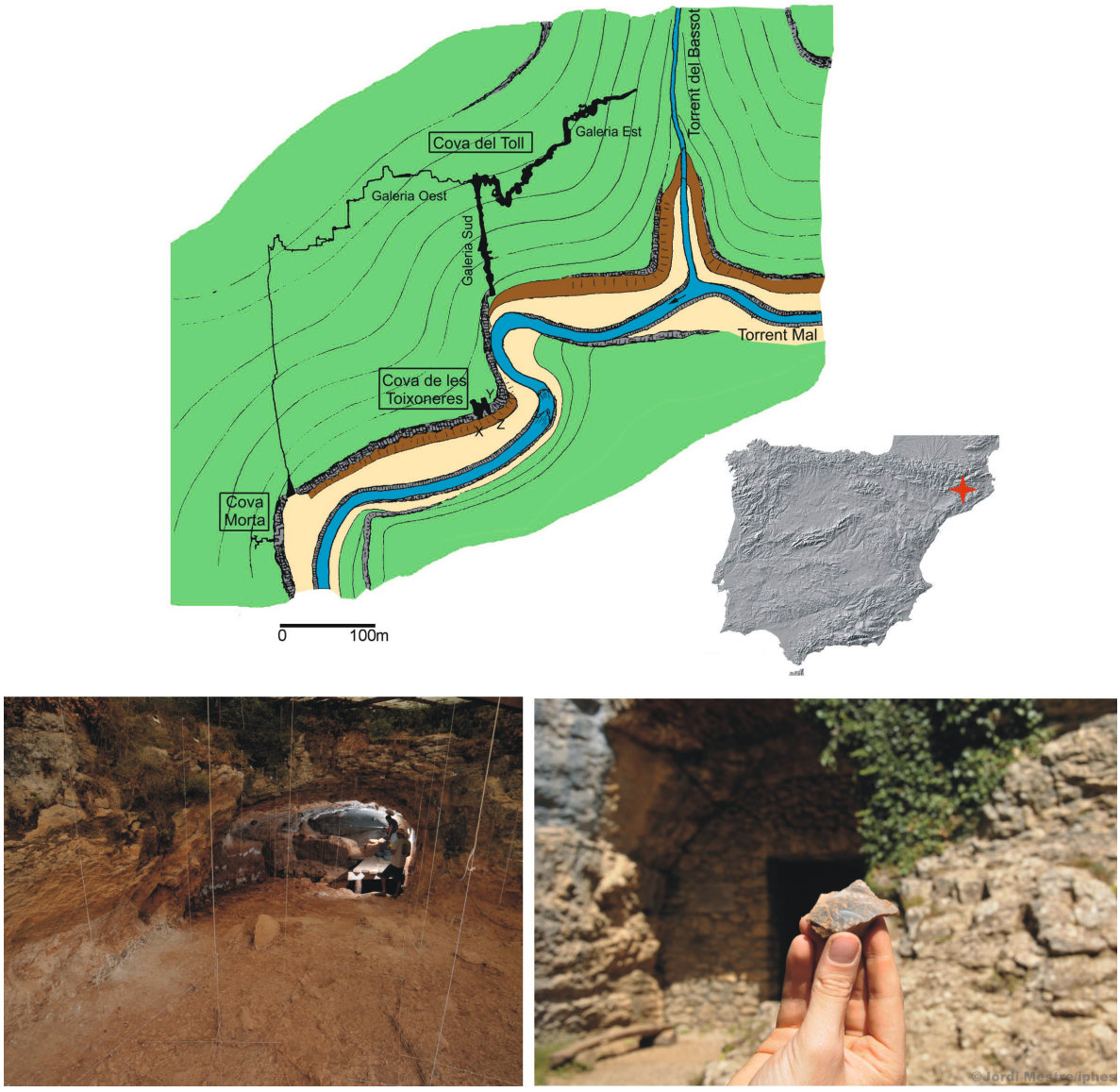

Fig. 2. Location of the Coves del Toll and Teixoneres and map of the karst. Left, Teixoneres Cave. Right, one of the lithic artefacts found in Toll Cave photographed next to the main current entry.

Neolithic sequence aimed at being the reference for the Northeastern area of the Iberian Peninsula. However, after two years the cave was abandoned again. Something similar happened with Teixoneres Cave. In the middle of the 70s, M. Castellví started again field-works looking for Quaternary fauna in Catalonia (Castellví, 1974).

It was not until the end of the 90s when D. Serrat and A. Cebrià decided to uncover the old test pits from Toll Cave that have been filled by sediments from the cave itself after several flooding episodes that occurred in 1982. This work motivated the contact with IPHES (Institut Català de Paleoecologia Humana i Evolució Social) in 2003 and enabled the beginning of the current research project.

Toll Cave has approximately 2 km length, is composed by three main galleries known as South Gallery, East Gallery and West Gallery. The current entry is located in the South gallery, a rectilinear duct about 130 m length and 3-4 m width that joins at the end with the other two galleries where a small creek runs (in winter and after periods of rain). The South gallery is the most interesting from an archaeological point of view. During the 50s the first researchers elaborated the following stratigraphy in the gallery entrance: upper deposit (0.5-1 m thick) from Neolithic and Bronze periods (Unit 1); a deposit of coarse-grained sand and gravel of 25-30 cm of thickness (Unit 2), probably originated in the last period of the Pleistocene; and underneath a deposit of more than 9 metres thick of Pleistocene sediments with

abundant faunal remains (Tab.1). Serra and colleagues (1957) described relevant accumulations of cave bear (*Ursus spelaeus*) in the lower deposit, thus Toll Cave has nowadays one of the most significant collection of this species in the Iberian Peninsula. Besides, remains of other large carnivorous as hyena (*Crocuta crocuta*), cave lion (*Panthera leo spelaea*), and wolves (*Canis lupus*), were found; also, small carnivores such as lynxes (*Lynx pardina*), wildcats (*Felis silvestris*), foxes (*Vulpes vulpes*) and badgers (*Meles meles*) were identified. Among the ungulates, Serra cited the presence of rhinoceros (cf. *Stephanorhinus* sp.), horses (*Equus ferus*), red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*) and rabbit (*Oryctolagus cuniculus*). In the lower Units, Serra et al. (1957) pointed the presence of hippopotamus (*Hippopotamus* sp.), which would situate the base of the sequence around the final of the Middle Pleistocene. At the present, part of this collection is deposited in the Natural History Museum of Barcelona. Unfortunately, much of them remains on private ownership or has been lost.

Unit	Chronocultural period	Stratigraphy		Fauna	Pollen	Paleo-environment
		Thickness	Sediment			
A	Bronze Age Chalcolithic Neolithic	60 cm 30 cm 30 cm	Sandy loose matrix	*Bos taurus, Capra hircus, Ovis aries, Cervus elaphus, Equus caballus, Meles meles, Vulpes sp., Oryctolagus cuniculus*		Mild and moist
B	Pleistocene	20 cm	Red compact clays	*Lynx pardina, Felis silvestris, M. meles, E. caballus, C. elaphus*		Cold and moist
C	Pleistocene	-	Interspersed sands			
D	Pleistocene	20 cm	Red sandy clays	*Ursus spelaeus, Crocuta crocuta spelaea, Canis lupus, M. meles, Lynx pardina, C. elaphus, Capreolus capreolus*	*Pinus* (49%)	
E	Pleistocene	20 cm	Clay with abundant hyena coprolites	*Hyaena spelaea*	Pine forest	
F	Pleistocene	30 cm	Red compact clay interspersed with gravels	*U. spelaeus, C. crocuta spelaea, C. elaphus, C. capreolus, Sus scrofa, Erinaceus europaeus, Talpa europaea, Apodemus sylvaticus, Plecotus auritus*		
G	Pleistocene	25 cm	Laminated clay	*U. spelaeus*		
H	Pleistocene	35 cm	Angular gravel in loose clay matrix	*U. spelaeus, Canis* sp., *C. c. spelaea, F. silvestris, L. pardina, M. meles, O. cuniculus, Bison priscus, Bos primigenius, Capra ibex, Rupicapra rupicapra, C. elaphus, S. scrofa, E. caballus,* cf. *Stephanorhinus* sp., *Castor fiber, Microtus nivalis*		Very cold and moist
I	Pleistocene	20 cm	Red compact clays	*U. spelaeus, C. crocuta spelaea, E. caballus, B. priscus, Stephanorhinus* sp., *Hippopotamus* sp.		Cool conditions
J	Pleistocene	40 cm	Very compact dark clays with angular gravels	*U. spelaeus*		
K	Pleistocene	120 cm	Sandy loose clays with large boulders collapsed from the ceiling of the cave	*U. spelaeus, S. scrofa, Talpa sp., E. caballus, Stephanorhinus* sp.		Environment flooded with water
L		70 cm	Clay. Sterile			
M		40 cm	Sandy clays. Contains fauna			
N		200 cm	Coarse-grained sands with laminations of clay and manganese. Contains fauna.			

Tab. 1. Stratigraphic details from Toll Cave (Source: Bergadá and Serrat, 2001).

The current research project in this cave started in 2004. The main goal is to produce data regarding the behaviour of large carnivores during the final of the Middle and Upper Pleistocene, as well as bring light on their interaction with Middle Palaeolithic human groups. Several cave bear teeth were sent to the Biomolecular Stratigraphy Laboratory of the School of Mining Engineering of Madrid and were dated by aminoacid racemization. They place the Unit 4 in a chronological span between 57.9 and 69.8 ka (Refs. LEB 12755-12757).
From an archaeological point of view, the cave was interpreted in the 1950s as a hibernation cave bear shelter alternated with carnivore dens (Fig. 3). However, the discovery of a Mousterian lithic tool in Unit 4 (Fig. 2), besides several cave bear bones with anthropogenic cutmarks, suggests that human groups also visited the cave occasionally. The characteristics and intensity of the human occupation of the cave is one of the priorities of the current project.

Fig. 3. Tooth-marks on a bear limb bone from Toll Cave.

The other cave at the same karstic system is Teixoneres Cave, situated at 50 m from Toll Cave. Teixoneres is a U-shaped cave with a main entrance oriented towards the South providing access to chamber X. From this chamber there is a corridor 30 m long and 6-8 m width that connects to the east with chamber Y, completely emptied during the 50s. A narrow passage in the south part communicates chamber Y with the smallest space of the cave, chamber Z, which also has an exit towards the South.
Originally, the cave deposits were sealed with a stalagmite crust (Unit I) of 20-40 cm thick (Fig. 4). This crust has been dated by U/Th to 16 ka (Tissoux et al. 2006). Underneath there are several levels of lutites (Unit II and III) with clasts of different size that have provided a large amount of faunal remains including carnivores, ungulates and other animals (Fig. 5): *Ursus spelaeus*, *Canis lupus*, *Vulpes vulpes*, *Crocuta crocuta*, *Lynx spelaea*, *Meles meles*, *Mammuthus primigenius*,

Equus ferus, *Equus hydruntinus*, *Coelodonta antiquitatis*, *Cervus elaphus*, *Capreolus capreolus*, *Bos primigenius*, *Rupicapra pyrenaica*, *Capra pyrenaica*, *Sus scrofa*, *Lepus* sp., *Oryctolagus cuniculus* and *Testudo hermanni* (Álvarez-Lao et al., 2017). This assemblage has been dated between 33 ka cal BP for Unit IIa and >51 ka for Unit IIIb (Fig. 4) (Talamo et al., 2016). Initially the cave was interpreted as a hyena den with occasional events of human occupation. Recent excavations have corroborated this idea for units II and III on the basis of the discoveries of large number of carnivores and chewed ungulate bones. Nevertheless, extended excavation at the entrance of chamber X shows a major human frequency on those units, especially under a large heap of collapsed boulders that separates Unit II and III. These occupations are evidenced by the presence of hearths, quite unstructured in some cases, surrounded by abundant lithic assemblages and faunal remains with clear anthropogenic marks (burned, cutmarks and intentional breakage).

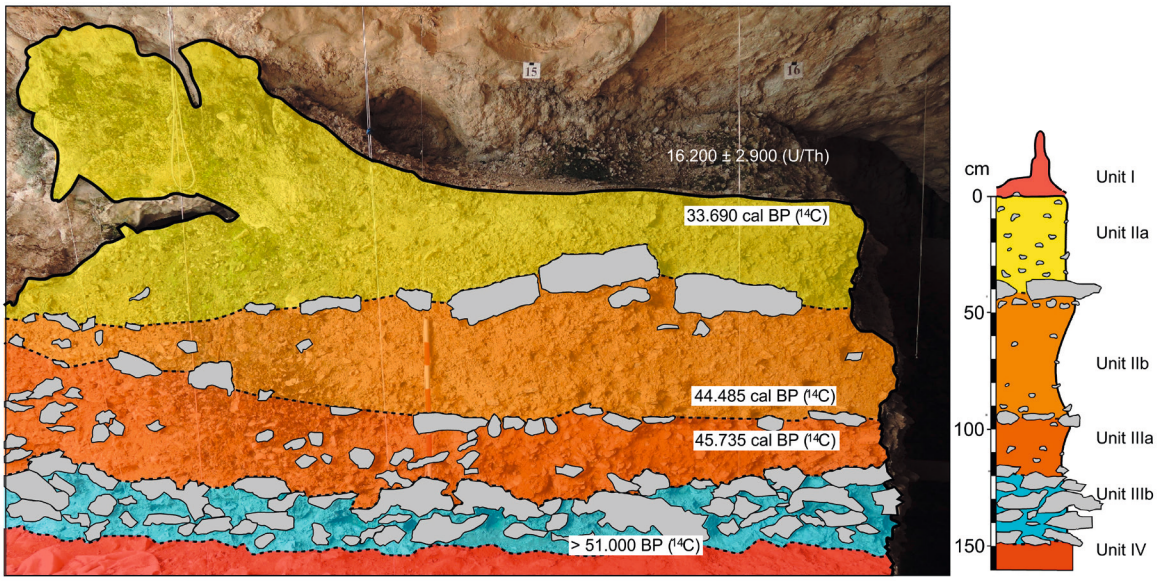

Fig. 4. Upper stratigraphic units from Teixoneres Cave.

Lithic industry, typical from the Middle Palaeolithic technocomplexes, is made on different raw materials, some of them locally available (quartz and limestone), and others from further places (chert, quartzite and hornfels) (Fig. 6). This dichotomy between autochthonous and allochthonous materials also appears in the core reduction strategies. Thus, the debitage strategies on local materials preferably consisted on orthogonal or discoidal debitage and the whole reduction sequences took place on the site. Conversely, materials procured in remote sources are obtained from *Levallois* strategies, and the debitage products mainly correspond to end-products. Flakes, cores shaped out in their last exploitation debitage, and retouched artefacts, particularly points and side scrapers are frequent. Concerning the fauna related with these human occupations, a high varied of taxa has been identified. Ungulates of different sizes (aurochs, horses, red deer and roe deer) appear together with small prey, as leporids, tortoises and birds (Rufà et al., 2015). The faunal assemblage is very fragmented and frequently corresponds to upper and lower limbs, whereas the axial skeleton is rarely represented (Fig. 7).
The general characteristics of lithic and faunal assemblages suggest the expeditious nature of human occupations in the cave, probably related to seasonal visits (Sánchez-Hernández et al., 2014, 2016). Judging from the reduced dimensions of the occupied area, the groups would be composed by few individuals. All these data seem to indicate that Teixoneres Cave would have been occasionally visited by human groups in transit along seasonal movements around the territory (Rosell et al., 2017). This reasoning would fit with a major frequency on the use of the cave by large carnivores: cave bears during hibernation and other predators during breeding. From the spatial standpoint, the main difference between human groups and carnivores is found in the occupied area. Whereas hominids seem to prefer the main entrance area (chamber X), carnivores are occupying the innermost sector of the cave (Rosell et al., 2010). Based on available data, it can be proposed a general dynamic

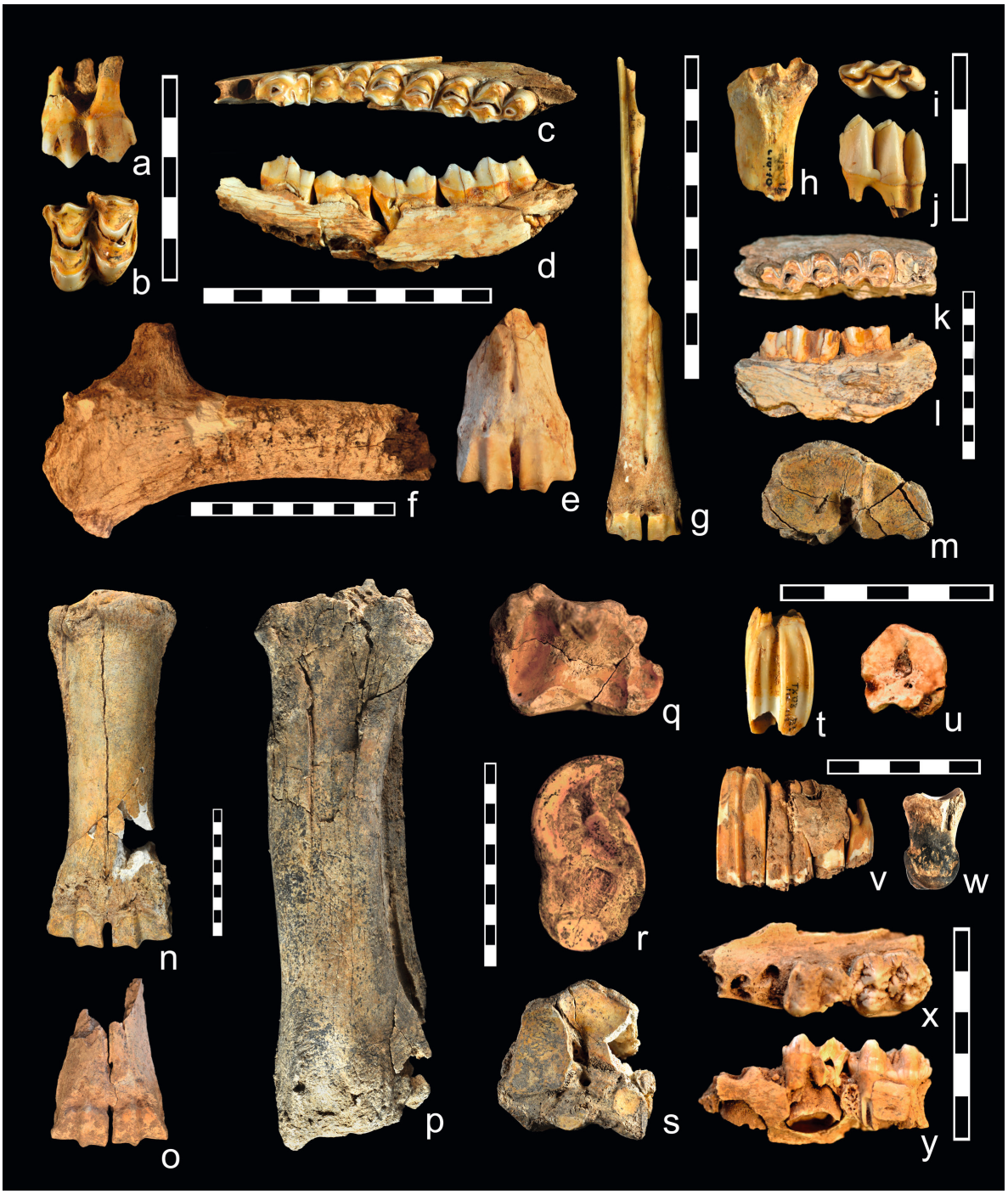

Fig. 5. Faunal remains from Teixoneres Cave. Cervus elaphus (a to f), Capreolus capreolus (g to j), Bovini cf. Bos primigenius (k to s), Rupicapra pyrenaica (t, u) Capra pyrenaica (v, w), Sus scrofa (x, y).

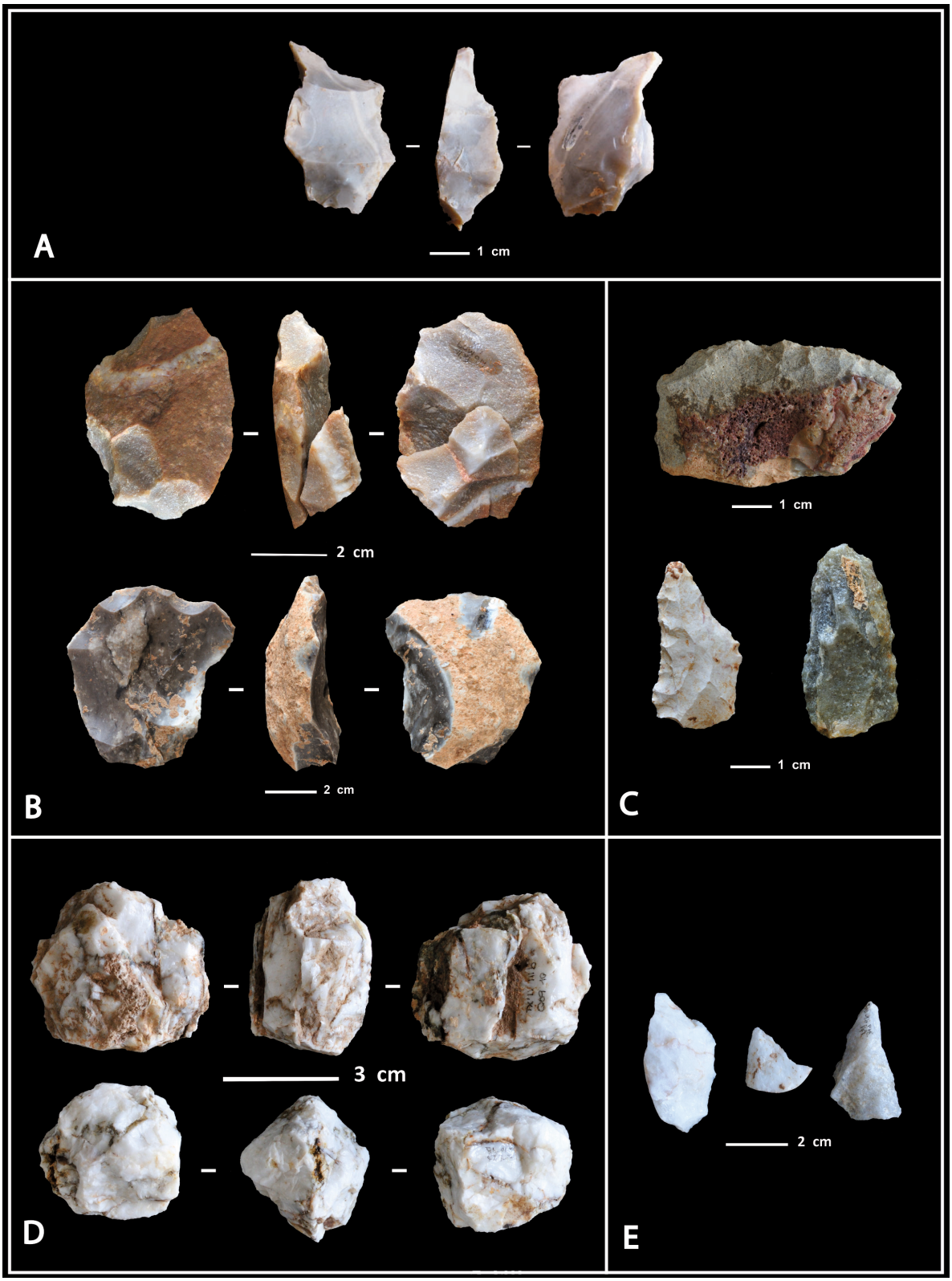

Fig. 6. Lithic artefacts recovered at Teixoneres Cave.

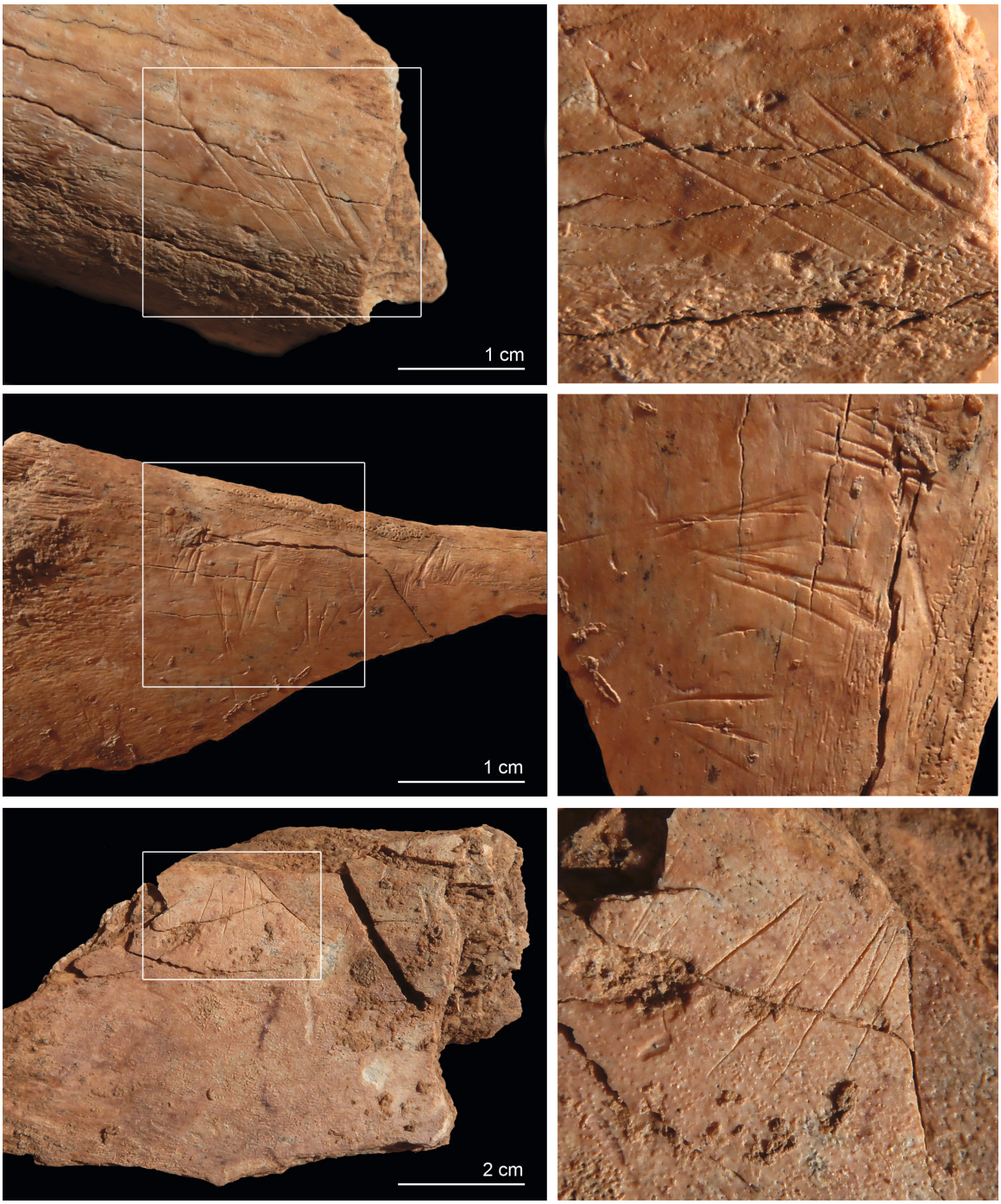

Fig. 7. Cut marks on bones from Teixoneres Cave.

in the cave. It seems likely that carnivores would have established their dens/shelters more or less constantly; these periods would have been interrupted by small groups of hominids visiting the cave sporadically. All these activities would have been developed in a context of climatic oscillations, always during a cold period, dominated by a forested landscape (López-García *et al*., 2013).

Recently, four human teeth were recovered at subunit IIIb. These specimens are currently under study. However, the preliminary data indicate that these teeth correspond as a minimum of two children and one adult.

Underneath Unit III there is another stalagmite crust dated around 90-100 ka (Unit IV) (Tissoux *et al*., 2006). The lower Units (V-IX) present two dynamics clearly differentiated. The upper section (Units V-VIII) is composed by lutites and clasts, with similar characteristics to Units II and III. The lower section (Unit IX) corresponds to fluvial facies related to the spring

of Mal. Although these stratigraphic units have not been thoroughly explored yet, a recent excavation evidenced that they also contain archaeological remains.
In summary, the Toll Cave and Teixoneres Cave represent two relevant sites for the study of the Pleistocene in Central Catalonia. These caves can potentially provide an accurate data set to enhance our knowledge of the Middle and Upper Pleistocene in that area, both from an ecological, paleontological and cultural point of view.

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Abric Romaní

Chacón, M. G., Allué, E., Saladié, P., Vallverdú, J., Vaquero, M., Carbonell, E.

The Abric Romaní site is located in the town of Capellades (Barcelona), 280 m above sea level at 41º 32' N, 1º 41' 30" E (Fig. 8). It is a large rock shelter located on the north side of the travertine cliff known as *Cinglera del Capelló* (Capellades, Barcelona) (Vallverdú et al. 2014, Vaquero et al. 2013). *La Cinglera* is a 60m thick escarpment made from lacustrine-spring travertine mesa formed by a multilayer groundwater springs of the Capellades region.

It was discovered in 1909 and firstly excavated by Amador Romaní at the beginning of the XX century (Bartrolí et al. 1995). A second phase of archaeological excavations was carried out between 1956 and 1961 (Lumley & Ripoll, 1962). Finally, the work included in the current project began at 1983. The early years of this project were led by a work group associated to the *Universitat Autònoma de Barcelona* and the *Centre de Recerques Paleoecosocials* (CRPES) under the direction of Dr Eudald Carbonell, Artur Cebrià and Dr Rafael Mora. The excavation and research team from the *Universitat Rovira i Virgili* in Tarragona, under the direction of Dr Eudald Carbonell, started to work in Abric Romaní in 1989. This team is currently continuing with the work within the *Institut Català de Paleoecologia Humana i Evolució Social* (IPHES). The interest of the research and development of these excavations is based on the spatial documentation on the structures and the archaeological materials. The large surface excavation work has occupied 10 archaeological levels (form H to Q) until nowadays (Vallverdú et al. 2014).

The stratigraphy comprises 20 m of well-stratified travertine sediments dated by U-Series and ^{14}C dates as being between 40 and 70 ka years old and containing more than 20 archaeological layers (Bischoff et al., 1988, 1994, Vallverdú et al. 2014, Vaquero et al. 2013). A new core drilling of 30 m was carried out in 2010. The presence in the core of burned travertine and sand at depths from ~13 to 18 m is strong evidence of human presence at the site at levels far below the current excavations. This core has been date by U-Series extended the occupation of the rockshelter over ~60 thousand year at least to early Marine Isotope Stage (MIS) 5 (~110 ka at the base of the core - Sharp et al. 2016). All the exposed and excavated archaeological horizons correspond to the Middle Palaeolithic, except the uppermost level A, attributed to the Early Upper Palaeolithic.

Climate variations included alternating wet and dry phases along the sequence with colder conditions than today (Vaquero et al. 2013). The palaeoecological record from Abric Romaní indicates a mosaic landscape, with different vegetal communities in the territory including forests, riparian forests, prairies, and steppe (Burjachs et al., 2012).

The excavation of such a large area combined with the high temporal resolution of the archaeological units has provided a picture of the spatial organization strategies of the Middle Palaeolithic occupants. The occupations apparently focused around well-preserved hearths that form a clustered distribution on most archaeological levels (Vaquero & Pastó, 2001). The different levels of Abric Romaní are the result of the accumulation of an unknown number of occupational events. The occupation models can be distinguished as long-term occupation events or short occupation and/or non-residential events (Vallverdú et al. 2005, 2010, Vaquero et al. 2012). In both models, the hearths were reused, especially in long-term events, which resulted in the preservation of these structures (Vallverdú et al. 2010, Vallverdú et al. 2012a). In the case of the short-term events (Vallverdú et al. 2005) the domestic areas can be isolated and differentiated better than in the long-term events, that show overlapping of different areas and places where activities occurred and sometimes is difficult to differentiate from one another (Vaquero et al. 2012).

The general characteristic of all archaeological levels of the *Abric Romani* is the fragmentation of the reduction sequences, although refitting studies shows that some of them were carried out on the spot in well-defined knapping areas (Vaquero et al. 2007, 2012, 2015). The main objective of the lithic sequences is to obtain as many knapped products as possible and these are the predominant category in all archaeological levels. Cores and retouched objects are scarce in the record (Fig. 9).

In the whole sequence, chert was the main raw material exploited usually being at least 80% of the whole lithic assemblage, followed by limestone and quartz that cover fluctuating

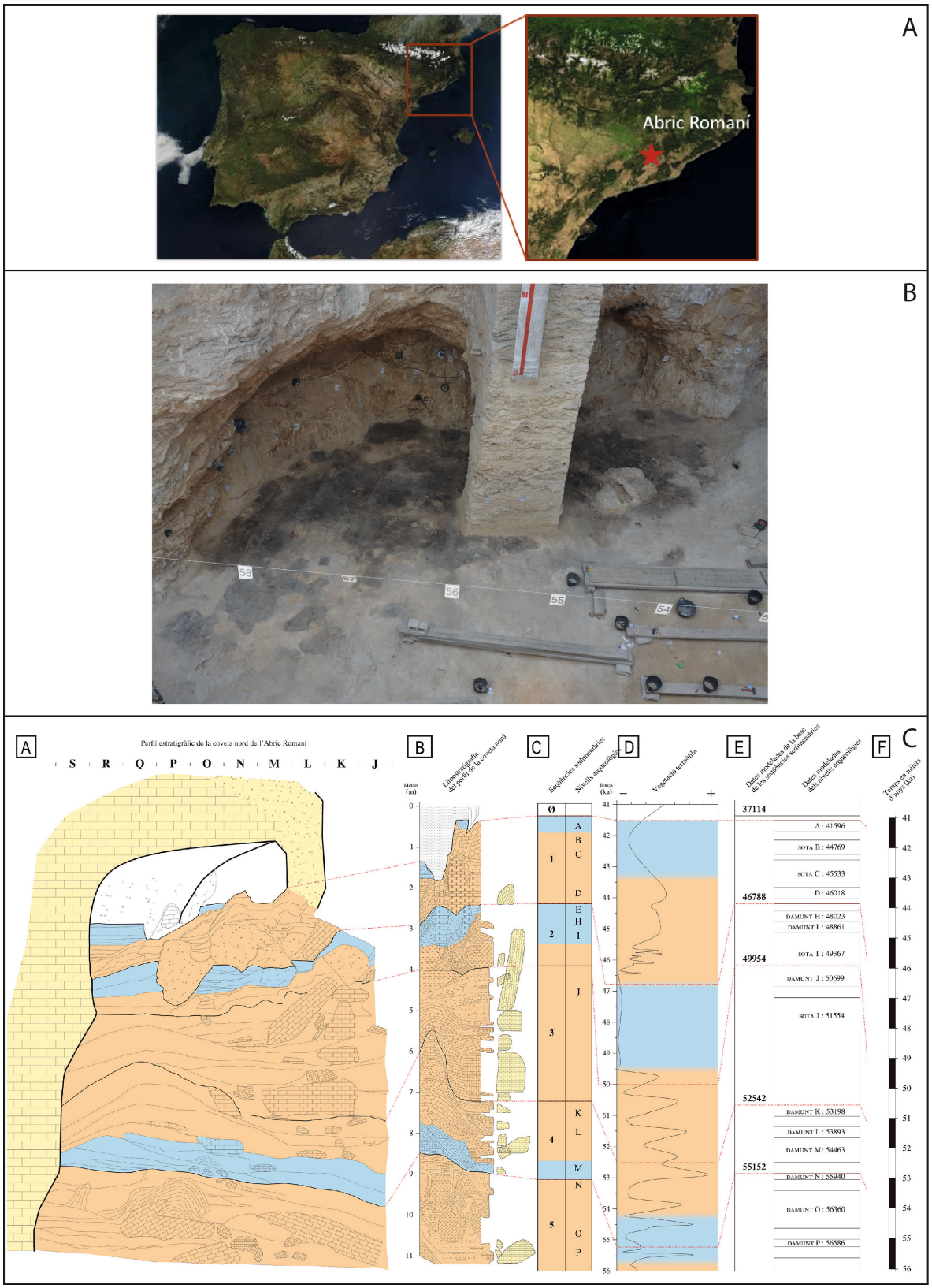

Fig. 8. Location map of the Abric Romaní and general view of archaeological level Q (Photo G. Campeny/IPHES). Unpublished stratigraphy and dates of the archaeological levels excavated until nowadays: A. stratigraphic profile, B. lithostratigraphy, C. Sedimentary sequence & archaeological levels, D. Vegetation, E. Dates and F. ka years (Figure realized by J. Vallverdú).

percentage along the deposit. Chert was mainly collected in primary or sub-primary position. It was mainly collected in semi-local areas (between 10 and 20 km from the site), with fluctuations in the percentage of chert collected in distant outcrops located approximately 30 km north-west (NW) from the site (Gómez de Soler 2009, Soto et al. 2014).

Morphotechnical analysis of the cores and knapped products has allowed to describe the different types of reduction sequences performed at the site: tested cores without later transformation, hierarchical centripetal cores, Levallois method (essentially recurrent centripetal), discoid methods, polyhedral morphologies and fragments or flakes with some removals without any predetermined organisation or schema. The distribution of the different strategies is not homogeneous on all levels. Thus, in the upper levels (level E) there is a tendency for hierarchical strategies. However, in the intermediary levels (levels I, J, K, L, M, N) there is a preference for non-hierarchical and expedient strategies. At lower levels O and P the existence of hierarchical strategies is identified again, with a high number of cores and knapped products that show the use of the Levallois method (level O) and laminar production (level P). The main retouched artifacts in all levels are the denticulates and notches (until 90%) but also and scrapers are presents (Fig. 9).

At the faunal assemblage present a total of 13 different taxa have been identified (Table 2), although deer (*Cervus elaphus*) and horses (*Equus ferus*) are the most common species in all levels of the stratigraphic sequence. Aurochs (*Bos primigenius*) and chamois (*Rupicapra pyrenaica*) are also present. The presence of rhinoceros (*Stephanorhinus hemitoechus*) has also been documented at various levels, although the remains are very scarce. Despite the high predominance of herbivores, some carnivore remains have also been recovered (Table 2). These are most abundant in the upper part of the sequence (up to level E) where a cave environment allows the presence of these animals to be associated with the establishment of occasional dens. Apart from the natural intrusion of carnivores in levels B and O, remains of *Lynx sp*. and *Felis silvestris* have been documented, respectively, with cut marks and which are the result of the process and consume by Neanderthals (Gabucio et al. 2014, 2017).

The skeletal profiles show a high presence of survival items: craniums, jaws, diaphysis fragments of long leg bones (Fig. 10). The first studies established that this representation was due to the different ways prey was transported. The Neanderthals of the Abric Romaní developed variable transport strategies for medium-sized andlarge animals. It seems that the postcranial axial skeleton was transported only in a few events and once inside the Abric Romaí was highly sensitive to destruction by taphonomic processes, among those are the produced by the Neanderthals. However, the decision to transport or discard at the kill/butchering site would not have been made in relation to the size-weight difference between large and medium-sized animals (Marín et al. 2017a, 2017b).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
***Ursus* sp.**		X											X		X	
Canis lupus		X			X											X
Panthera leo spelaea									X							
Panthera pardus				X												
***Lynx* sp.**	X	X			X											
Felis silvestris	X	X											X		X	
Crocuta crocuta	X	X			X								X			
Proboscidea indet.					X											
Stephanorhinus hemitoechus								X					X		X	
Equus ferus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cervus elaphus	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bos primigenius					X				X	X	X	X	X	X	X	X
Rupicapra pyrenaica	X	X		X	X	X	X	X		X						

Tab. 2. Main fauna taxa in the archaeological levels of Abric Romaní (Vallverdú et al. 2014)

Fig. 9. Lithic industry at Abric Romaní. A. Chert retouched objects (denticulate tools); B. Pseudo-Levallois lithic flake in limestone; C. Bifacial centripetal cores (discoid and Levallois) in chert; D. Flake and laminar flake in chert; E. Lithic refits in chert, quartz and limestone (Vallverdú et al. 2014).

Fig. 10. Examples of faunal remains from different levels of the Abric Romaní site: a. Mandibular specimens of Cervus elaphus, b. Mandibular specimens of Equus ferus. c. Specimens with anthropogenic and carnivore modifications (Photos/IPHES).

The sedimentary context of the Abric Romaní characterized by the dominance of travertine formation dynamics provide that the tufa deposits cover most of the archaeological levels and allow the very good preservation of all remains but specially some exceptional as wood imprints and hearths.
Wood remains have been identified in all of the levels excavated in the large surface excavation (from H to Q). Its use for various activities being documented: (1) as fuel, the wood imprints are documented as charred firewood on the combustion structures or as accumulated reserves; (2) as structural element to organized the occupied surface (Fig. 11); (3) as wooden objects and for tools. This has made it possible to document the use of wood by Neanderthals, both as fuel and raw material for artefact manufacture (Carbonell and Castro-Curel, 1992; Castro-Curel and Carbonell, 1995; Solé et al., 2013, Allué et al. 2017).
The preservation of numerous hearths has been used as a proxy in the recognition of activity areas, along with the spatial distribution of the lithic artifacts and faunal remains. Hearths played a central role in spatial organization, as most activities were carried out around them. This gave rise to a spatial pattern characterized by well-defined hearth-related accumulations, which were confirmed by faunal and lithic refits (Gabucio et al. 2017, Vallverdú et al. 2005, 2010, 2012a, 2014, Vaquero & Pastó 2001, Vaquero et al. 2004, 2007, 2012, 2015). The spatial documentation of the combustion strucutres of the Abric Romaní supports the argument that the Neanderthals used fire for different purposes. The inventory of hearths are around 200 and they shows different construction techniques. The most common combustion structures (>80%) are flat and without stones. There are also flat combustion structures with stones; within concavities with carved tails; in small pits with burned stones and sediments; in re-excavated holes. Many of these combustion structures could be related with special fire use activity areas (Carbonell eta l. 2007, Vallverdú et al 2012b).

Fig. 11. A. Wood imprint from level N (Photo/IPHES - Vallverdú et al. 2014); B. Carbonized wood from level P; C-D. Examples of combustion structures from level M (left) and P (right) (Photos IPHES).

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Saturday, April 7th, 2018 Excursion B: (probably 8:30 – ca. 17:00)

Abric dels Rossegadors - Ulldecona - Museo de Amposta

Menéndez, B., Viñas, R., Rivals, F.

Levantine Art

In 1998, UNESCO declared the group of Rock Art of the Mediterranean Basin as a "Heritage of Cultural Interest" belonging to the World Heritage. It is a set of more than a thousand sites with paintings and engravings. They are located on the Mediterranean coast of the Iberian Peninsula (Aragon, Catalonia, Valencia, Murcia, Castilla La Mancha and Andalucia). However, in other localities of the Iberian Peninsula there is also rock art with Levantine characteristics. The most outstanding Levantine sites are the Abrigo de Cogull (Lleida), the Barranco des Gascons (Teruel), the Cova dels Cavalls in the Valltorta (Castellón), the Cueva de la Araña in Bicorp (Valencia) and the Abrigo de Cantos de la Visera in Yecla (Murcia).
The Levantine sites are located at altitudes between 300 and 1000 meters above sea level. The shelters are facing south and they have a strategic position, close to water sources, open areas where it is possible to control a large territory, or close to hunting sites.
The Levantine Art is mainly composed of paintings. There are a small range of colors of red, black and white colors, together with brown, orange, purple and bluish tones. These colors were obtained from different minerals. The representations are usually monochrome, but in some cases the profile of the figures is in one color and the interior in another. The profiles were made with fine instruments such as feathers, branches or by incision, and then the painters filled the inside. Many figures show repaints, retouches or additions of different tonality that transform the original image. The engravings are less frequent. In recent years, new sets of engravings have been documented in Teruel, Castellón and Tarragona. The technique of engraving is very old. For some authors, these recorded events appear as a link with the end of the Paleolithic tradition.
The theme of the Levantine art is characterized by including the human figure as an important element. Also scenes of groups of hunters are observed, for example drives for deer, goats, bulls and wild boar. War scenes, executions or scenes of social and ritual character are also found. Female representations are also present in compositions. The figures, in many occasions, wear clothes (pants, dresses, skirts, headdresses...) and elements of the activities they represent (bows, arrows, quivers...). Other elements represented are plants and abstract motifs. The size of the representations varies between 5 and 25 cm, with some exceptions reach half a meter or more.
The chrono-cultural affiliation is a question still in debate, due to the inexistence of portable art comparable with Levantine painting and the lack of direct or indirect dating. There were two chrono-cultural interpretations proposed. On the one hand, the theory of H. Breuil, supported by H. Obermaier (Fig. 12 and 13), Bosh Gimpera and Pericot, which, based on the representations of the Minateda site, placed this art within a Perigordian chronology (27,000-20,000 BC), with subsequent Magdalenian influence (15,000-9,000 BC).
On the other hand, researchers such as M. Pallarés, A. Duran, J. Cabré, E. Hernández Pacheco, M. Santa-Olalla, among others, proposed that it was a Neolithic art, due to the absence of representations of fauna of cold climate. This theory was supported by the archaeological context known at the time. Later, they were placed in postpalaeolithic stages, between the Epipalaeolithic and the Mesolithic, lasting until the arrival of agricultural and metallurgical cultures. E. Ripoll and A. Beltrán joined this postpalaeolithic theory and systematized. In the 70s, the process of Levantine Art was organized in four theoretical phases: Naturalist (Epipalaeolithic), Static stylized, Dynamic stylized and Transition to the schematic facies.
Currently there are three chronological proposals for the origin of the Levantine art. The first proposal considers an origin from the Final-Palaeolithic/Epipalaeolithic to thee Mesolithic (from 9.000-8.000 to 5.500 a.C.). The second proposal rises an origin to the Neolithic (5.500-3.000 a.C.). The third proposal is a combination of the two anterior, a Final-Palaeolithic to Neolithic origin (3.000 a.C.).

Fig. 12. H. Breuil and H. Obermaier in the rock shelter of Cova Remigia (Catellón) in 1935.

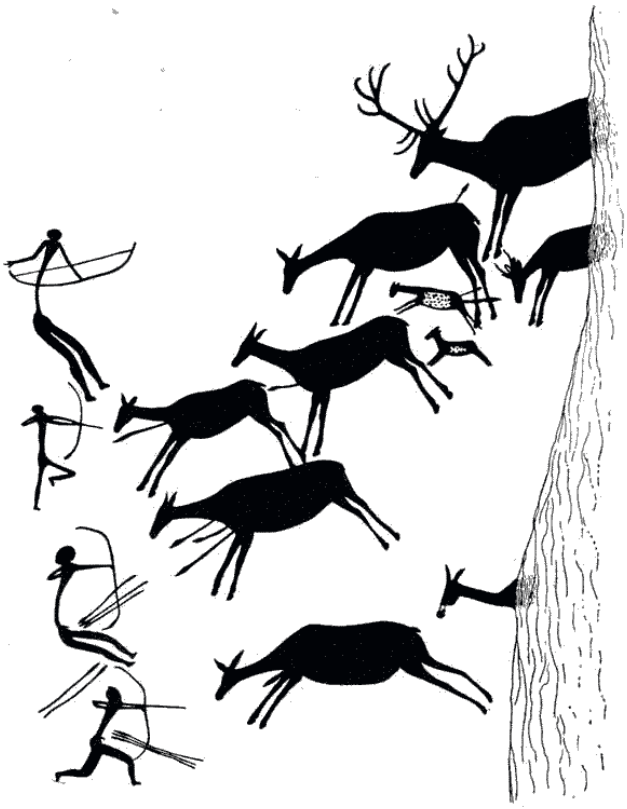

Fig. 13. Drawing of deer hunting made by H. Obermaier in the Valltorta (Cueva de los Caballos, Tirig, Castellón). These drawing and others were published by Obermaier and Wernert in the work „Las pinturas rupestres del Barranco de La Valltorta (Castellón)". In 1919. Author: H. Obermaier.

Abric dels Rossegadors

The rock art of the Abric dels Rossegadors (the Rossegadors Cave), also known as Polvorín, is located in the municipality of La Pobla de Benifassà (Baix Maestrat region), about 7 km north of the town of La Sènia (Tarragona). It is located within the Massif of the Ports de Tortosa-Beseit. This point is a natural step between the Prelitoral Sierra and the Iberian System. The shelter is formed by grey and white Mesozoic limestone. It is located within an exceptional environment, on the side of a meander of the "second ravine" tributary of the Sènia River and at 450 meters above sea level. Its orientation is E-SE and its dimensions are about 25 m in length and between 3 and 8 m in height.

Its discovery was due to the construction of the Ulldecona water reservoir in the 1940s. This rock shelter was chosen to build a storage room for the explosive materials used during the construction. The rock paintings were identified in the autumn of 1947, and the following spring Salvador Vilaseca (Catalan historian and doctor) visited the place. He made the first photographs and tracings of the whole complex. He returned on several occasions, subsidized by the General Commissariat of Archaeological Excavations, but the full study was never published. In that same year, Juan Cañigueral published an article in the journal *Ibérica* describing the painted panel, which he placed in the last stages of the Palaeolithic. In later years, the paintings of the Cova dels Rossegadors were cited by other authors such as A. Beltrán in *Arte Levantino* (1968) and Norberto Mesado (1989), and with some paintings not published by Vilaseca.

The set is composed of eight panels. The painted motifs have been affected by runoff, stalagmite washes and layers of calcium carbonate that cover a certain number of representations. Anthropic deterioration is also present and is observed in some figures that have been mutilated or scratched on purpose. Even though, the general state of conservation is acceptable compared to other rock assemblages. For years the shelter remained closed to visits, which allowed preventing its deterioration.

Compositions and scenes

There are 211 figures represented in the Cova dels Rossegadors. However, taking into account that some paintings group more than one figure, the total number of motifs represent about 240 graphic units. Different groups have been differentiated along the wall, which have been distributed in 8 panels. Most of the figures are visible at first sight, although some images are fragmented and isolated (Figs. 14, 15, 16).

The first panels that we found is panel I, located close to the current entrance and successively the rest of the panels are along the shelter. The last two panels, VII and VIII, are located in the area which was strongly affected by the construction of the explosives shed. The representations show human figures, archers of different typology with or without clothing and animals, mainly caprids and cervids. These refer to hunting activities. There are also female human figures dressed in long skirts and of different sizes that give a sense of perspective (panel III).

Panel V is the one that contains the highest number of representations, both at the level of types as well as scenes and themes, which seems to be a hunting or a ritual. In this panel we can see a group of archers of different types, several of them in the position of using arrows, as well as a woman with a stylized body and a skirt to the knee. Also, in this group stand out two impressive deer with a proportional and realistic anatomy. In the lower part of the same panel there is another scene featuring human figures, a fork-shaped outline, a possible hive and what could be two bees around a human figure, apparently lying on the ground. Two wild boars are also represented on the panel in a rather deteriorated state of conservation. The wild boars are followed by an archer in the race. Behind this scene, there are several remains of human figures and archers. A small group of personages with spherical representations in the hands is distinguished among the representations. These figures approach another personage seated and tied by the neck to a peg or a trunk with branches. This seems to be a ritual scene.

There is another shelter, the Cova dels Rossegadors II (the Rossegadors Cave II), located about 50 m away and 25 m above the level of this rock shelter. It is a place with imposing

views and for its location it is necessary to skirt the wall that protects the Cova dels Rossegadors and go up the ravine. The rock art is distributed in two panels of about 2 m in length and 75 cm in height. The figures are painted in reddish, brown, chestnut-reddish violet and blackish colours. The panels are affected by numerous chipping due to natural phenomena and damages due to the wild goats that frequent the shelter. At present, the Cova dels Rossegadors II is not open to the public.

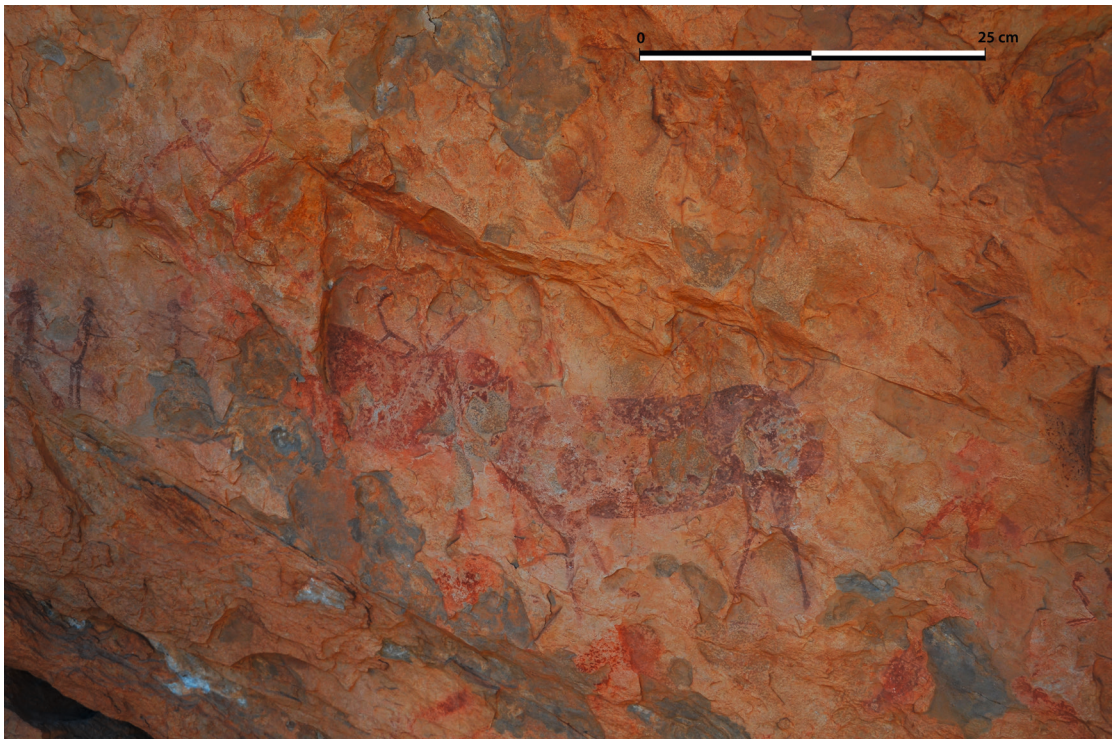

Fig. 14. Rock shelter of Els Rossegadors or Polvorin (Pobla de Benifassà, Tarragona). Photo original contrasted ready to work with the DStrecht plugin for Image J. Photo: F. Rivals. Contrasted: B. Menéndez.

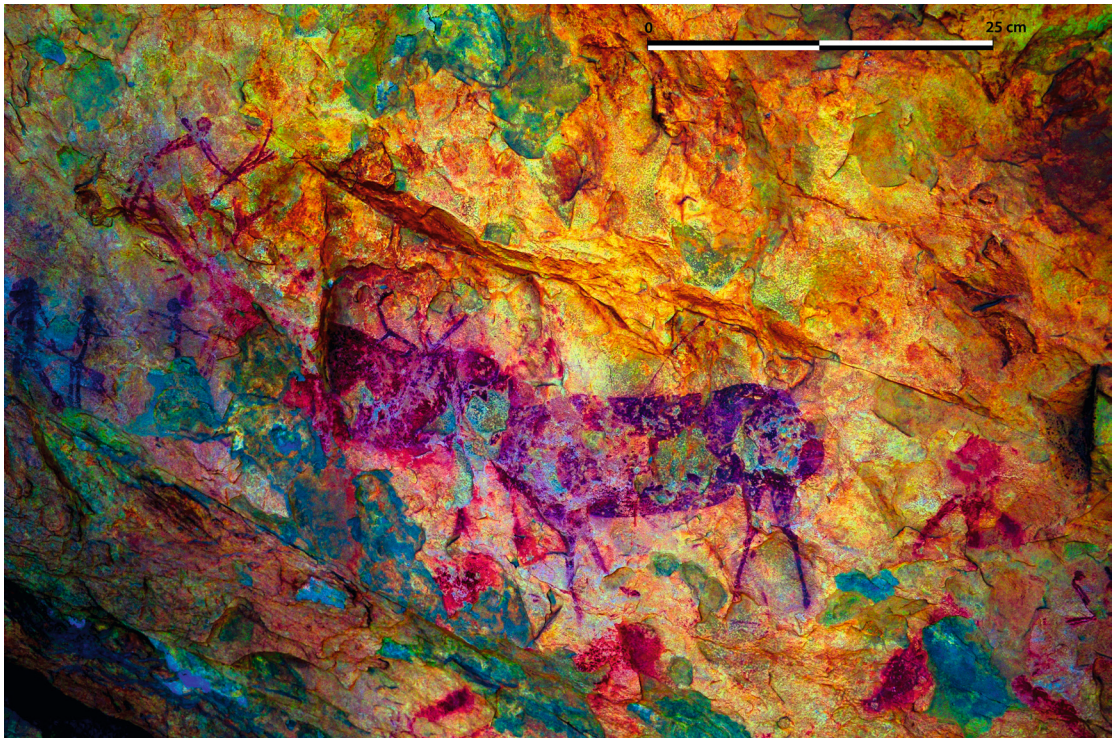

Fig. 15. Image with the DStrecht plugin for Image J with the LDS filter. Author: B. Menéndez.

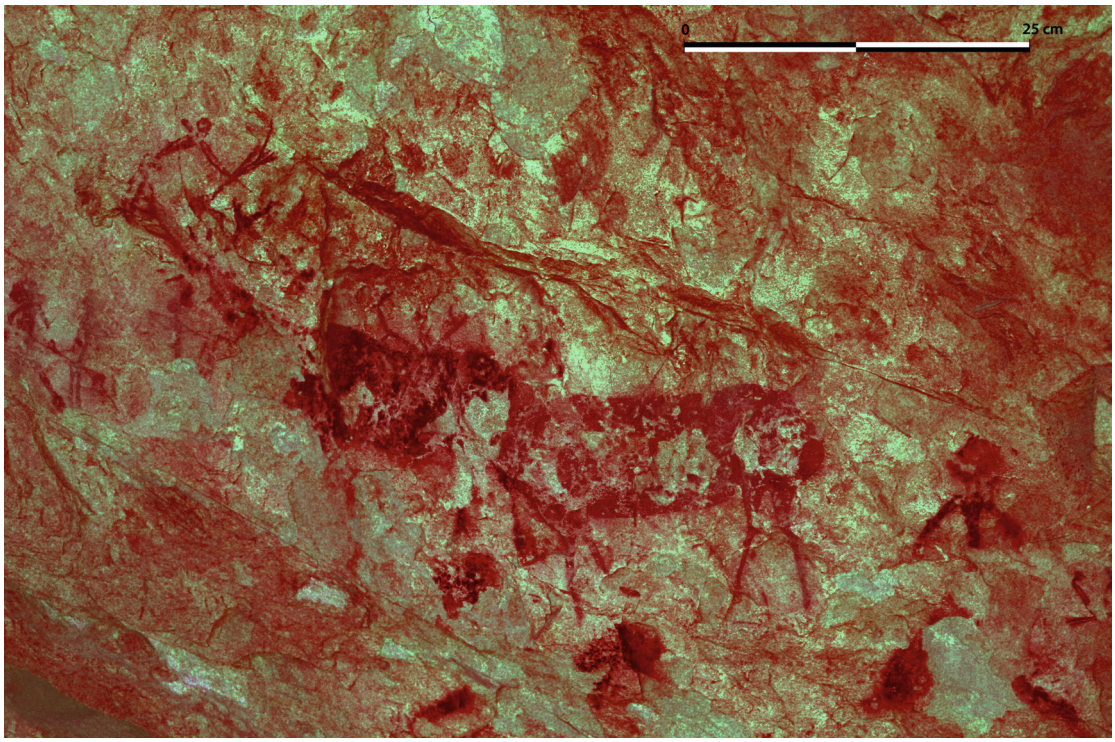

Fig. 16. Image with the DStrecht plugin for Image J with the YRE filter. Author: B. Menéndez.

The Abrics de l'Ermita and the Rock Art Interpretation Centre

The second visit of the tour is to the Rock Art Interpretation Centre and the Abrics of the Ermita in Ulldecona. The Interpretation Centre for Rock Art of the Abrics de l'Ermita (Ulldecona, Montsià) was created in 2005 by the Museu d'Arqueologia de Catalunya. The aim was to bring the Serra de Godall prehistoric paintings closer to the visitors. This set is located in the Ermita de la Pietat (the Piety Hermitage), next to the rock art shelters that compose the ensemble. The visit includes the Abric I and Abric IV that are open to the visitors. It is an exceptional site with rock art paintings belonging to the UNESCO World Heritage.

In 1975, a young speleologist discovered in a small cave the first figures of the rupestrian set of the Godall Mountain. At that time, a campaign of explorations started in the area and permitted the discovery of up to 14 shelters with rock art. At the moment, most of the paintings documented belong to the Levantine Art, except the Abrigo IV or Cova Fosca, where are some schematic-abstract figures.

The set of sites has 500 m in length and contains more than 400 figures distributed unevenly in the different shelters. The largest number of representations correspond to archers (111) and different animal species (82), while the rest are elements linked to hunting activity or indeterminate fragments.

Rock shelter I

The rock shelter I is located about 500 m from the Ermita de la Pietat. Compared to the others, it is of medium size (7 m in length, about 1.40 to 2 m deep, and a height of 1.5m). In this shelter, we found a well-preserved hunting scene. Originally, it seems that the paintings could cover almost all of the interior and top of the walls. Although most of them have disappeared, 170 figures are preserved (Fig. 17).

The paintings have a narrative and naturalistic style. The small figures are placed to form a hunting scene. Each hunter seems to occupy an important role within the composition, by beating or hunting a herd of deer and goats. The figures present a great anatomical and aesthetic detail, where it can be observed even hairstyles, clothing and simple and complex arcs.

Three figures that stand out among the representations. These figures are "El Brujo" (The Sorcerer, Fig. 18), "El Ciervo silueteado" (The Silhouetted deer) and the last is "La Mujer" (The Woman). These prehistoric representations, however, are considered "The oldest legend of Catalonia" because the characteristics of the figures and because it seems to have a clear narrative style.
Outside this panel, the rest of the wall and the support have worse preserved paintings. Some authors have been able to identify another woman and maybe a dog. Erosion elsewhere is so important, and it only allows to see irregular colour spots that cannot be determined.

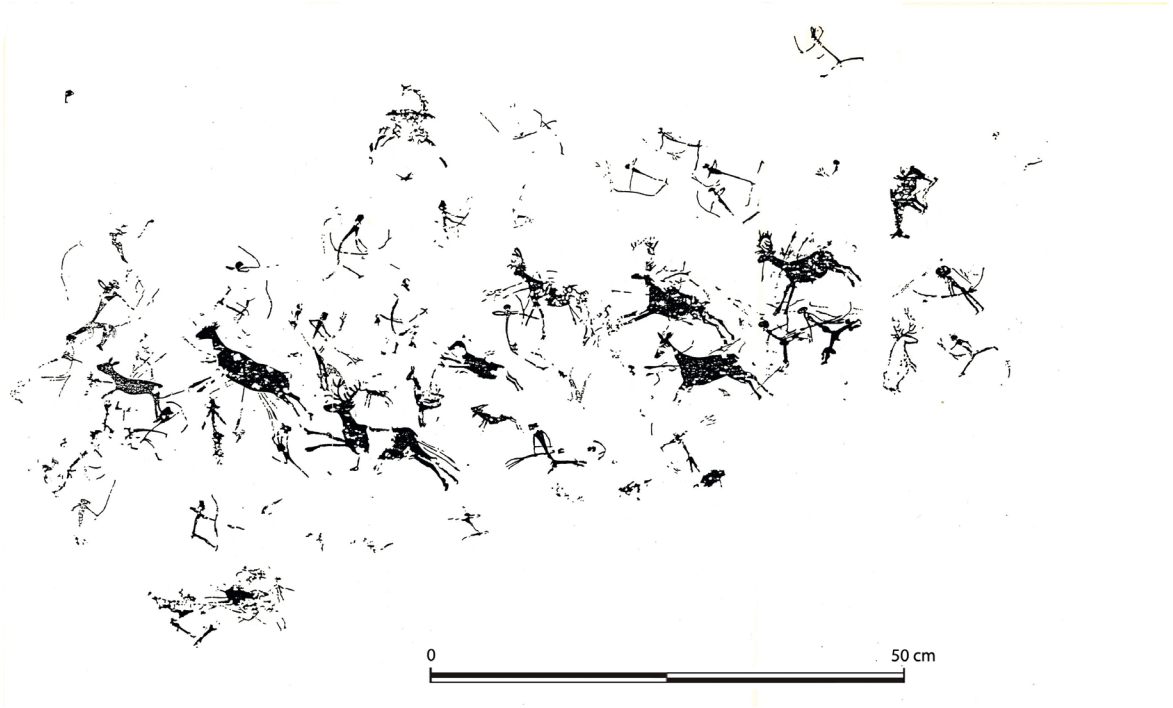

Fig. 17. Rock shelter I of the Ermita de la Pietat (Ulldecona). Digital tracing image of one scene. Author: R. Viñas.

Fig. 18. Motive from Rock shelter I, known as „The Sorcerer". Author: R. Viñas.

Rock shelter IV

The last of the shelters to visit is Rock shelter IV, also called Cova Fosca or Cueva Oscura (Dark Cave, Fig. 19). It is the largest shelter of the whole complex. Its name is given from its large dimensions (20 m long, 10 m deep and 8 m high) and because the cave has dark walls because, over time, shepherds and farmers lit fires inside, using it as a refuge. It is also known that during some festive traditions, these ended with the realization of fires in the shelter for a young man who spend the night inside. However, the most important problem in the conservation of the paintings is the large number of graffiti and engravings made during the 1990s. At this time, it is decided to close and protect the set of rock art.

The position of the shelter is central with respect to the whole complex and its access at the base of the cliff makes it a good refuge for both animals and people. Today, there is no sediment inside the shelter that could evidence the presence of human occupations during the prehistory. However, on the outside of the shelter, there is a small level of sediments where ceramic and flint were recovered. This suggests that the interior could also have contained these levels of sediment. The need for land to build nearby terraces could have caused the sediment not to be conserved inside.

The prospection and study works that were carried out in the 1970s and 1980s allowed to document paintings that have been lost or are practically disappeared now. The paintings are located on the two side walls of the shelter, 47 figures can be distinguished. They belong to different styles, some representations are clearly ascribed to the schematic-abstract and naturalistic-stylized style. In their moment, they were distinguished serpentiforms, zig-zags, caprids (Fig. 20), quadrupeds, braquiforms and the others were not identified. The meaning of many figures is enigmatic, but it is a necessary complement to understand the whole and its complexity, as well as its temporal evolution.

Fig. 19. Rock shelter IV or Cova Fosca (Dark Cave) of the Ermita de la Pietat (Ulldecona). Photo: J. Mestre.

Fig. 20. Representation of two naturalist-stylized goats in the Cova Fosca. Photo: J. Mestre.

The Terres de L'Ebre Museum (Amposta)

The Museum of "The Terres de L'Ebre" was inaugurated in 1984 in the modernist building of the old public school of Amposta. It is as a regional multidisciplinary museum focused on the conservation and dissemination of natural, archaeological and ethnological heritage of the Ebro delta.
The creation of this museum is based on the findings of the archaeologist Francesc Estevez and the Archaeological research group of Amposta. Estevez Gálvez was a disciple of P. Bosch Gimpa and Hugo Obermaier and developed his activity at the mouth of the Ebro River in the 1950s-1960s.
In 2011, the museum was renovated and increased its surface to 3,000 m2. These news facilities permitted to develop services and museum activities of territorial scope, to explore new possibilities of action as a space of creation and presentation of contents. At the same time, they are an important component to become a cultural platform for citizen initiatives and of projection of the territory.
In parallel, in 1993 was created the *Consorci* of the *Museu de Les Terres de l'Ebre*, of which belong the *Consell comarcal del Montsià* and to eight municipalities. Each one of them has patrimonial equipment, which is managed by the consistory itself and the museum. They are an example of joint management and territorial projection of the patrimonial assets.

The museum currently has two permanent exhibition halls at its headquarters:

- **The lands of the Ebro River, from Prehistory to the Middle Ages:**

The base of this exhibition is the archaeological materials from the old museum and the excavations carried out between 1984 and 2017. The exhibition presents how the human settlement was developed in the lands of the Ebro River from the Neolithic until the Middle Age, represented by the cultures of prehistoric, Iberian, Roman, Andalusian and Christian populations (Fig. 21). In this way, the characteristics of the economy, the society and the beliefs and rituals of each period are analysed by vestiges of different types (ceramics, ornamental, weapons, etc.).

Fig. 21. Roman archaeology in the archaeological exhibition hall of the Terres de l'Ebre Museum. Photo: MTE.

- **The Ebro River, a water road**

This exhibition aims to evoke the visitor's memory and fluvial culture, highlighting the great importance of the river Ebro in the history and in the configuration of collective identity. From five areas different visions of the Ebro valley are presented: the river that gives life, the river cradle, the river road, the captive river and the river today (Fig. 22). In summary, it is an exhibition of ethnological and natural content that exposes the role played by the Ebro River. At the same time, this exhibition analyses the social, economic, cultural consequences and environmental changes in relation to the territorial present and future.

Fig. 22. Barque exposed in the ethnographical exhibition hall of the Terres de l'Ebre Museum. Photo: MTE.

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Bericht zur 59. Tagung der Gesellschaft in Aurich vom 18.-22. April 2017

von
Thorsten Uthmeier und Andreas Maier

2017 hatte die Ostfriesische Landschaft zur 59. Jahrestagung der Gesellschaft nach Aurich eingeladen. Der inhaltliche Fokus der Vorträge lag in diesem Jahr mit dem Schwerpunktthema „Across Doggerland. Man and environment during the Late- and Postglacial in the southern North Sea region", auf der spät- und postglazialen Landschafts- und Kulturentwicklung in der Nordeuropäischen Tiefebene. Die Exkursionen führten zu archäologisch und geowissenschaftlich interessanten Plätzen, wie Pingos, den Fundstellen Assen und Tannenhausen, der Sandgrube Dietrichsfeld oder dem Drents Museum und dem Nordelijke Archeologisch Depot Nuis. Bereits an dieser Stelle gebührt allen, die sich an der Organisation der Tagung beteiligt haben, der besondere Dank der Gesellschaft, wobei Herr Dr. *Jan Kegler*, Frau Dr. *Sonja König* (Ostfriesische Landschaft), *Harald Kuiper* (Stadtrat Aurich), *Stefan de Jonge* (Energie- und Erlebnis Zentrum Aurich), *Axel Heinze* (Museum Leben, Esens am Meer), *Ernst Taayke* (Norderlijke Archeologisch Depot), Marcel Niekus (Uni Groningen) und *Vincent van Vilsteren* (Drenths Museum) für Ihren Einsatz vor Ort besonders hervorgehoben werden müssen. Ebenfalls bedankt sich die Gesellschaft für die tatkräftige Unterstützung bei *Wiebke Schoon*, *Mohammed Kier Alabdulrazzaq*, *Hilde Menken* und *Linda Mennenga (*Ostfriesische Landschaft).

Conference and Excursion*

1. The place of the 59th Annual Meeting: Aurich

The 59th Annual Meeting of the Hugo Obermaier Society took place from the 18th to the 22nd of April 2017 in Aurich, which is situated in Eastern Freesia, app. 25 kilometres from the shore of the Northern Sea. Today, Aurich is the central administrative city of the district with the same name. The historical traditions of Aurich go back to the 13th century, and in the more recent past it was the residence of Eastern Frisian aristocrats as well as the regional centre of the empires of Prussia and Hannover. The society was invited by the city of Aurich and, more important from an archaeological point of view, the Ostfriesische Landschaft (Fig. 1), which is the regional administrative unit responsible for public tasks including archaeology. The main driving force behind the invitation was Dr. J. Kegler, who wrote his PhD-thesis about Mas d´Azil and is now the head of the scientific section of the archaeological unit of the Ostfriesische Landschaft. The society was delighted by his offer, and is greatly thankful to him and his team for the organization of the successful conference.

2. Reports on the Middle Palaeolithic

After the welcome notes by R. Mecklenburg, president of the Ostfriesische Landschaft, Dr. J. Kegler as the representative of the archaeological branch of the Ostfriesische Landschaft and the president of the Society, Th. Uthmeier from the University of Erlangen, the first of the all in all highly interesting sessions started. The lectures of the first day were – with one exception – dedicated to Neanderthals and their lithic equipment.
After an introduction into a novel method for the molecular analysis of faunal as well as hominin remains by *F. Welker et al.* termed "ZoomMS", which has the potential to revolutionize archaeozoology as well as palaeoanthropology, the first talk about Middle Palaeolithic artefacts was held by *L. Schunk*, who analysed the operational chain of backed bifacial knives from the perspective of social learning and formal teaching, and *J. A. Frick*, who reported about new Micoquian sites in the Saône-et-Loire region near to Macon that include, among other features, typical backed bifacial knives (e.g. Keilmesser) and lateral sharpening flakes

*The text is an only marginally changed version of the same report originally published as Uthmeier, Th. (2017): The 59th Annual Meeting of the Hugo Obermaier Society in Aurich. Anthropologie LV3, 401-408.

Fig. 1. The lecture hall of the 59th annual meeting of the Hugo Obermaier Society in the building of the Ostfriesische Landschaft in Aurich 2017. Victor P. Chabai, Institute of Archaeology of the National Academy of Science of Ukraine during his lecture about the Micoquian in Eastern and Central Europe.

(sometimes referred as "Pradnik" technique). The topic of the talk of *M. Weiß et al.* was equally related to bifacial tools, but this time the focus was on the late Middle Palaeolithic or - depending on the classification scheme used - the transition from the Middle to the Upper Palaeolithic. He described a project that has just started and is dedicated to a re-evaluation of the last sediments left at the famous site of Ranis-Ilsenhöhle with a stratigraphical succession of the Lincombian-Ranisian-Jerzmanovician and an early Upper Palaeolithic industry often classified as Aurignacian. Of major interest is the exact stratigraphical position of the archaeological horizons with leaf points. Preliminary geo-physical prospections and first soundings helped to identify the area with an intact stratigraphy that will be excavated in 2017.
After the coffee break, *P. Neruda & Z. Nerudova* stimulated a very vivid and fruitful discussion about so-called leafpoint knives, which were recently defined for assemblages assigned to the Szeletian or Altmühlian. Refittings from Moravsky-Krumlov IV show that here, the back observed on some of the leaf points is in fact a remnant of surface shaping that originally was intended to be removed thinning, which failed. This important observation will certainly lead to an ongoing debate about leafpoint knives in the future. Assemblages of the Micoquian with typical bifacial knives now also occur in the Altai region, as *K. Kolobova & V. P. Chabai* reported. The recently discovered Chagyrskaya Cave has been systematically excavated by the Siberian Branch of the Russian Academy of Science and expands the distribution of the Micoquian far to the East. This is very well proven by large assemblages (the total of lithics so far accounts for 90,000 pieces), absolute dates, environmental studies and numerous Neanderthal remains. It followed a comparison of Micoquian assemblages from Eastern Europe one the one hand, and Central Europe on the other by *V. P. Chabai & Th. Uthmeier*. The analysis, which was conducted in the frames of a research grant by the Alexander von Humboldt Foundation, supports the hypothesis that general features are found in the Eastern and as well as in the Central European regions of the Micoquian. The similarities include plan-konvex/plan konvex surface shaping, Quina cores and Quina scrapers as well as Levallois centripetal cores. Other items such as grozaks, large handaxes and Keilmesser made on large flakes with a retouched back and ventral thinning opposite to the bifacial working edge (Bocksteinmesser *sensu strictu* as

observed in the type site), have a more restricted distribution a may indicate diversity within an overall striking uniformity. However, assemblages like Klausennische, Neumark-Nord 2/0, Lichtenberg and Königsause C show no differences to the Eastern Micoquian at all.

3. Talk of the awardee of the Research Grant of the Hugo Obermaier Society 2016

It followed the presentation of the results of research conducted by *O. Lyzun*, who was supported by the Research Grant 2016 of the Hugo Obermaier Society. He successfully searched for new sites and, parallel to this, investigated recently discovered ones that belong to the Epi-Gravettian. The focus of his ongoing PhD-dissertation project is on the raw material procurement strategies and the resulting typological variability of the lithic assemblages. The Research Grant of the Hugo Obermaier Society is a biannual funding of EUR 5,000 for young researchers who conduct projects that contribute to their MA- or PhD-thesis. Originally restricted to fieldwork, the call has been enlarged by laboratory analysis (e.g. raw material analysis, geophysical datation etc.). Further information can be found at **www.obermaier-gesellschaft.de/english/application.html**. The first day of the annual meeting in Aurich ended with the opening of the poster session. Like in the past years, authors of the posters have the possibility to publish these with a doi-number on NEPSPOS Poster Space (see **https://www.nespos.org/display/PublicPosterSpace/Home**). In the evening, the participants met for an evening reception at the Energie-, Bildungs und Erlebniszentrum (EEZ) in Aurich-Sandhorst with an exhibition illustrating the ecological consequences of the use of conventional energies opposed to the positive effects of novel energy production. The background is the fact that Aurich hosts one of the world leading producers of wind power stations.

4. Reports on the Transition from Middle to Upper Palaeolithic

The first session of the second day started with talks about the Transition from the Middle to the Early Upper Palaeolithic. The first synthetic results of a long-term project at the site of Grotte de la Verpillière were presented by *H. Floss & C. Hoyer*. In the small cave, the excavations unearthed a stratigraphy that encompasses archaeological horizons from the late Middle Palaeolithic (with backed bifacial knives), the Châtelperronian and the Auignacien. In combination with an intensive regional survey, this key site enables important diachronic insights into this highly debated period of the European Palaeolithic.
It followed an overview about the beginning of the Upper Palaeolithic in the Northern European plain by *D. Flas.* His lecture summarized many years of his successful research into the Lincombian-Ranisian-Jerzmanowician and Aurignacian. The latter industry was also the topic of *G. Bataille et al.*, who – like many authors before – criticized the universal value of the Western European chronology. In an innovative approach, they diachronically compared first-hand analysis of key sites from Eastern, Central, Southern and Southwestern Europa and concluded that any large-scale description of the Aurignacian must consider a strong regional variability, which can both be chronological and/or functional. Talks dedicated to the Aurignacian were completed by *T. Matthies* with a description of the first results of the analysis of faunal remains recovered in 1927 at the late Aurignacian site of Breitenbach. The fauna is dominated by mammoth and reindeer, but at the same time diverse.

5. Reports of the Special session: *"Across Doggerland. Man and environment during the Late- and Postglacial in the southern North Sea region"*

The lecture of *S. Krüger* about pollen analysis from basal peat cores opened the special session of this year´s annual meeting "Across Doggerland. Man and environment during the Late- and Postglacial in the southern North Sea region". The next talk by *M. F. Mortensen*, who was (together with P. Pettitt, F. Riede and P. Gibbard) one of four invited key-note speakers, was also dedicated to environmental studies, this time giving an overview over the Late glacial and early Holocene vegetational history. The more intense archaeological investigation of submerged sites in the Northern wadden sea as well as other European marine waters is mirrored by interdisciplinary projects which are conducted by several institutions. *M. Karle & F. Bittmann* reported about two projects in the German wadden sea, whereas *M. Segschneider*

presented the SPLASHCOS-viewer, which allows for an online-search of submerged sites. The talk of *L. W. S. W. Amreutz et al*. gave a fascinating insight into large-scale rescue archaeology projects in the context of sand extraction in the cause of the construction of an extension of the Rotterdam harbor and the detection of the beaches near to Den Haag. The range of Palaeolithic and Mesolithic finds stretches from stone implements, bones points, faunal remains and human fossils.

The next three speakers were also invited to give key note talks. *P. Pettitt* focused on the Upper Palaeolithic of Great Britain by presenting new results of excavations at Mother Grundy´s Parlour, Creswell Crags, the analysis of faunal remains from High Furlong, Poulton-le-Fflyd (the "Poulton Elk") and LA-ICP MS trace element analysis of artefacts from the "Long Blade" assemblage from the Seamer Site C. Afterwards, *P. Gibbard*, who contributed important research to the dating of the oldest human presence north of the large maintain ranges around the the Matyama-Brunhes boundary, gave a detailed overview over the Quaternary Evolution of the North Sea region and the English channel. Finally, *F. Riede*, the last invited key note speaker, informed the audience environmental factors in the Late Palaeolithic of Denmark. Comparing environmental and ethnographic data, it is well conceivable that population densities were very low until the Allerød, which largely influenced cultural continuity and discontinuity, for example between the Hamburgian culture and the Federmessergruppen.

Related topics will be investigated by a sub-project of a new, long-term Collaborative Research Centre "Scales of Transformation - Human-Environmental Interaction in Prehistoric and Archaic Societies" financed by the German Science Foundation at the University of Kiel, as *S. B. Grimm & B. Eriksen* reported. Their project will deal with the Final Palaeolithic colonization of the Baltic region and focus on strategies observed in familiar and unfamiliar, e.g. newly settled, landscapes. *D. Groß et al.* are also researches from the Collaborative Research Centre mentioned above. They will investigate social-environmental transformations of Foragers from the early to mid-Holocene by using local case studies in well investigated key regions such as Duvensee, Hohen Viecheln and Friesack.

One of the most instructive talks about environmental studies came from *A. Hüser*, who reported about pingo remains in East Frisia. These features were for a long time not recognized or accepted as such. Geoarchaeological fieldwork proved the existences of pingos, which develop in permafrost due to growing bodies of frozen underground water bodies. Thus, hills with heights up to 14 meters and more may develop in otherwise flat steppe environments. For glacial hunter-gatherer, such features are attractive peaks for hunting stands etc. However, pingos were certainly more important for site catchment during phases of warming when they started to collapse. The crater-shaped remnants of collapsed pingos offer in the inner part protection from wind chill, a sweet water lake with a more diverse (avi-)fauna and vegetation for resource acquisition, and waterlogged sediments that allow for the preparation of bone and fur for further processing. The observation that Mesolithic sites cluster along the crater-like remnants of former pingos confirms this.

In the following, *S. Mahlstedt* more intensively referred to the archaeological sites from the regional Mesolithic. On a broader topographical scale, she investigated the distribution Mesolithic of sites in Eastern Frisia and conducted a site catchment analysis by using GIS. It turns out that the land use patterns of the Eastern Frisian Mesolithic are characterized as being the hinterland of large river systems running to Doggerland, which contrasts with the site distribution further to the South where sites cluster along larger rivers. *H. Peeters* went back to the topic of rescue archaeology in the context of large scale extraction of sandy sediments from the Northern sea bottom. He reported in greater detail about the results of the Maasvlakte 2 – Yangtze Harbour project. Seismic mapping and core sampling revealed archaeological sites on Aeolian river dunes. As a second step, a controlled grap sampling of from a depth of 15 m below sea level was conducted and resulted in archaeological remains from a drowning landscape between 8,500 and 6,500 calBC. Surprisingly, despite the comparably short distances to the then sea shore, the faunal remains indicate the use if a broad range of inland environments, but only few indications of the use of marine resources. The attested burning of the reed zone at the end of the time frame, when the area was actually a coastal one, is seen as the result from the intention to better connect the camp sites with the sea shore. However, the inhabitants still make use of food plants rather than marine food. The lake Agassiz drainage and the Storegga tsunami event led to a final flooding of the Doggerland at app. 6,200 calBC.

The evening lecture of *J. Kegler* gave an interesting and detailed survey of the Palaeolithic and Mesolithic settlement of the southern part of the Northern Sea Coast, including the results of his excavations at Late Upper Palaeolithic sites in the region.

6. Reports on Mixed Topics

U. Böhner et al. summarized the results of past investigations of unworked wood and wooden artefacts, including the famous wooden spears, from the late Lower Palaeolithic bog site of Schöningen. New investigations show that most items show anthropogenic traces. A methodological topic was investigated by *I. Schmidt et al*., who improved the analysis of demographic changes in the central European Upper and Final Palaeolithic. More practical aspects were touched by *K. Kindermann & A. Pastoors*. They reported about the search for possible original entrances into the the Volp cave system that are not accessible today. The starting points were late Middle Palaeolithic settlements far from daylight without traces of fire deep inside the cave of Tuc d´Audoubert, and the Gravettian art in the "Galerie des Chouettes" at the end of Les Trois Frères. In the talk, different methods of geophysics were compared with the results of excavations and digital elevation models showing depressions as possible collapsed entrances.
F. Sauer reported about his research about the adequate walking speed used for the modelling movements of hunter gatherers in GIS. In general, it is generally agreed upon the fact that walking distances depend on the given landscape depended. Nevertheless, a number of different walking speeds are used, including those coming from military sources; the best choice seems to be a speed measured in experiments and showing the least energetic costs independent from the load. The different speeds result in large differences in the distances that can be walked within 1 to 4 hours. This is illustrated at the sites of Gönnersdorf and Andernach by calculating the biomass available for hunting in the radii modelled.
H. Parow-Souchon described part of her results of her PhD about the Upper Palaeolithic in the Wadi Sabra in Jordan. The data is coming from four sites with assemblages that chronologically spread from the Early Ahmarian to the Epi-Palaeolithic. Chronological analysis with a wide range of methods show a stable residential mobility adapted to patchy resources. The lecture of *O. Touzé* dealt with the Gravettian in North-Western Europe and the discussion about its genesis, which is explained either as an innovation in a center, followed by diffusion, or an origin in several regions. The sites of Maisières Canal, Ormesson-les Bossats and Station de l´Hermitage allow the reconstruction of an *in-situ* development of a regional technological tradition different from the early Gravettian, pointing to a genesis in different regions. *H. Floss et al.* also referred to the Gravettian when they reported about their new discoveries at the open-air site of Saint-Martin-sous-Montaigu with a topographical setting comparable to that of nearby Solutré. First test trenches show that the site can best be interpreted as a large kill- and butchering-site. The lecture of *M. Händel* was also dedicated to the Gravettian. He described and discussed the site formation processes at different sites in the Krems-Wachtberg area. The sequences at the ancient excavations of Krems-Hundssteig (HU 1893-1904) and Bayer´s excavations of Krems-Wachtberg (WA 1930), the novel excavations at the Hundssteig (HU 2000-2002 and HU 2014) and the extensive excavations at Krems-Wachtberg (WA 2005-2015) with the infant burials all show *in-situ* layers from the Early Gravettian. The older archaeological horizons show a pedogenesis, whereas the younger ones are embedded in pure loess. Other horizons are clear palimpsests evoked by periglacial and slope processes. Two thin layers of organic ash dating to app. 31,000 calBP mark the end of both the Palaeolithic settlement activities and post-depositional According to recent radiocarbon dates, the archaeological horizon with the famous burials from Sungir, which were the topic of the talk of *T. Soldatova*, date to the same period, e.g. the onset of the Gravettian. The site was excavated during 24 field seasons from 1957-2004. As far as ivory working is concerned, these make up 26 % of all items made from hard organic materials. Truncated ivory flakes have linear outlines and are supposed to be preforms for ivory beads. They are struck opportunistically from tusk fragments, exhausted cores or appropriate chunks with a striking platform.
P. Skrdla et al. described the results of salvage excavations at Mohelno. The excavated area is situated on the shore of an artificial lake and is accessible only during several days each year

when the sea level is lowered. The field campaigns documented two occupation phases. The one dating to the LGM yielded a flake based industry and small microliths from carinated cores. Two paved structures are interpreted as tents due to a barrier effect of the artefact distributions.
Somewhat later are the sites that were the topic of the talk of *T. Therberger et al*. They reviewed known Magdalenian and Hamburgian sites from the northern fringe of the German middle mountain range and gave new perspectives for a re-analysis of the already published sites.

Fig. 2. Participants of the 1rst day of excursions in the lecture hall of the Noordelijk Archeologisch Depot (NAD) in Nuis, where the archaeological finds from the provinces of Drenthe, Friesland and Groningen are hosted.

Parallel to this, they mentioned a potential new Magdalenian surface site. *M. Wild* gave an overview over first results of his ongoing PhD thesis about the Hamburgian bone and antler industry. He analyzed original material from Poggenwisch and Slotseng. The results were compared to the Havelte phase of the Hamburgian culture and the final Magdalenian. Lithic objects of the Final Palaeolithic were investigated by *D. Stefanski* in the frames of his talk about the arch-backed and tanged point settlement in the Karów region. Due to surrounding mountainous regions, settlements and migrations are concentrated in the Vistula valley. With data available from literature, he analysed the periods under question for their chronology, settlement pattern, raw material procurement and lithic production, enriched by environmental proxy data from core drillings and pollen analysis. It becomes clear that
Sites with arch-backed points occur in small numbers only and represent the sporadic presence of hunter-gatherer groups. To the contrary, sites with tanged points are numerous and belong to the Swiderian. Recent absolute dates underline the possibility of a persistency of the Swiderian until the Boreal.
S. Harz et al. re-evaluated the famous wooden arrow remains from the Ahrensburgian layer of A. Rust´s excavations at Stellmoor. The objects consist of a shaft and a foreshaft from pine, which were connected by a typical construction termed "dovetail ". It is the oldest direct evidence for bow and arrow; however, the finds published so far were destroyed during World War II. In 2013, eleven pieces from Rust´s personal collection became accessible for analysis. Absolute dating by AMS were made difficult by preservatives used during the original conservation process, as infrared spectrometry and biomolecular analysis showed. Finally, the extraction of alpha-cellulose led to dates in the range of the faunal dates from the same layer and confirmed the authenticity of the artefacts.
The lecture of *M. Baales et al*. was about residue analysis of a Final Palaeolithic barbed point from Bergkamen-Oberaden in Westphalia. Radiocarbon dates gave an age of 11 kyr calBC within the time scale of the Allerød. At the base, the point was fixed with an adhesive material to a shaft. The adhesive material was identified as bee wax mixes with charcoal, which has only rarely been found at archaeological sites, but has proven its reliability in numerous experiments. At the moment, it is the earliest prove for the presence of honeybee in Central Europe.
J. Orschiedt et al. summarized 10 years of research in the Blätterhöhle near to Hagen, where they have unearthed early Mesolithic and late Neolithic burials. The dead were transported into the narrow shaft of the cave. Intensive research of the skeletons gave interesting insights into the nutrition as well as the genetic context of the buried as revealed by DNA analysis. In front of the cave, extensive excavations were dedicated to a long stratigraphical sequence that covers the entire Mesolithic. The latter includes – for the first time – a succession of several horizons of the Rhine-Meuse-Schelde group. It is well possible that the stratigraphy also covers the Final Palaeolithic, after some typical lithics were excavated at the base of the trench; the total depth until bedrock is unknown.
Finally, *M. Nadler* discussed the many factors that contributed to the Holocene paleo-relief observed in excavations in Middle Franconia, and *D. Groß et al*. reported first results of their re-valuation of the dating of the Mesolithic site of Hohen Viecheln 1. The consideration of the excavator that the site dates to the early Mesolithic were criticized soon after the initial publication. The authors confirmed that the setting of the site at a lakeshore complicated the reconstruction of the site formation processes.
The scientific program of the annual meeting ended with two days of excursion, which led the participants to the northern Netherlands, where they visited the Drents museum, the Noordelijk Archeologisch Depot (NAD) in Nuis (Fig. 2) as well as the Middle Palaeolithic MtA-site near Assen (Fig. 3). One of the highlights of the second day were the pingo remnants still visible at Wrokmoor (Fig. 4).
In sum, the 59th annual meeting in Aurich was successful in many ways. First, it brought together colleagues from entire Europe for several days of intense scientific exchange and discussions in the lecture hall as well as during the times spent together after the official program. Second, the society wanted to bring the north-western part of Central Europe into focus, and attract scientists from this region, including Scandinavia, Great Britain and the Netherlands. These accomplishments are certainly a major success.

Fig. 3. Marcel Niekus (in green jacket and rucksack on the left) at the site rich in hand axes of the Mousterian of Acheulian tradition near to Assen. Surface collections and first excavations resulted in a large assemblage with numerous refittings (see M. Niekus et al. 2011 in Quartär 58, 67-92).

Fig. 4. Still visible remnant of a collapsed pingo at Wrokmoor. The higher vegetation in the middle part of the photo consist, among others, of reed, indicating active bog conditions. The still preserved crater-like wall is visible in the background (especially to the left) and indicates the typical topographical position of Mesolithic sites in the region. The active pingo would have covered the entire area of the picture.

Mitgliederversammlung

Am Donnerstagnachmittag eröffnete der Präsident der Gesellschaft die Hauptversammlung und verlas anschließend den Jahresbericht des Geschäftsjahres 2016. Die Gesellschaft hatte vor Beginn der Tagung 247 persönliche und institutionelle Mitglieder, wobei 5 Austritte und 7 Neueintritte zu verzeichnen waren.

Der Kassenbericht für das Rechnungsjahr 2016 wurde durch die Schatzmeisterin Frau Dr. M.-J. Weber vorgetragen. Er enthielt einen detaillierten Bericht über Einnahmen, Ausgaben und Saldo des Geschäftsjahres zum 31.12.16 sowie zum aktuellen Stand, die Mitteilung über Ausgaben und Einnahmen der Tagung 2016 in Budapest sowie den Hinweis auf die Möglichkeit der Einsichtnahme. Anschließend verlas Frau Maria Knipping den Bericht über die Kassenprüfung durch Mitglied Herr Matthias Elbert. Die Schatzmeisterin wurde auf Antrag aus dem Saal einstimmig entlastet. Herr Uthmeier sprach im Namen der Gesellschaft Herrn Elbert den Dank für die Tätigkeit als Kassenprüfer aus. Als Kassenprüfer für das neue Geschäftsjahr wurde erneut Herr Matthias Elbert bestellt.

Werner Müller berichtete im Namen des Herausgebergremiums des Jahrbuchs Quartär über den zu diesem Zeitpunkt im Druck befindlichen Band 63 (2015). Die Erhöhung der Herausgeberzahl wirkt sich positiv auf die Arbeitsbelastung der einzelnen Herausgeber aus und wird begrüßt. Ebenfalls trug zur Entlastung bei, dass Frau Nicole Bößl, Grafikerin am Institut für Ur- und Frühgeschichte der Universität Erlangen-Nürnberg den Satz der Hälfte des Bandes übernommen hat. In Zukunft soll Frau Bößl den Satz vollständig übernehmen. Der scheidenden Herausgeberin Berit V. Eriksen wurde für ihr 9-jähriges Engagement gedankt. An ihrer Stelle wird dankenswerterweise Yvonne Tafelmaier die Aufgabe übernehmen. Ebenfalls aus dem Herausgeberteam scheidet Werner Müller aus, dem für seinen besonderen Einsatz während der letzten 9 Jahre für das Jahrbuch mit einem Gutschein für Angelzubehör gedankt wurde. Seine Aufgaben werden in Zukunft von Thorsten Uthmeier und Andreas Pastoors übernommen.

Zur Finanzierung des Förderpreises sollen zukünftig ca. 2500 € pro Jahr bei der Produktion von Quartär gespart werden. Darunter soll die Qualität jedoch nicht leiden. Hierzu soll der bestehende Vertag mit B. Wiegel zum Ende des Jahres 2018 gekündigt werden. Stattdessen soll es eine online-Version mit Open Access und Early View geben. Ab 200 Druckseiten erfolgt die Drucklegung in Eigenregie. Bei der nächsten Mitgliederversammlung wird der Vorstand hierfür verschiedene Modelle zur Diskussion stellen.

Die Gesellschaft dankt M. Gema Chacón und Florent Rivals (IPHES Tarragona) für die Einladung der Gesellschaft zur 60. Jahrestagung. Die Tagung wird vom 03. bis 07. April 2018 in Tarragona, Spanien stattfinden.

Mitglied Inge Hohenester beantragte die Entlastung des Vorstandes, die mit 22 Ja-Stimmen und 7 Enthaltungen angenommen wurde. Der Vorstand trat daraufhin zurück.
Nach Rücktritt des alten Vorstandes wurde Herr Werner Müller, der nicht mehr für den Vorstand kandidierte, mit der Wahl eines neuen Vorstandes beauftragt. Herr Müller leitete die Sitzung während der Wahl.
Als Präsident wurde gewählt:
Prof. Dr. Thorsten Uthmeier (einstimmig mit einer Enthaltung). Herr Uthmeier nahm die Wahl an.
Als Vize-Präsident wurde gewählt:
Prof. Dr. Harald Floss (einstimmig mit einer Enthaltung). Herr Floss nahm die Wahl an.
Als Schriftführer wurde gewählt:
Dr. Andreas Maier (einstimmig mit einer Enthaltung). Herr Maier nahm die Wahl an.
Als Schatzmeisterin wurde gewählt:
Dr. Mara-Julia Weber (einstimmig mit einer Enthaltung). Frau Weber nahm die Wahl an.
Als Beisitzer wurden gewählt:
Prof. Dr. Michael Baales (einstimmig mit einer Enthaltung). Herr Baales nahm die Wahl an.

Dr. Walpurga Antl-Weiser (einstimmig mit einer Enthaltung). Frau Antl-Weiser nahm die Wahl an.

Als Beirat wurde einstimmig mit einer Enthaltung gewählt:
Dr. Doris Döppes
Prof. Nicholas Conard Ph.D.
Prof. Dr. Jürgen Richter
Dr. Andreas Pastoors
Dr. Elaine Turner
Prof. Dr. Gerd-Christian Weniger
Dr. Zdeňka Nerudova

Der Förderpreis wird für das Jahr 2018 wieder ausgeschrieben mit einer Erweiterung für Arbeiten aus dem Bereich der Quartärgeologie.

Nach dem Dank an alle Beteiligten schloss die Mitgliederversammlung um 19:45 Uhr.

✉ *Thorsten Uthmeier, Andreas Maier, Hugo Obermaier-Gesellschaft c/o Institut für Ur- und Frühgeschichte, Universität Erlangen, Kochstr. 4/18, 91054 Erlangen, Germany*

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