MORAVSKÉ ZEMSKÉ MUZEUM

HUGO OBERMAIER-SOCIETY
MORAVSKÉ ZEMSKÉ MUZEUM

BACK TO THE GRAVETTIAN

62ND CONFERENCE OF THE HUGO OBERMAIER-SOCIETY
APRIL 6TH–8TH 2021, BRNO
ONLINE CONFERENCE

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Hugo Obermaier Society

for Quaternary Research and Archaeology of the Stone Age

62nd Annual Meeting in Brno

ONLINE CONFERENCE

April 6th – April 8th 2021

In cooperation with

MORAVIAN MUSEUM

...linking the past with the future since 1817...

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Content *(Inhalt)*

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

62nd Annual Meeting
April 6th – 8th, 2021

At the Invitation of the Moravské zemské muzeum (Moravian Museum)

Tuesday, April 6th, 2021

Via Zoom

09:15	Opening of the conference and Welcome by our hosts, the General Director of the Moravian Museum, Dr. Jiří Mitáček, the director of the Historical Museum of the Moravian Museum, Dr. Marek Junek, and the president of the Hugo Obermaier Society, Prof. Thorsten Uthmeier
09:30 – 10:00	Awarding of the Hugo Obermaier Research Grant 2020 *Rodrigo Loyola* Searching for the early human occupations of the Late-Pleistocene dispersal into the highland of the southern Andes
10:00 – 17:40	Reports on mixed topics (*Lunch break 12:00-13:00; Coffee break 15:20-15:40*)

Via GatherTown

17:45 – 19:30	Poster-Session
19:30	Get-together and option for virtual excursion

Wednesday, April 7th, 2021

Via Zoom

09:00 – 13:00	Reports on the Early and Late Upper Palaeolithic (*Coffee break* 10:40 – 11:00)
13:00 – 14:00	Lunch break
14:00 – 19:00	Special Session: Back to the Gravettian (*Coffee break* 16:00 – 16:20)
19:15	Public evening lecture by Dr. Martin Oliva: From the Mesolithic to the Hallstatt Age: a large chert mining in the "Krumlov Forest" Area

Via GatherTown

20:15	Get-together

Thursday, April 8th, 2021

Via Zoom

09:00 – 13:00	Reports on the Middle Palaeolithic, Part I (*Coffee break* 10:40 – 11:00)
13:00 – 14:00	Lunch break
14:00 – 15:00	Reports on the Middle Palaeolithic, Part II
15:00 – 19:20	Site Reports (*Coffee break* 16:20 – 16:40)
19:30	Society's annual general meeting

Via GatherTown

19:30	Get-together, start parallel to the society's annual general meeting

Tuesday, April 6th

09:15 **Opening of the conference**
Opening of the conference and Welcome by our hosts, the General Director of the Moravian Museum, Dr. Jiří Mitáček, the director of the Historical Museum of the Moravian Museum, Dr. Marek Junek, and the president of the Hugo Obermaier Society, Prof. Thorsten Uthmeier

09:30 – 10:00 Awarding of the Hugo Obermaier Research Grant 2020
Rodrigo Loyola
Searching for the early human occupations of the Late-Pleistocene dispersal into the highland of the southern Andes

Reports on mixed topics

10:00 – 10:20 *Isabell Schmidt, Andreas Maier, Patrick Ludwig & Andreas Zimmermann*
Possible effects of changes in insolation on Upper Palaeolithic populations

10:20 – 10:40 *Andreas Pastoors, Thorsten Uthmeier & Robert Bégouën*
Episodes of Magdalenian Hunter-Gatherers in the Upper Gallery of Tuc d'Audoubert (Ariège, France)

10:40 – 11:00 *Benjamin Schürch, Sibylle Wolf, Patrick Schmidt & Nicholas J. Conard*
Glycymeris in the Aurignacian of Vogelherd and their implications for mobility and identity

11:00 – 11:20 *Gala García-Argudo, Antonio Rodríguez-Hidalgo, Palmira Saladié, Josep Vergès & Josep Fullola*
Upper Paleolithic personal ornaments from Serinyà Caves (Girona, NE Iberia)

11:20 – 11:40 *Liane Giemsch, Susanne C. Münzel & Ralf W. Schmitz*
Sexual symbol or domestic tool? The use of bear bacula – an assessment of the archaeological and ethnographical record

11:40 – 12:00 *Markus Wild, Birgit Gehlen & Martin Street*
Antler Headdresses. Implications from a many-faceted study of an earliest Mesolithic phenomenon

12:00 – 13:00 **Lunch break (60 Min.)**

13:00 – 13:20 *Florian Linsel*
The Petrification of the Fractal Dimension

13:20 – 13:40 *Florent Rivals, Rivka Rabinovich, Hamudi Khalaily, François Valla & Anne Bridault*
Ungulates paleodiet and seasonality in the Final Natufian assemblage from Eynan/Mallaha (Northern Jordan Valley, Israel)

13:40 – 14:00 *Hannah Parow-Souchon, Mirijam Zickel & Heiko Manner*
Palaeolithic sites and where to find them. A predictive modelling approach to assess site expectancy in the Southern Levant

14:00 – 14:20 *Christina-Maria Wiesner*
Settlement patterns of the Middle Palaeolithic in Southern Germany: A GIS-supported predictive model for sites in Bavaria and Baden-Wurttemberg

14:20 – 14:40 *Gerd-Christian Weniger, Viviane Bolin, María de Andrés-Herrero, Martin Kehl, Konstantin Klein, Taylor Otto, Miriam Rotgänger, Yaping Shao & Yvonne Tafelmaier*
Settlement patterns and land use in Iberia in the Late Pleistocene. Testing different approaches

14:40 – 15:00 *Jonathan Schoenenberg & Florian Sauer*
Over the Hills and Far Away – Modelling Habitat Diversity in Upper Palaeolithic Site Catchments

15:00 – 15:20 *Galina N. Poplevko & Ekaterina V. Doronicheva*
Functional variability of lithic tools from layer 2 at Psytuaje Rockshelter, North-central Caucasus, Russia

15:20 – 15:40 **Coffee break (20 Min.)**

15:40 – 16:00 *Yamandú H. Hilbert, Ignacio Clemente-Conte, Najat al-Fudhaili & Matthias López Correa*
Traceological analysis of backed points from the dry Plateau of Dhofar reveals insights into South Arabian Upper Paleolithic projectile technology

16:00 – 16:20 *Katarzyna Pyżewicz, Andrzej Wiśniewski, Kamil Serwatka, Malgorzata Kot, Witold Grużdż & Katarzyna Kerneder-Gubała*
On the form and function of Jerzmanowician leafpoints

16:20 – 16:40 *Flavia Venditti & Ran Barkai*
An overview on the use-wear and residue data from Layer C3 at the late Lower Paleolithic site of Revadim (Israel)

16:40 – 17:00 *Christian Waldenheim, Thomas Weber, Klaus-Dieter Meyer, Stefan Wansa & Tobias Lauer*
Lithics from the ice – a new Older Palaeolithic inventory from glacial sediments near Haldensleben, Saxony-Anhalt, Germany

17:00 – 17:20 *Tobias Lauer, Mareike C Stahlschmidt, Kirsty Penkman, Thomas Daniel, Susann Heinrich & Clemens Pasda*
The Lower Paleolithic site of Bilzingsleben – new insights into chronology and site formation

17:20 – 17:40 *Jordi Serangeli, Flavio Altamura, Ivo Verheijen, Bárbara Rodríguez Álvarez, Mario Tucci, Kim Krahn, Brigitte Urban, Jens Lehmann, Enrico Brühl & Nicholas J. Conard*
Update about the elephants of Schöningen

17:45 – 19:30 **Poster Session**

19:30 **Get-together and option for virtual excursion**

Wednesday, April 7th

Reports on the Early and Late Upper Palaeolithic

09:00 – 09:20 *Evgeny Rybin & Arina Khatsenovich*
Blade production in the context of Middle and Initial Upper Paleolithic interaction in eastern Central Asia

09:20 – 09:40 *Sarah Pederzani, Kate Britton, Vera Aldeias, Nicolas Bourgon, Helen Fewlass, Tobias Lauer, Shannon P. McPherron, Zeljko Rezek, Nikolay Sirakov, Geoffrey M. Smith, Rosen Spasov, N.-Han Tran, Tsenka Tsanova & Jean-Jacques Hublin*
Cold climatic conditions for Homo sapiens in the Initial Upper Palaeolithic – direct evidence from Bacho Kiro Cave, Bulgaria

09:40 – 10:00 *György Lengyel, Zsolt Mester, Kristóf Szegedi & Jarosław Wilczyński*
The archaeology of Istállóskő Cave, Bükk Mountains, Northeast Hungary

10:00 – 10:20 *Jacopo Gennai & Jürgen Richter*
Thinking outside of the taxonomic box

10:20 – 10:40 *Arina Khatsenovich & Evgeny Rybin*
Upper Paleolithic bladelet and microblade production in Mongolia

10:40 – 11:00 **Coffee break (20 Min.)**

11:00 – 11:20 *Liubov V. Golovanova, Ekaterina V. Doronicheva & Vladimir B. Doronichev*
Geometric microliths in the Epipalaeolithic in the North Caucasus

11:20 – 11:40 *Michał Przeździecki, Natalia Gryczewska, Witold Migal & Katarzyna Pyżewicz*
A Magdalenian campsite at Ćmielów in Southern Poland

11:40 – 12:00 *Susanne C. Münzel, Saskia Pfrengle, Chris Baumann, Claus-Joachim Kind & Gerd Albrecht*
The Magdalenian cave site Gnirshöhle (Engen, Hegau, SW-Germany) – the faunal record and the question of an early phase of wolf domestication

12:00 – 12:20 *Gillian L. Wong, Britt M. Starkovich, Dorothée G. Drucker & Nicholas J. Conard*
The Magdalenian in the Lone Valley of southwest Germany, a local reconstruction with new faunal data from Langmahdhalde

12:20 – 12:40 *Sebastian Pfeifer*
The osseous projectile technology of the Central European Late Upper Palaeolithic: Results and questions from a three-year research project

12:40 – 13:00 *Tobias Reuter*
Evaluating technological concepts in lithic production - New perspectives on the Federmesser-Gruppen in Northern Germany

13:00 – 14:00 **Lunch break (60 Min.)**

Special Session: Back to the Gravettian

14:00 – 14:20 *Manuel Alcaraz-Castaño, Javier J. Alcolea-González, María de Andrés-Herrero, Samuel Castillo-Jiménez, Gloria Cuenca-Bescós, Felipe Cuartero, Martin Kehl, José A. López-Sáez, Luis Luque, Sebastián Pérez-Díaz, Raquel Piqué, Mónica Ruiz-Alonso, Ignacio Triguero, Gerd-C. Weniger & José Yravedra*
In search of the Gravettian hunters of Central Iberia: the MIS 2 sequence of Peña Capón (Guadalajara, Spain) and its surrounding landscape

14:20 – 14:40 *Alejandro Prieto, Iñaki Yusta, David Álvarez-Alonso, Alvaro Arrizabalaga, Aitor Calvo & José Yravedra*
The role of quartzite in a Gravettian hunting post: geoarchaeological characterisation of raw material in the layer CO.B.6 from Coímbre Cave (Asturias, Spain)

14:40 – 15:00 *Aitor Calvo, Luís Gomes, Lars Anderson, Damien Flas & Marianne Deschamps*
Back to the Gravettian at Gatzarria cave (France): new insights from the comparative analysis of the lithic assemblages from old and new excavations

15:00 – 15:20 *Armando Falcucci & Marco Peresani*
Assessing the Gravettian evidence from Fumane Cave

15:20 – 15:40 *Marco Peresani, Davide Delpiano, Filippo Zangrossi, Arianna Cocilova & Gloria Cattabriga*
Researches at the Early Gravettian site of Piovesello in the Northern Apennines

15:40 – 16:00 *Petr Šída, Jaroslaw Wilczyński, György Lengyel, Przemysław Mroczek & Sandra Sázelová*
Gravettian settlement in Lubná, Bohemia

16:00 – 16:20 **Coffee break (20 Min.)**

16:20 – 16:40 *Norbert Buchinger, Michael Brandl, Thomas Einwögerer & Kerstin Pasda*
The lithic industry at Gösing-Setzergraben: New insights on the Early Gravettian in Lower Austria

16:40 – 17:00 *Zdeňka Nerudová & Petr Neruda*
Hošťálkovice II – a revival of the Gravettian site near Ostrava (Moravia, Czech Republic)

17:00 – 17:20 *Michaela Polanska & Martin Novak*
Middle Gravettian of Moravia, regionalization, chronology and behavioral complexity of Pavlovian groups

17:20 – 17:40 *Philip R. Nigst, Timothée Libois, Paul Haesaerts, Marjolein D. Bosch, Tansy Branscombe, Vasile Chirica & Pierre Noiret*
The Gravettian sequence of Mitoc-Malu Galben (Romania): New fieldwork between 2013 and 2016

17:40 – 18:00 *Liubov V. Golovanova, Vladimir B. Doronichev & Andrey G. Nedomolkin*
Beyond the Gravettian: The Late Upper Palaeolithic industry of the NW Caucasus during early MIS 2, from 30 to 20 ka ago

18:00 – 18:20 *Miriam Nývltová Fišáková, Mietje Germonpré & Martina Lázničková-Galetová*
Seasonality in the fossil large canids from Předmostí

18:20 – 18:40 *Dorothée G. Drucker & Carole Vercoutère*
Tracking mammoth ecology and origin in southwestern France during the Gravettian: isotopic case study of Grotte du Pape at Brassempouy (Landes, France)

18:40 – 19:00 *Hervé Bocherens, Dorothée G. Drucker, Hélène Rougier & Christoph Wißing*
Isotopic insights into human diet during the Gravettian across Europe

19:15 **Public evening lecture by Dr. Martin Oliva**
From the Mesolithic to the Hallstatt Age: a large chert mining in the "Krumlov Forest" Area

20:15 **Get-together**

Thursday, April 8th

Reports on the Middle Palaeolithic

09:00 – 09:20 *Mario Mata-González, Britt M. Starkovich, Mohsen Zeidi & Nicholas J. Conard*
Animal Exploitation during the Middle Paleolithic at Ghar-e Boof (Southern Zagros Mountains, Iran)

09:20 – 09:40 *Amal Al Kassem*
New insight into core reduction strategies of the Late Middle Palaeolithic of assemblage 6 (Yabroud Shelter I, Syria)

09:40 – 10:00 *Alena Kharevich, Vladimir Kharevich, Sergei Markin, Victor Chabai & Kseniya Kolobova*
The relationship between core and bifacial flaking in Chagyrskaya Cave assemblage (Altai Mountains): Experimental data

10:00 – 10:20 *Ekaterina V. Doronicheva, Liubov V. Golovanova, Vladimir B. Doronichev, Andrey G. Nedomolkin, Yuriy N. Spasovskiy, Tamara F. Tregub, Maksim A. Volkov, Anastasiya S. Korzinova, Vladimir A. Tselmovitch & Galina N. Poplevko*
New data on hominid adaptations in the Middle Paleolithic from Saradj-Chuko Grotto, North-central Caucasus, Russia

10:20 – 10:40 *Kseniya Kolobova, Vladimir Kharevich, Alena Shalagina, Pavel Chistyakov & Andrei Krivoshapkin*
New approaches to the study of Middle Paleolithic bone retouchers

10:40 – 11:00 **Coffee break (20 Min.)**

11:00 – 11:20 *Marko Banda & Ivor Karavanić*
Exploring a novelty in the Middle Palaeolithic of Croatia: the open-air site of Campanož, Istria County

11:20 – 11:40 *Małgorzata Kot, Katarzyna Pyżewicz, Damian Stefański & Paweł Valde-Nowak*
Truncated faceted technology in Ciemna cave, Polish Jura

11:40 – 12:00 *Petr Šída*
The current state of research on the Middle Paleolithic of Bohemia: an attempt at critical revision

12:00 – 12:20 *Nicholas J. Conard, Maïlys Richard & Britt M. Starkovich*
Ongoing excavations at Hohle Fels Cave in the Ach Valley offer new insights into the Middle Paleolithic of the Swabian Jura

12:20 – 12:40 *Elisa Luzi, Sara E. Rhodes & Nicholas J. Conard*
Paleoenvironmental and paleoclimatic context of the Middle Paleolithic occupations of Hohle Fels inferred from the small-mammal assemblages

12:40 – 13:00 *Yvonne Tafelmaier*
Analyses of late Middle Palaeolithic leafpoints from Southern Germany – design, production and function

13:00 – 14:00 **Lunch break (60 Min.)**

14:00 – 14:20 *Michael Hein, Marcel Weiss, Mareike Stahlschmidt, Susann Heinrich, Brigitte Urban, Mario Tucci, David Tanner, Thomas Terberger, Johannes Schmidt, Hans von Suchodoletz, Florian Klimscha & Tobias Lauer*
Living on the edge – Neanderthal presence in changing environments from MIS 5e to the MIS 5a/4 boundary at the northern limit of their habitat in Central Europe. Part I: Sedimentology and Dating

14:20 – 14:40 *Marcel Weiss, Michael Hein, Mareike Stahlschmidt, Susann Heinrich, Brigitte Urban, Mario Tucci, David Tanner, Thomas Terberger, Johannes Schmidt, Hans von Suchodoletz, Florian Klimscha & Tobias Lauer*
Living on the edge – Neanderthal presence in changing environments from MIS 5e to the MIS 5a/4 boundary at the northern limit of their habitat in Central Europe. Part II: Archaeology

14:40 – 15:00 *Marcel Weiss, Davide Delpiano & Thorsten Uthmeier*
From North to South, from the cave to the open: a diachronic 3D geometric-morphometric comparison of late Middle Paleolithic Keilmesser from Lichtenberg and Sesselfelsgrotte

Site Reports

15:00 – 15:20 *Svenja Schray & Harald Floss*
New investigations on the Palaeolithic cave site Teux-Blancs (Saône-et-Loire, France)

15:20 – 15:40 *Marcel Bradtmöller, Merlin Hattermann, Aitor Calvo, Joao Marreiros, Arantzazu Jindriska Pérez Fernández, Christoph Schmidt, Marcel El-Kassem & Felix Henselowsky*
The Middle- and Upper Paleolithic occupations at Feldberg "Steinacker"

15:40 – 16:00 *Guido Bataille & Nicholas J. Conard*
Lithic transformation during the late Aurignacian phase at Hohle Fels Cave – implications for technology, site function and land-use

16:00 – 16:20 *Marjolein D. Bosch, Stéphane Pirson, Freddy Damblon, Margarita Jambrina-Enríquez, Carolina Mallol, Walpurga Antl-Weiser & Philip R. Nigst*
New fieldwork at the open-air loess site Ollersdorf-Heidenberg, Austria

16:20 – 16:40 **Coffee break (20 Min.)**

16:40 – 17:00 *Katarína Kapustka, Matthew Walls, Karolína Pauknerová, Lenka Lisá, Lucie Juřičková, Ivo Světlík, Zdeňka Sůvová, Přemysl Bobek & Kristýna Hošková*
Kožený Zámek. Archaeological and Paleoecological Insight from a Late Paleolithic site in Kokořínsko, Central Bohemia

17:00 – 17:20 *Ondřej Mlejnek, Ladislav Nejman, Miriam Nývltová Fišáková, Petr Škrdla & Lenka Lisá*
Multidisciplinary research at Švédův stůl Cave in the Moravian Karst

17:20 – 17:40 *Rhiannon E. Stevens, Hazel Reade, Alexander Pryor, Kerry Sayle, Jennifer Tripp, Thomas Higham & Jiří Svoboda*
Human occupation of Central Europe during the Last Glacial Maximum: new evidence from the Epigravettian site of Stránská Skála IV

17:40 – 18:00 *Bibiana Hromadová, Adrián Nemergut, Laurent Klaric, Martina Moravcová Ábelová & Martin Vlačiky*
Upper Palaeolithic site complex near Moravany nad Váhom (Slovakia): old story, new challenges

18:00 – 18:20 *Pavlo Vasyliev, Andreas Maier, Ivan Khoptynets, Vitalij Tkach & Victor Chabai*
New multilevel site Myrohoshcha I at Volyn (Western Ukraine)

18:20 – 18:40 *Florian Sauer & Jonathan Schoenenberg*
Geospatial Analysis of Intrasite Distribution Patterns at the Early Ahmarian site of Al-Ansab 1, Jordan

18:40 – 19:00 *Firas Jabbour, Boris Gasparyan & Andrew W. Kandel*
Spotlight on AH IIId, the main Upper Paleolithic occupation of Aghitu-3 Cave, Armenia

19:00 – 19:20 *Michaela Ecker & David Morris*
The early Middle Stone Age excavations at Pniel 6, South Africa

19:30 **Get-together**

19:30 **Society's annual general assembly (parallel to the get-together)**

Poster presentation

Mixed topics

Ekaterina N. Bocharova, Pavel V. Chistyakov, Galina D. Pavlenok & Konstantin K. Pavlenok
The Question of Price and Accuracy: A Comparative Study of Several Methods for Producing Images of Lithic Artifacts

Antony Borel, Julie Marteau, Raphaël Deltombe, Philippe Moreau, György Lengyel & Zsolt Mester
WEAR 2.0_Hungary. Qualitative and quantitative analyses of surface alterations of stone tools: digital and physical reference collection for the characterization of manufacture, use and natural/accidental traces on stone raw materials from Hungary

Aitor Calvo, Unai Perales, Maite García-Rojas, Christian Normand & Alvaro Arrizabalaga
Sewing with stones. Use-wear analysis of Gravettian Noailles-type burins from Isturitz cave (Basque Country, southwestern France)

Miriam Rotgänger & Gerd-Christian Weniger
GIS-based settlement pattern analyses of Late Middle Paleolithic to Magdalenian sites on the Iberian Peninsula

Marcel Schemmel
The El-Wad points of Al-Ansab 1

Early and Late Upper Palaeolithic

Chris Baumann, Saskia Pfrengle, Susanne C. Münzel, Martyna Molak, Tatiana R. Feuerborn, Abagail Breidenstein, Ella Reiter, Gerd Albrecht, Claus-Joachim Kind, Christian Verjux, Charlotte Leduc, Nicholas J. Conard, Dorothée G. Drucker, Liane Giemsch, Olaf Thalmann, Hervé Bocherens & Verena J. Schuenemann
Feeding the wolves? A 'dietary' case study of large canids in the Magdalenian cave site Gnirshöhle (Hegau Jura, SW-Germany)

Eleonora Gargani, Britt Starkovich & Nicholas J. Conard
Technological analysis of Magdalenian bone needles from the occupation in the Swabian Jura

Saskia Pfrengle, Chris Baumann, Susanne C. Münzel, Martyna Molak, Tatiana R. Feuerborn, Abagail Breidenstein, Ella Reiter, Gerd Albrecht, Claus-Joachim Kind, Christian Verjux, Charlotte Leduc, Nicholas J. Conard, Dorothée G. Drucker, Liane Giemsch, Olaf Thalmann, Hervé Bocherens & Verena J. Schuenemann
Mitochondrial diversity and early stage of wolf domestication - The case study of Gnirshöhle (Hegau Jura, SW-Germany), a Magdalenian cave site

Middle Palaeolithic

Siah Beattie, Britt M. Starkovich & Nicholas J. Conard
Middle Palaeolithic Avian fauna from Hohle Fels, Germany and Neanderthal lifeways

Holger Dietl, Marcel Weiss & Tobias Lauer
A rare Middle Palaeolithic „Non-Silex"-Industry with Pebble Tools and Microlithic Artefacts from Bad Dürrenberg, Saxony-Anhalt

Phil Glauberman, Boris Gasparyan, Ellery Frahm, Keith Wilkinson, Jenni Sherriff, Dmitri Arakelyan, Samvel Nahapetyan & Daniel Adler
Middle Paleolithic technological organization and land use in Armenia, a preliminary synthesis

Elaine Turner & Petr Neruda
From the hunt to the cave: defining Neanderthal subsistence during the Middle Palaeolithic at Kůlna Cave (Moravia, Czech Republic)

Site Reports

Will Archer, Gregor Bader, Darya Presnyakova, Debra Colarossi, Mareike Stahlschmidt, Louisa Hutten & Antonietta Jerardino*
Excavations at Steenbokfontein South, West Coast, Western Cape, South Africa

Norbert Buchinger, Thomas Einwögerer, Marc Händel, Veronika Kaudela, Andreas Maier, Christoph Mayr, Kerstin Pasda, Lilian Reiss, Ulrich Simon, Theresa Stauber, Michael Brandl, Sebastian Pfeifer, Christian Stüwe & Bernd Zolitschka
Success, limits and failure of subsistence strategies in eastern Central Europe during the early Gravettian and the Last Glacial Maximum – objectives and first results

M. Gema Chacón, Hassan Aouraghe, María Soto, Juan Ignacio Morales, Carlos Tornero, Hamid Haddoumi, Antonio Rodríguez-Hidalgo, Palmira Saladié, Diego Lombao, Antoni Canals, Alfonso Benito-Calvo, Juan Marín, Isabel Exposito, Ethel Allué, Celia Díez-Canseco, Gala García-Argudo, Mohamed Souhir, Elena Moreno-Ribas, Raül Bartrolí, Mourad Farkouch, Lee Arnold, Martina Demuro, Mathieu Duval, Al Mahdi Aissa, Arturo de Lombera-Hermida, Sonja Tomasso, Aïcha Oujaa, Said Bengamra & Robert Sala-Ramos
Homo sapiens open-air occupations in Eastern Morocco (Jerada Province)

Diana Dudnyk
The new investigations of the Barmaky site in Northwestern Ukraine, 2018-2020 field campaigns

Gonzalo Linares Matás, Norman Fernández Ruiz, María Haber Uriarte, Mariano López Martínez, Antonio López Jiménez & Michael Walker
Sharing shelter: hyaenas and early humans in the late Early Pleistocene Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain)

Arantzazu Jindriska Pérez Fernández, Marcel Bradtmöller, Merlin Hattermann, Joao Marreiros, Christoph Schmidt, Marcel El-Kassem & Felix Henselowsky
Insights into multidisciplinary analyses of the Paleolithic open-air site Feldberg "Steinacker"

*Darya Presnyakova**
Variability in later Acheulean behaviour – a comparison of hominin landscape use at Elandsfontein and Cornelia

Yvonne Tafelmaier, Serafin Becerra, Julia Blumenröther, Lidia Cabello Ligero, Martin Kehl, José Ramos-Muñoz, Miriam Rotgänger, Eduardo Vijande-Vila & Gerd-Christian Weniger
Sima de las Palomas de Teba (Andalusia/ Spain) – new data on hunter-gatherer land use during the late Pleistocene of Southern Iberia

Michael Walker, Mathieu Duval, Rainer Grün, María Haber Uriarte, Antonio López Jiménez & Mariano López Martínez
New chronological constraints for the Lower Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain): preliminary ESR dating of the late Early Pleistocene fauna

Michael.Walker, María Haber Uriarte, Mariano López Martínez, Antonio.López Jiménez & Jon Ortega Rodrigáñez
Neanderthal cranial remains and elements of the axial skeleton from the Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

Michael Walker, María Haber Uriarte, Mariano López Martínez, Antonio.López Jiménez & Jon Ortega Rodrigáñez
Neanderthal post-cranial skeletal remains from the Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

**Abstract can be found - deviating from alphabetical order - at the end of the abstract section.*

Hugo Obermaier Research Grant 2020

Rodrigo Antonio Loyola Muñoz[1,2]
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Searching for the early human occupations of the Late-Pleistocene dispersal into the highlands of the Southern Andes

The highlands of the Andes mountain range have long been considered marginal areas for human settlement due to extreme weather conditions, steep terrain, low primary productivity and hypoxia. Based on this idea, it has been assumed that high altitude environments above 3800 masl were populated later in prehistory. In recent years this scenario has begun to change with the publication of new archaeological sites and reliable dates that account for a heterogeneous peopling process with different chronologies and modalities for each area. In some regions the human colonization occurred fast during the late Pleistocene, by groups that occupied the highlands in a recurrent basis throughout the annual cycle. In others, a more gradual process is observed while certain areas were only used as complementary environments by lowland groups, or even completely avoided.
South of the Andes plateau, in the highlands of the Atacama Desert (23-27 º S, 4000 to 4600 masl) several archaeological sites have been reported which refer mainly to large lithic scatters, stone structures and bone remains located in the margins of saline lakes and ravines. Among the lithic assemblages, stand out the "Fishtail" and "Tuina" projectile points, which have been widely recorded in Late-Pleistocene and Early Holocene sites throughout South America. The aims of this project is to know the mobility strategies, settlement patterns, technology and paleo-environmental conditions of the first hunter-gatherer groups of the Atacama highlands. In a broader perspective, it is intended to establish the chronology and modality of occupation of this area in the context of the early peopling of the Andes region. To meet these objectives, four archaeological sites will be excavated and studied by using an inter-disciplinary approach which combine several lines of evidence as: (1) Pollen and macro-vegetal remains; (2) Sedimentology; (3) radiocarbon dating; (4) stable isotopes; (5) techno-functional analysis of lithic and bone artifacts; (6) obsidian provenance; (7) spatial analysis (SIG); and (8) zoo-archaeology. This project form part of the doctoral research project “Hunter-gatherer social networks and lithic technologies in the highlands of the Atacama Desert”, carry on in the UMR 7055 “Préhistoire et Technologie”, Université Paris Nanterre (France).

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Abstracts of Reports and Posters

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In search of the Gravettian hunters of Central Iberia: the MIS 2 sequence of Peña Capón (Guadalajara, Spain) and its surrounding landscape

The Upper Palaeolithic human settlement in the interior lands of Iberia has been the object of intense research in the last years. Once thought to be limited to the Magdalenian, and hence related to climate ameliorations after the Last Glacial Maximum (26.5 – 19 ka BP), a relevant number of Solutrean occurrences have recently shown that humans were present at the Iberian hinterland also during the LGM, despite the potentially risky ecological niches of these territories.
However, besides the description of a Proto-Solutrean occupation at the Peña Capón rock shelter after data from an old excavation, to date there is no clear evidence of previous Initial Upper Paleolithic human occupations in the two large plateaus of the Iberian interior. Here we present unprecedented research aimed at defining the cultural, chronological and ecological traits of a putative Gravettian presence in Central Iberia.
The focus of this research has been at the southeastern foothills of the Central System mountain range, in the Guadalajara province (Spain). Here, the Peña Capón site, formed under a limestone shelter in a marginal and protected area of the Sorbe River valley (861 meters above sea level), has shown a stratigraphic layer radiocarbon dated to 26.1-25.4 ka cal BP, and thus within the timeframe of the Gravettian of Southwest Europe. Although the archaeological composition of this layer is still scarce due to the limited excavated surface (1 sq. meter), associated palaeoecological evidence, including pollen, micromammals and wood charcoal, points to an arid and probably cold environment, thus showing that human presence at this previously-thought deserted regions, included rough episodes during Gravettian/Proto-Solutrean times.
Furthermore, we present some preliminary data of the geoarchaeological study of the surrounding landscape of Peña Capón, mainly focused on the Sorbe River valley. Adding to the presence of El Reno cave, a previously-known rock art site bearing depictions of pre-Magdalenian style in the neighboring valley, these data show the existence of at least two potentially Upper Palaeolithic open-air sites, thus widening the human presence at the area.

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Amal Al Kassem

New insight into core reduction strategies of the Late Middle Palaeolithic of assemblage 6 (Yabroud Shelter I, Syria)

Yabroud Shelter I is located 60 km north of Damascus at the top of the Skifta Valley in the eastern Anti-Lebanon Mountains. The site has been considered a key site of the Palaeolithic in the Levant since its excavation by Alfred Rust in 1930s. Yabroud Shelter I includes 25 archaeological layers covering the Lower and the Middle Palaeolithic.
The reduction strategies of the Late Middle Palaeolithic assemblage 6, containing only layer 6, were reconstructed after the *Chaîne opératoire* approach and transformation analysis. End-products were obtained on the one hand by Levallois methods with a clear predominance of the recurrent Levallois method, the most common reduction concept in the Levantine Middle Palaeolithic, and on the other, by the production of 'secondary cores' on flakes or by the *Nahr Ibrahim* technique. Such an exhaustive and efficient strategy of core reduction seen by applying two different methods on the same nodule, reflects highly organised and skilled knappers. Initially, during this knapping process the longer flaking surface was used in order to obtain Levallois blades, elongated points or Levallois points. Afterwards the core was re-prepared differently in order to produce Levallois flakes out of the same nodule. The same efficient strategy can be seen in the intentional selection of discarded thick blanks in order to exploit them again; these were made from local material and indicate logistic investments in discarded artefacts as opposed to more distant raw material procurement strategies. These strategies were probably applied with prior knowledge of the spatial distribution of raw material sources, hunting places and best routes for moving. In turn, it allowed to hunter-gatherers to move between the highland and lowland in the events of climate changes or other factors.

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Exploring a novelty in the Middle Palaeolithic of Croatia: the open-air site of Campanož, Istria County

Middle Palaeolithic sites in the territory of Croatia have traditionally been divided into two geographic-ecological regions, Northwestern Croatia and the Adriatic region. While the former group is made exclusively out of cave sites, the latter has also featured open-air surface sites, mainly in the region around the city of Zadar (Northern Dalmatia). Due to the nature of surface finds i.e., the lack of stratigraphical data, the attribution of these sites to the Middle Palaeolithic was made exclusively on the grounds of typological classification of their lithic assemblages. However, uncertainties about the presence of later cultural manifestation, the timeframe of the accumulation of the finds, the geological processes which could have altered the original assemblages limit the potential of these sites for behavioural interpretations.
However, the relatively recent discovery of the open-air site of Campanož during rescue excavations in 2010 and 2011 in the Istrian peninsula by the Archaeological Museum of Istria may provide new data to bolster our understanding of Neandertal lifeways in this part of Europe. The site is a large and densely packed lithic scatter found some 70 cm below the surface and stratified between two horizons of typical Mediterranean *terra rossa* soil. Among the lithic finds there is a large presence of nodular chert fragments and a smaller proportion of chert artifacts which are clearly man-made and which were recognized as Middle Palaeolithic both on typological and technological grounds. The artifact assemblage consists predominately of debitage waste, while formal retouched tools are exceptionally rare. Along with the virtual absence of organic remains, this has led the original excavators to interpret the site as a lithic workshop, even though no chert nodules were found either in the vicinity of the site or *in situ* in the bedrock (Komšo 2011). The authors discuss the context of the finds and offer some hypothesis on the origin of the lithic assemblage. Furthermore, a methodology of distinguishing artefacts from geofacts is discussed in light of the large presence of seemingly

Fig.1: Aerial photo of the trench in 2011 with the artifact-bearing layer (Photo credit: Archaeological Museum of Istria).

naturally flaked chert at the site. However, a systematic lithic analysis is in progress, and due to the large size of the assemblage, preliminary results are not discussed in detail. Finally, the project within which this research is conducted is presented. The project IP-2019-04-6649 "Last Neandertals at the crossroads of Central Europe and the Mediterranean" (NECEM) is financed by the Croatian Science Foundation. It features several concentrated dating efforts as well as analyses and re-analyses of new and already researched material.

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Lithic transformation during the late Aurignacian phase at Hohle Fels Cave – implications for technology, site function and land-use

The transformation of lithic raw material at a given archaeological site reflects human behavior in regard to on-site conducted tasks, individual decision-making as well as environment- and culture-triggered pathways of dealing with everyday-purposes. On the other hand, intra-level raw material units and refits might reveal post-depositional processes and test the vertical integrity of archaeological sequences. Results of Transformation Analyses (Bataille, 2020) of the uppermost Aurignacian assemblages from Hohle Fels Cave give insight into hunter-gatherer's behavior in the Swabian Jura during this period (Bataille & Conard, in prep.). Archaeological horizons (AH in the following) IIIa and IIe represent the final phase of the Aurignacian at Hohle Fels during GI 7 (Riehl et al. 2014; Bataille & Conard 2018a; Taller & Conard 2019).

A special focus of our talk is the reconstruction of on-site transformation processes and its implications for site function and land use patterns during the Aurignacian in the Swabian Jura. It seems that during the final phase of the Aurignacian in this part of the Swabian Jura, hunter-gatherers primarily used local and regional chert variants - mainly Jurassic and less often Bohnerz chert (Burkert 2012). The occasional import of exogene material might reflect supraregional catchment areas.
We illustrate that raw material transformation analyses help to contextualize the embeddedness of lithic material within a functional context. From a technological point of view, the uppermost Aurignacian horizons, such as AH IIIa, show broad similarities with AH IV (Bataille & Conard 2018b). The reduction of burin-cores is typical while narrow-fronted carinated / nosed end-scraper cores are rare among bladelet cores. Nevertheless, a certain variability of lithic reduction concepts is present. At AH IIIa operational sequences indicate an import and on-site transformation of already prepared or initially reduced cores. The results will be discussed in the context of actual studies of lithic artefacts from Geißenklösterle and organic points from Hohle Fels and Geißenklösterle (Kitagawa & Conard 2020), which support earlier investigations about regional characteristics of the Aurignacian from Western Central Europe (Bataille & Conard 2018a). Moreover, they coincide with the observations of Aurignacian regional signatures in other regions (e.g. Tafelmaier 2017; Falcucci et al. 2020).

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Feeding the wolves? A 'dietary' case study of large canids in the Magdalenian cave site Gnirshöhle (Hegau Jura, SW-Germany)

The question, whether a dog is a dog or rather a wolf, became recently highly debated. Recent evidence points towards an onset of domestication at around 16 to 15,000 years ago including an intriguing example of the Kesslerloch cave (CH), where beside wolf remains, one large canid has been morphologically and genetically confirmed as dog. Regarding their diet, both canid groups fed on different food resources. Stable isotope (carbon-13 expressed as $\delta^{13}C$, nitrogen-15 expressed as $\delta^{15}N$) analyses suggested their placement in two distinct trophic niches with high $\delta^{15}N$ values for the wolves and low $\delta^{15}N$ values for the dogs.
Large canids from the cave site Gnirshöhle (D, see presentation by Münzel et al., p. 62 in this volume), located in direct neighborhood of Kesslerloch, both being separated by a mere 30 km, were examined in a recent study (Baumann et al., 2021) adapting a multidisciplinary approach combining morphology, genetics (see poster by Pfrengle et al., p. 74 in this volume), and stable isotopes. While morphological examinations and phylogenetic relationships did not unequivocally assign them to any specific canid lineage, the isotope analysis revealed a "dog-like" low $\delta^{15}N$ protein diet for all analyzed Gnirshöhle specimens. With respect to this finding and their proximity to humans, we conclude domestication as the most likely scenario. A change in the dietary habit of wolves could be the first step of their domestication, which on the other hand is at that stage not manifested in morphology or in mitochondrial genomes. Once the process of domestication began, humans quickly gained control over the diet, reproduction, and health of their new companions and thus set the stage for a lasting human-dog bond. Consequently, we consider the Gnirshöhle canids to likely represent an early phase in wolf domestication – facilitated by humans actively providing a food resource for those early domesticates.

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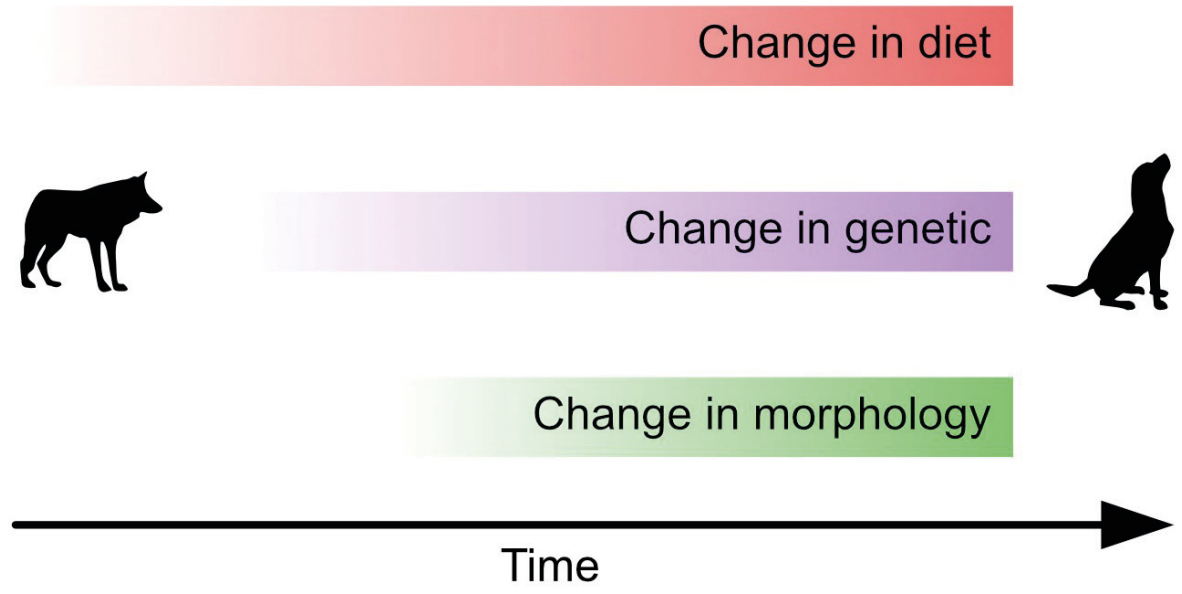

Fig.1: Different aspects of wolf domestication.

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Siah Beattie[1], Britt M. Starkovich[1,2] & Nicholas J. Conard[2,3]
Middle Palaeolithic Avian fauna from Hohle Fels, Germany and Neanderthal lifeways

Though recent research has provided increasing evidence for the consumptive and non-consumptive use of birds by Neanderthals, birds are still poorly represented at most Middle Palaeolithic sites in Europe. This absence is hypothesized to arise from either taphonomic and excavation biases, or the absence of these species in the subsistence strategies of Neanderthals. While the number of studies focused on avian remains in Middle Palaeolithic faunal assemblages has increased in recent years, there is still a substantial need for avian focused analyses at Middle Palaeolithic sites. While the importance of large mammals in the Neanderthal diet has been firmly established, studying small game, such as birds, offers the chance to develop a more nuanced understanding of Middle Paleolithic subsistence strategies. Furthermore, understanding the potential anthropogenic and non-anthropogenic accumulation of bird remains in Middle Palaeolithic sites can offer insights into natural avian accumulation processes in sites as well as the role of birds as active accumulators of faunal assemblages.

Hohle Fels Cave, in southwestern Germany, represents an ideal site for exploring these issues. The exceptional faunal preservation at the site, paired with the systematic screening of all sediments through a 2mm sieve, has resulted in the recovery of a remarkable number of bird remains. Furthermore, the site's location in the Swabian Jura, which is both an early entry point for modern humans and an important locus for Early Upper Palaeolithic innovation, frames this analysis within an important discussion on behavioural and dietary differences between modern humans and Neanderthals during the Middle Palaeolithic to Early Upper Palaeolithic transition.

This poster presents results from the ongoing taphonomic and taxonomic analysis of the avian fauna from a highly anthropogenic horizon and an anthropogenically sparse horizon at Hohle Fels. This study follows on previous work in Hohle Fels which analyzed avian remains from sedimentary columns, spanning the Magdalenian to Middle Paleolithic, and identified potential anthropogenic modification in all periods of the sequence; however, at

the time of that analysis the Middle Palaeolithic had only been reached in a small section of the cave, and culturally rich Middle Palaeolithic layers had not yet been reached. This analysis expands upon that preliminary look at Middle Paleolithic bird remains and provides further resolution to the temporal shifts in avian subsistence trends in Hohle Fels. Furthermore, the results are compared to data on gastroliths, the small stones from the gastrointestinal tracts of certain bird species, collected from the site, in order to determining how these finds can contribute to avian zooarchaeological studies. This zooarchaeological analysis of avian bones from two diachronic Middle Palaeolithic horizons contributes to the ongoing dialogue around the potential use of birds by Neanderthals, as well as the relationship between birds of prey and the accumulation of microfauna and small game at the site.

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Ekaterina N. Bocharova[1], Pavel V. Chistyakov[2], Galina D. Pavlenok[3] & Konstantin K. Pavlenok[2]
The Question of Price and Accuracy: A Comparative Study of Several Methods for Producing Images of Lithic Artifacts

Three main options to produce images of artifacts are currently available for researchers. These are graphic archaeological illustrations, photos, and 3D models. Each of them is useful for a variety of research tasks. This paper is intended to address an essential question: which method is the most accurate and cost-effective? A comparative study of 3D models obtained using a structured-light scanner, a high-precision photography (focus stacking), and a graphic illustration made by a professional archaeology artist has been carried out. Exemplary images depict Middle Paleolithic artifacts from the Chagyrskaya Cave (Altai) and the Kulbulak site (Tien Shan), and Mesolithic bone tools from the Kazachka site (Cis-Baikal region). We have performed the comparison for the following parameters: time to acquire one image; efforts; use of additional software and its cost; required skills; and accuracy of the resulting image. The research has allowed us to identify merits and flaws inherent in each imaging method. The options of various manipulations with each image type (metric measurements, obtaining cross-sections, and measuring coordinates for geometric morphometric analysis) and the quality of the data provided for the research have been considered as well. For example, we compared the cross-sections in the 3D model and in the graphic archaeological illustrations (Fig.1) .Special attention has been paid to the software, which allows generating projections for negatives on lithic tools (e.g. for scar pattern analysis). Well-known simplified algorithms for the 3D model and photo processing to get high-quality graphic images have been considered.

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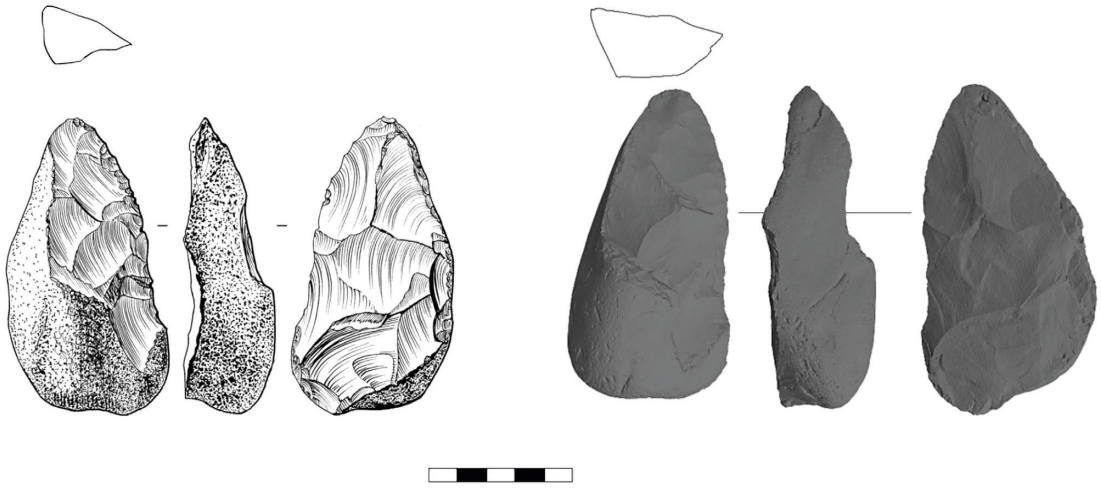

Fig.1: Graphic archaeological illustrations and 3D model of the same artefact.

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Hervé Bocherens[1,2], Dorothée G. Drucker[2], Hélène Rougier[3,4] & Christoph Wißing[1]
Isotopic insights into human diet during the Gravettian across Europe

The Gravettian is a pan-European techno-complex covering diverse ecological contexts. A dietary diversification has been suggested based on various methods. Exploitation of aquatic resources in addition to large herbivores seems to expand during this time period in Europe. An open question is whether this dietary diversity was a general feature throughout Europe or regionally organized in connection with the available resources. We will contribute to this topic using stable isotopic tracking on fossil bones.
Carbon and nitrogen isotopic ratios were measured on collagen from 36 human specimens – most of them directly radiocarbon dated – from Northwestern Europe (UK, Belgium), Southwestern Europe (SW France, Northern Iberian Peninsula, Italy), and Central and Eastern Europe (Czech Republic, Russia). Isotopic ratios were also measured from associated large mammals (reindeer, red deer, large bovids, horse, mammoth, and wolf). The data were collected from publications and include currently unpublished data from the Troisième caverne of Goyet (Belgium). Specimens that did not match collagen reliability criteria were excluded, as were juvenile specimens due to the possible interference of suckling maternal milk.
The results indicate that the main dietary source of proteins was large herbivores, but it was only in Central Europe where the mammoth was the main species consumed. In NW Europe, the mammoth was a minor component among the protein sources, in contrast with previous time periods (Aurignacian and late Neandertals). Aquatic resources were essentially consumed on coastal areas and along large rivers connected to the Atlantic Ocean. A diversity of protein dietary resources throughout Europe is therefore confirmed and seems to reflect the availability of local resources. Compared to the previous periods, the consumption of mammoth has significantly decreased, possibly reflecting the demographic decline of this megaherbivore species, except for Central Europe.

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WEAR 2.0_Hungary. Qualitative and quantitative analyses of surface alterations of stone tools: digital and physical reference collection for the characterization of manufacture, use and natural/accidental traces on stone raw materials from Hungary

Wear analysis applied to prehistory aims to characterize mainly qualitatively the surface alterations of tools made of stone, bone or other kinds of raw materials in order to determine tools functions and understand past human behaviors. The reliability and repeatability of the method is however questioned and the wear analysts face a major difficulty: to propose quantified and repeatable analyzes and interpretations of taphonomic and anthropogenic (related to manufacture and use) traces.
We propose to create an experimental reference corpus of traces allowing the characterization of the topographic signatures according to the processes of alteration, which generated them. This reference collection of surface alterations and their detailed qualitative and quantitative analysis aim at examining 1) what is the variability of surface alterations for and between each tested taphonomic and anthropogenic processes, 2) what repeatable, replicable and standardized protocol can allow to identify and characterize surface topographic signatures of a specific alteration process, 3) what are the appropriate metrological geometric properties, scale, resolution and statistics allowing to discriminate each of the alteration process.
This project will focus primarily on selected stone types from Hungary, commonly found in archaeological sites of the Carpathian basin. The use of focus variation, confocal and/or interferometric microscopes to acquire surface topography (Figure 1) and multi-scale surface analysis, from metrology, will allow to develop procedures of documentation and characterization of surface alteration specific to lithic material and to propose models of quantification of traces. Algorithms from artificial intelligence (deep learning in particular) will be used to verify if the models are reliable enough to determine the type of surface alteration undergone by each tool. This automatic recognition and classification of surfaces based on qualitative and quantitative data of surfaces will represent a breakthrough for the discipline. Beyond the major methodological step for wear analysis, the application on material from archaeological sites will provide new reliable key data for the understanding of human behaviors and adaptation in prehistory.

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The project is financed from the NRDI Fund (K 132857), Hungary.

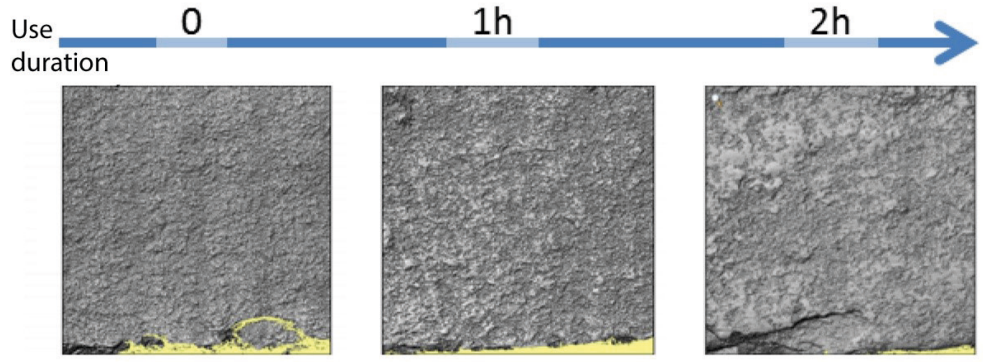

Fig.1: surface measurement of a flint tool before use, after 1 hour and after 2 hours of sawing wood. Note the development of the micropolish, already visible after 1h of use. (Illustration: Raphaël Deltombe).

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New fieldwork at the open-air loess site Ollersdorf-Heidenberg, Austria

The loess landscape of the Middle Danube region is extremely rich in Upper Palaeolithic sites including the famous sites of Willendorf II, Grub-Kranawetberg, Krems-Wachtberg (all Austria), Pavlov I, Dolni Vestonice I & II (all Czech Republic). Most of these sites are characterized by numerous archaeological remains suggesting a high intensity of human occupation. Here we explore a different kind of site: Ollersdorf-Heidenberg in Lower Austria can be described as a low-density site. The site was discovered through pipeline works in 1998 and then again 2007, each lead to a short salvage excavation campaign where a diverse faunal assemblage and a burin-dominated lithic collection were recovered. In August 2017, the current team started fieldwork close to the 1998 and 2007 trenches to explore the potential of the site for future work. Our fieldwork in 2017 and 2018 included coring to determine the extent of Palaeolithic archaeological horizons. Two areas with potential were identified and investigated through two test trenches. In our contribution, we focus on Trench 1, in which we exposed a loess sequence of 2.3 metres thickness through excavation and a further 2 metres through hand-augering. Embedded in this sequence are two archaeological horizons, which we excavated on nine square metres. Both archaeological horizons are low in find density and contain mainly undiagnostic faunal, lithic and stone material as well as charcoal. The lower horizon includes a nano-gravette point suggesting a Gravettian attribution of the assemblage, which is in good agreement with a first radiocarbon date on charcoal. Faunal remains are generally coated in calcite concretions and include several horse remains. We will present preliminary results of our study of site formation processes, environmental context of the human occupations, and explore the question of the intensity of human occupation and impact on sediments.

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The Middle- and Upper Paleolithic occupations at Feldberg "Steinacker"

The open-air site Feldberg "Steinacker" is mostly known for its enormous amount of Upper Paleolithic stone tools, most of them surface finds, encompassing high quality reduction sequences, as well *fossil directeur* like Font- Robert points or Micrograveттes. In contrast, traces of an older Middle Paleolithic occupation were as scarce as for post-Gravettian ones.
This picture was somehow turned upside down by the last three excavation campaigns led by the State Office for Cultural Heritage Baden-Wuerttemberg in cooperation with the University of Rostock. It is well known that many paleolithic open-air sites are complex palimpsests. This makes geological and micromorphological investigations even more important. Recent studies uncovered a complex paleosurface characterized by small-scale relief features like mounds and depression. It was possible to identify a complex sequence of several loess-paleosol layers, with a paleosurface characterized by small-scale relief features like mounds and depression.
The top-layers of these formations seem to be largely intact as micromorphological analysis shows. OSL dating of the loess sequence yielded ages between 100 ka and 24 ka. Recent use-wear analysis of the lithic assemblage confirmed human activities also on unstandardized thermal flakes in the oldest horizons. These finds are accompanied by a small number of high-quality Middle Paleolithic artefacts like a side scraper and tools that can be traced back to the Levallois concept, which were recently documented within stratigraphical context.

Fig.1: Upper part of the profile from pit 8 with a short sequence of darker wet soils and accumulation of loess.

Fig.2: Aerial photo of the excavation site with the Rhine valley and the Vosges mountains in the back.

The preliminary results show the great potential and complexity of the open-air site confirmed once again by the discovery of an ephemeral living floor of possibly Magdalenian age during the most recent campaign and makes "Steinacker" the only open-air site with an intact Middle- to Upper Paleolithic sequence in southwestern Germany.
In this talk we will give a summary about the state of research regarding the excavations, the ongoing interdisciplinary investigations, and the scheduled plans for the project. Additional information about the conducted studies (Geology, Micromorphology, OSL- dating, Use-wear and lithic analysis) will be available throughout a poster presentation.

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Norbert Buchinger[1], Michael Brandl[1], Thomas Einwögerer[1] & Kerstin Pasda[2]
The lithic industry at Gösing-Setzergraben: New insights on the Early Gravettian in Lower Austria

Overlooking an alluvial plain formed by the Danube, the so-called Tullnerfeld, the area around Gösing am Wagram has been known for its Upper Palaeolithic findings since the 19th century. Beside numerous surface finds, faunal remains and lithic artefacts were documented in wine cellars dug into the several meter thick loess deposits. In the course of construction works in 2014, a 3 x 3 meter wide pit was mechanically excavated into the loess sediments thereby cutting four archaeological layers. Subsequent investigations were carried out by the Austrian Academy of Sciences comprising the documentation of profiles, the excavation of a small preserved area in the construction pit and the water-screening of the mechanically excavated spoil. The uppermost archaeological layer AH 1, several centimeters thick and characterized by charcoal and ashy inclusions, contains multiple patches of burnt sediment as well as the remains of an *in situ* preserved multi-phased, slightly dug in hearth. In contrast, the subjacent horizons AH 2, AH 3 and AH 4 are marked merely by thin bands of charcoal scatter. The water-screened find assemblage Gösing-Setzergraben includes burnt and fragmented stone slabs, quartz pebbles, colour materials and a high amount of charcoal. While faunal remains composed of elements characteristic for a cold stage – mainly mammoth, reindeer, horse, bison, tundra hare, and carnivores such as wolverine, polar fox, and steppe polecat – are sparse, the assemblage contains more than 3500 lithics. Resulting from the techno-typological analysis, the lithic industry can be attributed to the Pavlovian. In general, the core technology is based on a unipolar reduction strategy aiming at the standardised production of blades and bladelets. With burin-like cores on flakes, a second exploitation strategy targeting for narrow blanks can be documented.

The lithic tool assemblage is primarily characterized by microlithic types such as backed bladelets, microdenticulates and Micrograveтte points. As the number of documented tool types is low, the inventory displays a high degree of specialisation. Raw material analysis reveals a predominantly import-based raw material economy characterized by glacial deposits in the form of erratic flint whereas raw materials deriving from local sources are rare and represented by few specimens only. The inventory at Gösing-Setzergraben thus contrasts sharply with hitherto known contemporaneous assemblages from the Lower Austrian Danube region, most notably from the nearby site Krems-Wachtberg 2005-2015, where local resources from river gravels dominate. While the circumstances of artefact recovery substantially limit conclusions regarding site formation and spatial organisation, the exceptional pattern of resource distribution provides various potential interpretations. Considering the absence of micro-moves to procure local raw materials, the lithic industry at Gösing-Setzergraben can possibly represent initial phases of occupation linked to hunter-gatherers who, coming from the north, were still sufficiently supplied with high-quality raw materials. Alternatively, the high proportion of imported erratic flint may result from provisioning strategies stockpiling resources at a frequently visited location. The evidence of differing approaches to raw material acquisition at sites in both chronological and geographical close context can contribute to a more profound understanding of subsistence strategies, land-use patterns and long-distance networks during the Early Gravettian in the Lower Austrian Danube region.

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Success, limits and failure of subsistence strategies in eastern Central Europe during the early Gravettian and the Last Glacial Maximum – objectives and first results

In Central Europe, the period between 30 and 20 ka is characterized by a dramatic decrease in the number of archaeological sites. In contrast to other areas north of 47°N, however, the study region, consisting of northeast Austria, Moravia, and southern Poland, seems to have maintained a small but viable population of hunter-gatherers until around 22 ka. The project "Success, limits and failure of subsistence strategies in eastern Central Europe during the early Gravettian and the Last Glacial Maximum", funded by DFG and FWF, addresses the environmental conditions and the adaptive strategies developed by hunter-gatherer societies in this region. To this end, we compare the environmental and archaeological findings for sites dated as early Gravettian (ca. 33-29 ka), a period of many cultural innovations and comparatively favorable climatic conditions, to findings from sites dated to the Last Glacial Maximum (LGM) with a focus on the key-site of Kammern-Grubgraben (around 23 ka). We combine archaeological analyses (e.g. of lithic and organic tools), osteoarchaeological information, and on-site sedimentary and paleoenvironmental proxy data (geochemistry, stable isotopes, biological remains) with a diachronic perspective. Special attention is directed to the following questions: what are the environmental differences between the early Gravettian and the LGM and how did climatic changes in temperature and humidity affect vegetation and prey species? What are the specific adaptations of the LGM hunter-gatherer societies compared to those of the early Gravettian? This poster presents the project's outline and preliminary results.

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Aitor Calvo[1,2], Luís Gomes[3], Lars Anderson[4], Damien Flas[4,5] & Marianne Deschamps[3,4]
Back to the Gravettian at Gatzarria cave (France): new insights from the comparative analysis of the lithic assemblages from old and new excavations

In recent years the re-excavation and re-evaluation of previously studied sites using new and modern methods and perspectives have generated a considerable amount of novel data regarding the Gravettian in the western Pyrenees. Among these different projects, Gatzarria cave is a prime example of the aforementioned scientific revalorisation of this technocomplex. Originally excavated by G. Laplace between 1961 and 1976, the new excavations, conducted under the direction of M. Deschamps, L. Anderson, and D. Flas since 2017, are actively providing new and valuable information on the site formation processes and are filling some of the knowledge gaps in the archaeological record that remain since Laplace's interventions, such as the radiometric chronology.
While the original excavations explored, for the most part, the interior of the cave, recent excavations have turned towards trying to understand the dynamic between the cavity and its associated terrace. On the terrace, a lithic assemblage attributed to the Gravettian has been recovered in the stratigraphic unit 102 (and related 101 and 103 units). The comparative analysis between this assemblage and that which Laplace also assigned to the Gravettian from the interior of the cave (assemblage from level Cbcs) has allowed us to 1) determine the existence of significant similarities in terms of the technical and the lithic-resource management between both assemblages, underlining their homogeneous cultural attribution; and 2) propose two different hypotheses regarding the nature and formation of both Gravettian stratigraphic units and assemblages. The first proposes two distinct occupation areas (outside and inside the cave). The second proposes that Laplace's Gravettian level (Cbcs) is the result of post-depositional processes that have relocated sediments from the original accumulation area (located on the terrace east of the entrance) into the cave following its natural configuration and slope of its deposits. These hypotheses will be tested in the coming years thanks to the ongoing excavations at the site, the application of various analytical tools oriented towards understanding the geoarchaeological history of the deposits (lithic particle size distributions, fabric analysis, lithic refitting), and the improved comparative analysis of the assemblages via the methodological standardisation of their study.
These analyses, when combined with novel data regarding the radiometric chronology, subsistence strategies, and aspects of palaeoenvironmental reconstruction will allow us to provide a newly contextualized and holistic understanding of the Gravettian occupation(s) at Gatzarria. Beyond site-level questions, this novel work will also help situate Gatzarria's Gravettian within larger cultural geographic scales, as it provides a concrete link between the Gravettian of the Garonne and Ebro valleys.

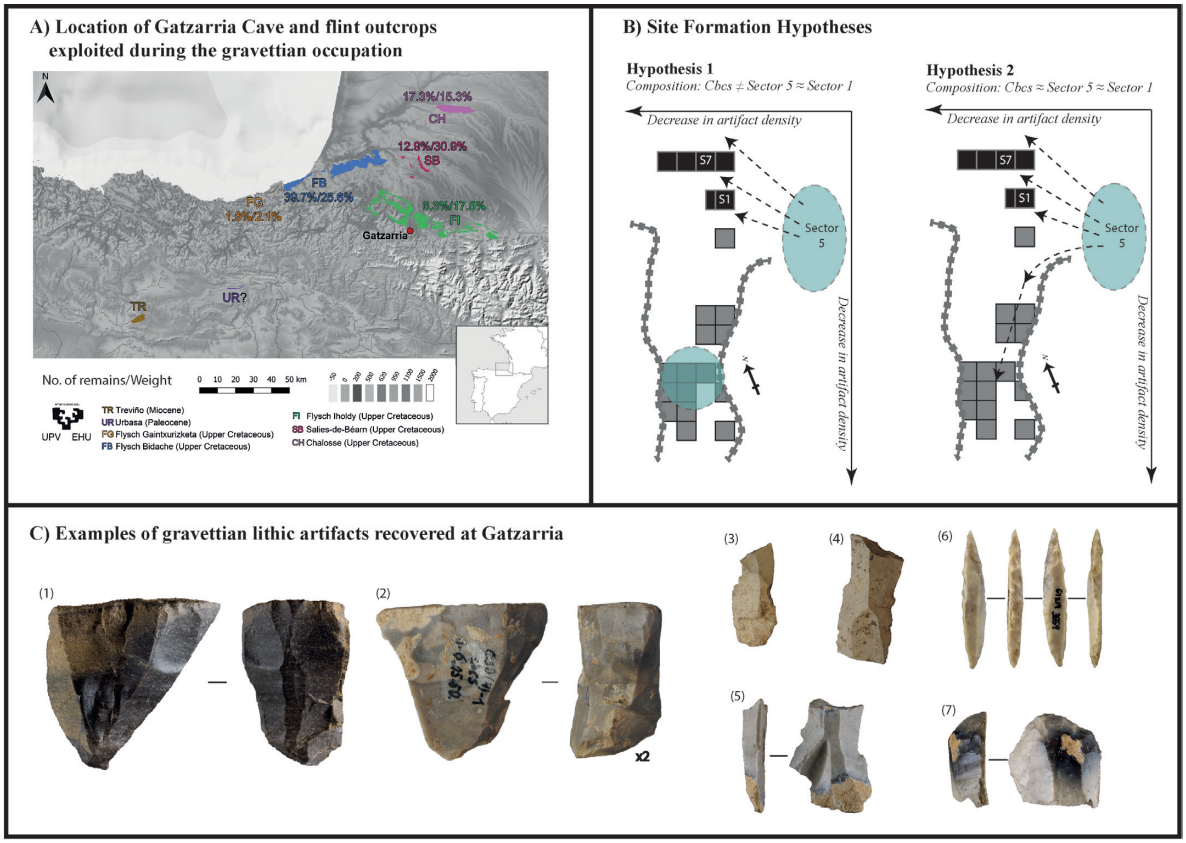

Fig.1: A) Location of Gatzarria Cave on the Western Pyrenees and flint outcrops exploited during the Gravettian occupation (the values present the relative frequency of flint elements recovered on Cbcs assemblage by count and weight, respectively); B) Site formation hypothesis considering the preliminary data obtained up to date: the squares represent the areas excavated during the 1961-1976 campaign (gray – level Cbcs) and during the 2017-2019 campaign (black – sectors 1 and 7), the blue circles represent hypothetical areas of original artifact accumulation, and the dashed arrows represent potential run-off effects transporting material from said accumulation areas; C) Examples of lithic artifacts recovered at Gatzarria: 1-2) Prismatic core with single striking platform; 3-5) Noaille burins; 6) Microgravette; 7) Distal fragment of Endscraper (note: artifacts 2-4 were recovered during the 1961-1976 campaigns; artifacts 1 and 5-7 were recovered during the 2017-2019 campaigns).

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Sewing with stones. Use-wear analysis of Gravettian Noailles-type burins from Isturitz cave (Basque Country, southwestern France)

This poster presents the results achieved in the techno-typological and use-wear analysis of the Noailles-type burins from level IV from Isturitz cave. This study was accompanied by an experimental programme aimed at determining the potential functionalities of these tools and to serve as point of comparison between the archaeological and replica specimens. Both works revealed that these burins were a highly standardised tool; in particular, it is a small morphotype generally made from a very narrow bladelet, usually on an oblique and concave truncation. This created a sharp active zone (the dihedral) where the use-wear traces were normally located.

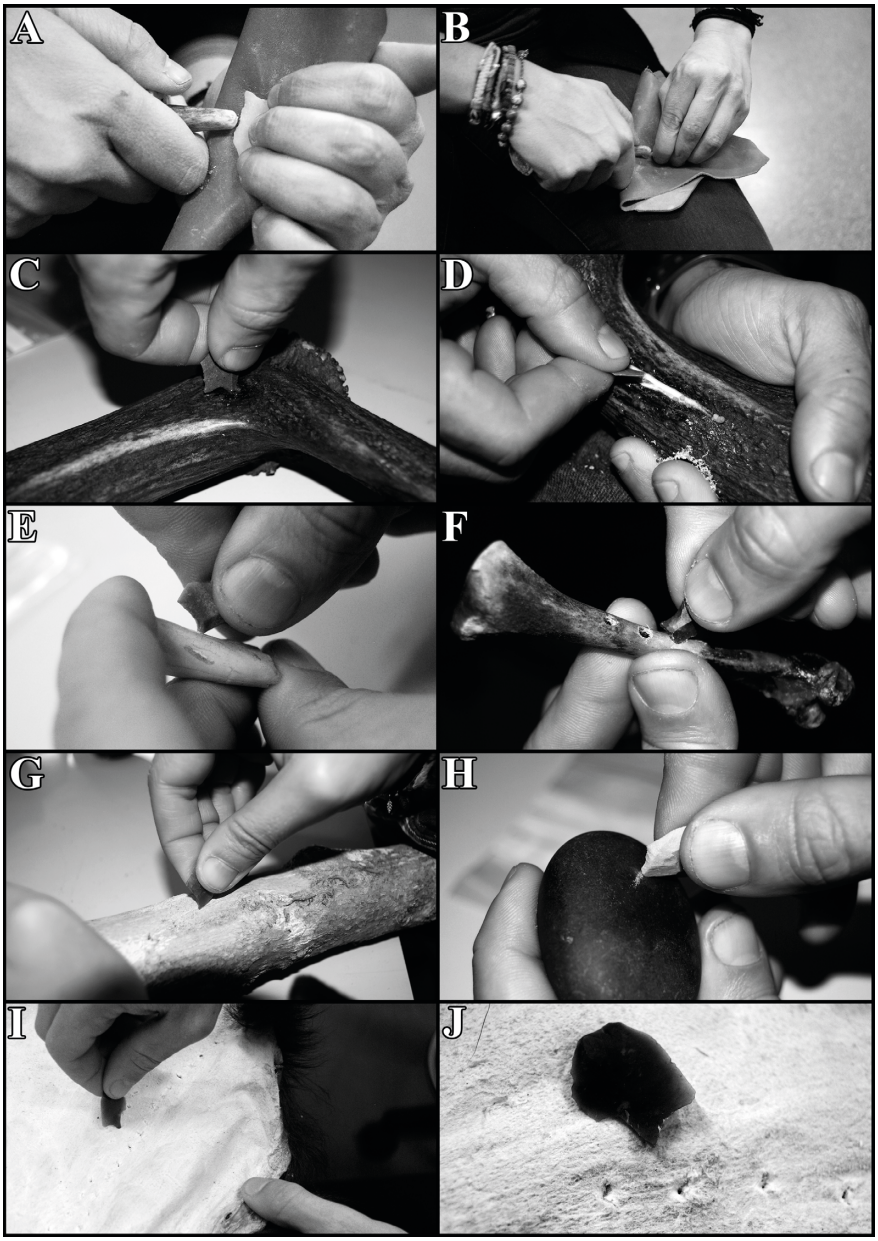

Fig.1: Development of the experimental programme. A) Retouching a stop-notch with a deer antler crown tine; B) Removing the burin spall with a deer antler crown tine; C) Drilling a deer antler (main beam); D) Grooving a deer antler (main beam); E) Drilling a horse incisor; F) Drilling a bird bone; G) Drilling boxwood; H) Drilling lutite; I and J) Drilling a goat dry hide.

Their distribution showed that these artefacts were used mainly for piercing, while the faintness of the traces suggest that they were employed with quite soft materials, such as dry hide. Experimentation demonstrated the effectiveness of these implements for piercing dry hide, and the use-wear on the experimental burins correspond to the traces observed on archaeological burins. It also showed that the Noailles burins of Isturitz cave are incompatible with harder materials or tasks of longer duration or intensity.

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Homo sapiens open-air occupations in Eastern Morocco (Jerada Province)

Data from *Homo sapiens* MSA-LSA occupations of Morocco are well-known from cave and rockshelter sequences. Nevertheless, open-air settlement dynamics are practically unknown, due the lack of systematic excavations and recording archaeological sites, not documented by the layering of its deposits but attested from disperse and unstratified lithic scatters around it. For the last fifteen years, we have undertaken systematic surveys and archaeological excavations at the Aïn Beni Mathar – Guéfaït basin (Jerada province), allowing the discovery of different stratified open-air locations and providing new data about the *Homo sapiens* interactions with semidesertic environments similar to the current actual landscape. The new documented sites are mostly located on slopes and exposed surfaces of riverbanks, around springs, and appear to be associated with areas rich in both biotic and abiotic resources.

In this paper, we present new data about different open-air locations discovered in the Sahb el Ghar – Swiwina plain and the Tahya-Oued Za river area, where systematic excavations at SBG1, SBG2, and Oued Charef MSA sites and preliminary test pits at Tahya 3, 4 and Ain Tifirassine LSA sites have been carried out (Figure 1).

Technologically the MSA sites are characterized by homogeneous sets of flake assemblages with important Levallois components (preferential and recurrent) but also discoidal and opportunistic strategies. Retouched tools are abundant, mainly denticulates and scrapers, and at some locations "Aterian" assemblages with tanged pieces and bifacial foliates have been documented. The only MSA site with both fauna and lithics remains is Tahya 3 where cranial and postcranial remains of Alcelafini (*Alcelaphus cf. buselaphus*) are associated to knapping products and some hammerstones (Figure 1B).

The LSA sites show a higher density of lithics remains composed by standardized laminar and flake assemblages including all the reduction sequence stages. The number of laminar cores and backed blades and bladelets show the typical technological attributes characterizing the Iberomaurusian culture. These assemblages are associated to structured hearths that can be interpreted as domestic areas (Figure 1).

Our interdisciplinary results will provide an overview of the MSA-LSA dynamics at open air contexts, focusing on the subsistence strategies, the territorial mobility, and the type of occupations depending on the available resources. This work will provide a broader perspective of the *Homo sapiens* technological evolution and adapting strategies during the North African Middle and Later Stone Age.

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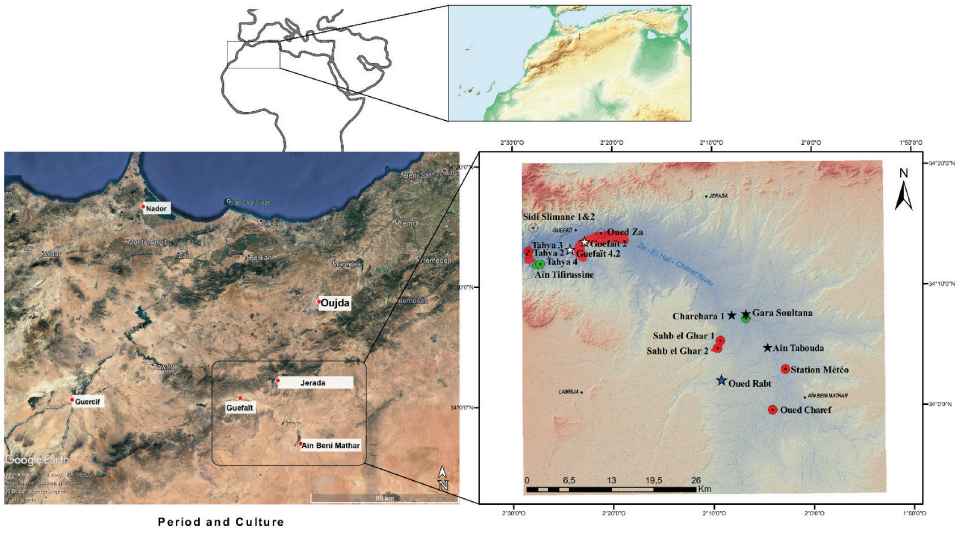

Period and Culture

Fig.1: 1A) Map showing the location of the MSA & LSA sites (Map by J.I. Morales); 1B) View of some of some of the excavated sites: Sahb el Ghar 1 and 2, Aïn Tifirassine; Tahya 3 & 4; 1C) Examples of MSA (1Ca to 1Cj) and LSA (1Ch to 1Cr) lithic assemblage (Photos IPHES).

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Nicholas J. Conard [1,2], Maïlys Richard[1] & Britt M. Starkovich[2,3]

Ongoing excavations at Hohle Fels Cave in the Ach Valley offer new insights into the Middle Paleolithic of the Swabian Jura

Fieldwork at Hohle Fels Cave in the Ach Valley of the Swabian Jura has continued annually under the current direction for the last 24 years. Excavators have now reached a depth of 4.5 meters below the original surface and 1.5 meters beneath the base of the rich Aurignacian deposits at Hohle Fels, which dates to ca. 42 ka BP. The layers immediately underlying the Aurignacian are essentially sterile and suggest that the makers of the Aurignacian enter this part of the upper Danube drainage during a period in which few or no Neanderthals inhabited the region. Moving from top to bottom, the Middle Paleolithic deposits corresponds to archaeological horizons (AH) VI-XI. The dates for the upper Middle Paleolithic horizons fall in the rage of 45 ka BP based on numerous radiocarbon dates, although dates near the limit of the method are notoriously imprecise. As one would expect, the find density and intensity of occupation varies in the Middle Paleolithic deposits with AH VI-IX generally showing low densities of cultural materials over a thickness of more than one meter. In 2020 the team started digging AH X and XI, where we for the first time encountered relatively high find densities of anthropogenic materials.
To our surprise, we recovered a well-preserved, complete leaf point made from local Jurassic chert in AH X, which represents the first find of this kind documented *in situ* since Gustav Riek's excavation at Haldenstein Cave in 1936. Traditionally, the leaf points of the *Blattspizengruppe* are viewed as the youngest phase of the Middle Paleolithic, although the cultural and chronostratigraphy of bifacial lithic artifacts of the Middle Paleolithic have been a topic of intense debate in recent decades. AH X and XI contain the richest lithic and anthropogenic faunal assemblages we have recovered from the Middle Paleolithic deposits at Hohle Fels. Anthropogenic materials including lithic artifacts and burnt bone occur at levels comparable to the Upper Paleolithic horizons at Hohle Fels. AH X, which contained the leaf point, is stratigraphically in a much deeper position than one would expect for finds from the terminal Middle Paleolithic.
This paper will provide an overview of the ongoing excavations at Hohle Fels, including assessments of the chronostratigraphy with new ESR dates, and data on the lithic and faunal assemblages from AH X and XI.

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Holger Dietl[1], Marcel Weiss[2,3] & Tobias Lauer[3]
A rare Middle Palaeolithic „Non-Silex"-Industry with Pebble Tools and Microlithic Artefacts from Bad Dürrenberg, Saxony-Anhalt

In summer 2020, due to the re-excavation of the famous mesolithic burial site at Bad Dürrenberg, Saxony-Anhalt, a gravel bed containing a Middle Palaeolithic assemblage was discovered. Situated about 16 m above the today's river Saale, an extended gravel layer with a thickness of about 15 cm was found, which contained a high number of well-preserved pebble artefacts. A sediment sample just below the main archaeological layer provided an OSL date of about 130 ka. Further OSL dating will follow.
Our first preliminary lithic analysis shows that in addition to an unusual high number of pebble/core tools, some microlithic cores and blanks as well as several typical Middle Palaeolithic artefacts can be identified. The latter include scrapers, notches, denticulates, a unifacial point, knife-like (Keilmesser-like) pieces and very few Levallois artefacts.
Even in the early stages of our lithic analysis, lithic refits and the state of preservation point towards some autochthonous elements at the open-air site in Bad Dürrenberg. However, a redeposition of pebbles and artefacts potentially occurred.
The rarity of locally available flint in the gravel bed led to an almost exclusive use of lower-quality or "unusual" raw materials. Neanderthals specially adapted their efficient technology to the local pebbles of quartz, quartzite, porphyry and radiolarite. The final tools show a typological diversity, potentially applied to a variety of tasks.
Typologically and technologically, the Middle Palaeolithic industry of Bad Dürrenberg shows similarities to the Microlithic Middle Palaeolithic (Taubachien) in Eastern Europe, such as the sites of Kůlna, Předmostí II and Tata (Svoboda et al. 1996; Moncel/Neruda 2000). Bad Dürrenberg also shares the presence of a pebble tool component with the nearby Middle Palaeolithic site of Neumark-Nord (2/0 and 2/2) (Laurat/Brühl 2006) in Saxony-Anhalt.

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New data on hominid adaptations in the Middle Paleolithic from Saradj-Chuko Grotto, North-central Caucasus, Russia

Only two stratified sites provide evidence of Middle Paleolithic settling in the North-central Caucasus. These are Weasel cave (Myshtulagty Lagat) in the east (Kazbek region, Northern Ossetia-Alania Republic) and Saradj-Chuko grotto in the west (Elbrus region, Kabardino-Balkaria Republic) of the North-central Caucasus. Both Weasel Cave and Saradj-Chuko grotto are located in basin of the Terek River flowing to the Caspian Sea.

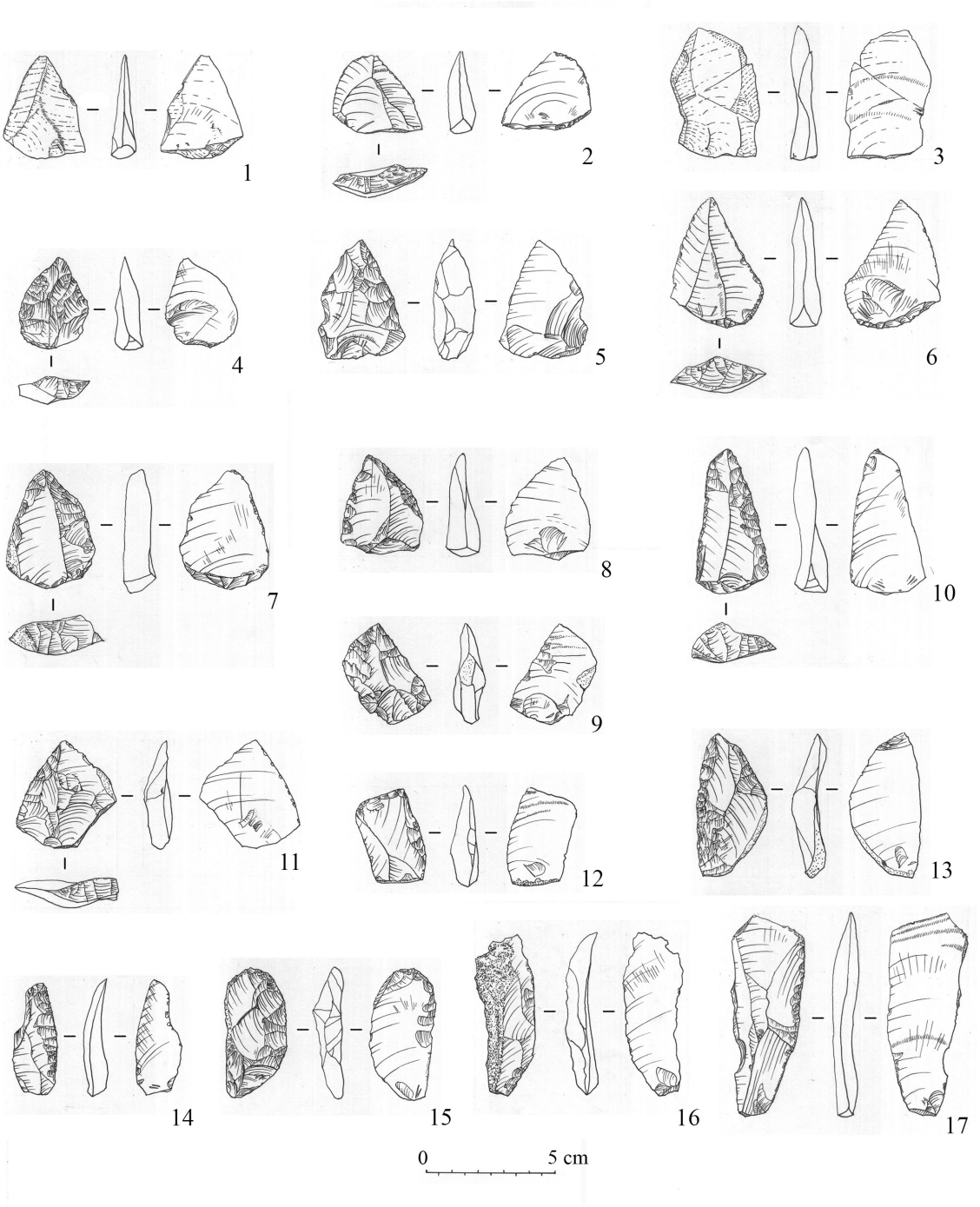

Fig.1: 1-17 - Lithic artifacts from Ly. 6B at Saradj-Chuko Grotto, North-central Caucasus.

The research in Saradj-Chuko grotto close a gap in our knowledge about the Neanderthal occupation in the Elbrus region and entire western part of the north-central Caucasus. The laminar technology differ the MP laminar Mousterian industry of the North-central Caucasus, represented at present in Saradj-Chuko grotto and Weasel cave, from the Micoquian industry widespread in the north-western Caucasus. A large lithic assembladge excavated from Layer 6B (10959 artifacts) indicates that this Layer represents the level of most intensive (on average about 295 lithic artefacts per m^2) occupation in Saradj-Chuko grotto (fig. 1). Preliminary results of analysis of lithic and faunal assemblages show that in Layer 6B Neanderthals were engaged in intensive knapping of local obsidian, and production and use of tools mede mostly from obsidian for butchering and consumption of hunting prey that was represented mainly by ungulate animals. In Saradj-Chuko grotto, layer 6A, the lower MP level where volcanic ash was found, overlaps the level of active Neanderthal habitation in the grotto in layer 6B. After the eruption recorded in layer 6A, the local Neanderthals only occasionally visited the cave site.

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Dorothée G. Drucker[1] & Carole Vercoutère[2]
Tracking mammoth ecology and origin in southwestern France during the Gravettian: isotopic case study of Grotte du Pape at Brassempouy (Landes, France)

In southwestern France, remains of woolly mammoth (*Mammuthus primigenius*) are almost exclusively represented by ivory pieces during the early Upper Palaeolithic (ca. 40 to 28 kyrs ago). The rarity of mammoth bones raised doubts on the occurence of this species in the surrounding environment at that time. If not associated to the exploitation of local animals, the ivory could have been accessible through the importation of allochthonous material and/or use of local subfossil accumulations. In this paper, we explore the question of origin of mammoth raw material through the stable isotope ratios in ivory specimens from the Grotte du Pape at Brassempouy (Landes, France). This site yielded ivory fragments and objects attributed to the Gravettian techno-complex, while mammoth bone remains were absent. We have applied direct radiocarbon dating to decipher the age of the ivory pieces and consider if they could fit the time range known for the Gravettian culture in this region. Measurements of carbon-13 and nitrogen-15 abundances on collagen served to investigate the ecological niche of the mammoths that provided the ivory. We then compared it with the isotopic trophic position expected for animals in the local context of southwestern France. In case the observed isotopic pattern differs from the expected one, we should still consider the hypothesis that the mammoth was occupying a marginal niche due to unfavorable environmental conditions. Thus, the analysis of the sulphur-34 abundances has been conducted to obtain additional indication regarding the geographical origin of the ivory of Grotte du Pape.

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Diana Dudnyk

The new investigations of the Barmaky site in Northwestern Ukraine, 2018-2020 field campaigns

The Upper Paleolithic site of Barmaky is located on the Volhynian loess plateau, on the eastern outskirts of the Rivne city. The site is situated on the western gentle slope of a low cape of the left bank of the river Ustya which is a right tributary of the Goryn River (right tributary of the Pripyat River, Dnieper basin). The Barmaky site was discovered in 1981 and excavated until 2007. The total excavated area composes 217 sq. m. Last three years it is being studied by the international expedition from the Institute of Archeology, Kyiv and the University of Erlangen and Nuremberg in the frames of the DFG grant #392605832.
During last three field seasons 72 sq. meters were studied. The stratigrphical sequence is represented by 9 lithological layers and two archaeological levels. The first – upper archaeological level found in redeposited sediments of yellow loess-like loam; the second – lower archaeological level originates from the whitish loess-like loam. Cryoturbation processes affected deposits of the lower level. Despite it, archaeological materials show a satisfactory state of conservation; the bone surfaces were not eroded, the flint artifacts neither patinated nor naturally damaged. The second level dates around 19 kyr cal BP according to radiocarbon analysis of bone samples (*OxA-38249*, 18887 ± 224 cal BP; *OxA-X-2804-40*, 18971 ± 231 cal BP; *OxA-38250*, 19050 ± 222 cal BP). Two pits with animal bones, marl concentration (crust) on an area of about 10 sq. m., and dwelling structure were excavated in the deposits of the lower level. The site has two activity areas.
About 155,000 flint artifacts originate from the second level. The cores (1%) are subdivided on uni- and bipolar pieces for blades and bladelets production. They are represented by narrow flaking surface items. The blade products consist of blades (17%), bladelets (16%) and microblades (8%). Tools are represented by almost 4%. The specificity of the flint industry of the Barmaky site consists in the dominance of burins (49%) and non-geometric microliths (25%). Most of burins made on obliquely truncated blades. More than two-thirds of microliths made on microblades. The characteristic feature of microliths is the presence of a straight abruptly retouched lateral edge and obliquely retouched base part. Truncated pieces (19%) usually were made by oblique truncation of blade distal end. The rest of tool types are not numerous: end-scrapers – 3%, perforators – 1%, etc.
There were found artifacts on bones, tusks and shells. The technological and typological characteristics of the artifact assemblage and the specificity of the fauna (mammoth, reindeer, deer, horse, brown bear, wolf, fox, arctic fox and hare) is typical for Epigravettian complexes of the Middle Dnieper basin. The closest analogies are represented by the following sites: Mizyn, Mezhyrich, Gintsi, Dobranichivka, Semenivka 1, 2 and 3, dating between 16-18 kyr cal BP.

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Michaela Ecker[1] & David Morris[2]

The early Middle Stone Age excavations at Pniel 6, South Africa

The transition from the Early Stone Age (ESA) to the Middle Stone Age (MSA) is evident in assemblages dating to 200ka to 500ka in the central interior of South Africa. It is characterized by heterogeneous lithic assemblages, including blades suggesting the emergence of hafted hunting technologies (Wilkins and Chazan 2012). With a very limited number of caves and rock-shelters in the region, the open-air sites along the lower Vaal river, such as Pniel 6, play a major role in our understanding of the emergence of the MSA in interior South Africa (Beaumont 1990). We re-investigated Pniel 6 with high-resolution modern fieldwork techniques and present here results from the 2017-2019 excavations. We excavated c. 10m^2 in 4 separate excavation areas. Of these, area 3 is the largest area and the focus of this presentation. Detailed stratigraphic description of the sedimentary deposits and fabric analysis enables us to assess the integrity of the archaeological assemblage.

Our assessment of the excavation area 3 lithic assemblage shows blades and points from prepared cores are frequent, while large cutting tools are absent. The technological affinities are similar to other transitional ESA-MSA sites in the region, but Pniel 6 stands out among them as a lithic assemblage predominantly made from hornfels. We discuss the results within the framework of the chronology of the ESA-MSA transition in the Northern Cape Province and its varied methods of stone tool production using distinctly different raw materials, even within relatively small regional distances.

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Armando Falcucci[1] & Marco Peresani[2,3]
Assessing the Gravettian evidence from Fumane Cave

In this presentation, we examine the evidence from the youngest cultural unit at Fumane Cave (Venetian Prealps, northeastern Italy) and address Gravettian settlement dynamics in the Great Adriatic-Po Region (see Peresani et al., 2020). Recently, we assigned the lithic assemblage from unit D1d to the Gravettian after a thorough techno-typological assessment (Falcucci & Peresani, 2019). Our results suggest that foragers took advantage of the ecological and mineralogical setting of the western Lessini Plateau and possibly used the site as a hunting stop and a flaking workshop. Moreover, an unusual charcoal feature unearthed during archaeological excavations indicates that a not-yet defined specialized activity took place in the innermost zone of the cave. Differences with the underlying Protoaurignacian assemblages (Falcucci et al., 2020) are evident. We will focus on the main challenges associated to this interpretation, paying into consideration site formation processes and assemblage integrity. Our main research questions can be summarized as follows: what are the causes of the significant diachronic variations in site-use strategies? Does the evidence from Fumane support the idea of an ephemeral presence of the Gravettian in the region? We will thus conclude with some thoughts on the role of the northern rim of the Great Adriatic-Po Region in the expansion of the Gravettian technocomplex across Italy.

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Miriam Nývltová Fišáková[1], Mietje Germonpré[2] & Martina Lázničková-Galetová[3]
Seasonality in the fossil large canids from Předmostí.

The seasonality or permanent settlement of important Central European Gravettian localities is a question that has long been discussed in Palaeolithic . Studying the season in which animals died helps not only to make a better palaeoecological assessment of the archaeological situation, but also gives insight into the socio-economic relations amongst huntergatherer cultures. Knowing the season in which a particular animal was hunted allows derivation of information about hunting and settlement strategies, i.e. why and when the location was used by humans. The seasonality of Upper Palaeolithic settlements can be followed based on the eruption sequence and the abrasion of the crowns of teeth from hunted animals with a knowledge of when the individuals were born, or by the epiphysis closure sequence in the postcranial skeleton. Abrasion of the crowns, however, only indicates the relative age. The third reliable way to determine the age of an animal besides the tooth eruption and the epiphyseal closure sequences is to analyse the microstructures of increments of tooth cement. This more time-consuming procedure can also be used to determine the season in which the animal in question was killed. Based on the age of the teeth and the hunting season, it is possible to ascertain whether the teeth belonged to one or more animals.
Předmostí is part of a series of large Gravettian open-air sites located in Central Europe characterised by distinctive lithic tools (Leaf points, Kostenki knives, micro-saws, geometric microliths), and by the presence of mammoth remains and ivory implements, ornaments, portable art and animal including human female representations. Mammoths played an important role in the Central European societies of Gravettian hunter-gatherers, both in life (e.g. Leaf points, Kostenki knives, micro-saws, geometric microliths) and in death (several human burials were covered by mammoth scapulae). At Předmostí, the mammal assemblage is dominated by mammoth. After the mammoth, the large canids are the most abundant group at Předmostí based on the Minimum Number of Individuals (MNI) calculations. In total, 13 teeth of large canids from the sites of Předmostí (Moravia, Czech Republic) have been analysed to determine their season of death. The teeth come from excavations carried out in 2006, as well as from those done by J. Wankel and K. J. Maška at the end of the 19th century. This is evidently a separate settlement concentration. Not much spatial information is available for the bones from the old surveys: only that they come from the settlement (locality Ia), i.e. that they were found in the vicinity of Skalka. The teeth from 2006 were discovered at the Mammoth Hunters' Monument, which stands at Předmostí-Cemetery Ib. Interestingly, the analyzed large canids from Předmostí I were hunted / killed mainly in the spring to the beginning of the summer or during the summer and only two individuals were caught in the autumn. While wolves from the 2006 excavations were wolves caught / dead throughout the year. The implicatons of these results on the taming and raising of canids will be discussed.

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Upper Paleolithic personal ornaments from Serinyà Caves (Girona, NE Iberia)

Since the end of the XIX century ornamental objects have been recognized as one of the main sources of information on the behavior of Paleolithic hunter-gatherer societies. During last decades, research on personal ornaments has been gaining importance in relation to the study of past societies. Most researchers recognize that ornaments constitute a non-verbal language, they act as transporters of social and personal identity, and the assemblage characteristics reflect social changes and the extension of ethno-linguistic territories.
To face the difficulties of this kind of approximation, since the 90's studies focused on the technology of the ornaments (perforation techniques and suspension systems) have intensified and diversified, applying different techniques of microscopy and relying on experimental programs to test the hypotheses of use and manufacture. These works will serve as both theoretical and methodological bases for this study.

Fig.1: Upper Paleolithic personal ornaments from Serinyà Caves (Girona, NE Iberia).

Until now, most of the evidences from the Upper Paleolithic of northeast Iberia are concentrated in the region of Girona, in a cluster of sites traditionally known as "Serinyà Caves" (Pla de l'Estany, Girona, Spain), which includes the sites of Arbreda, Reclau Viver, Pau and Mollet III. In this communication we present the first approach to the ornamental assemblages recovered in these sites in old excavations and stored in the Banyoles archaeology museum (*Museu Arqueològic Comarcal de Banyoles*). This works provided an ornamental assemblage composed of more than 3000 remains (mainly from Reclau Viver site). Near 20 mollusk taxa have been used for this purpose, being *Homalopoma sanguineum* the most abundant (see figure), as well as canines of *Cervus elaphus, Vulpes vulpes* and *Lynx* sp. to elaborate pendants.
In this study, we propose an approach to the *chaîne opératoire* of the ornaments through the analysis of the raw material provenance and selection, modification, use and discard, contributing to define patterns of the human technological behavior. The study of the discard stage has been based on the breakage patterns and the determination of taphonomic modifications.
The reconstruction of this patterns may allow an approach to the cultural behavior of these societies, as well as to understand the role of personal ornaments as a regional identity marker in northeast Iberia coastline during the Upper Paleolithic. The development of this work will also allow to bring light to important assemblages of Paleolithic ornaments from this geographical area, unpublished and stored since decades ago in the archives of the museums.

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Eleonora Gargani[1], Britt Starkovich[2,3] & Nicholas J. Conard[1,2]
Technological analysis of Magdalenian bone needles from the occupation in the Swabian Jura

The Swabian Jura has some of the most important and well-known prehistoric sites in Europe, attesting to the cultural presence of AMH (anatomically modern humans) during the Upper Paleolithic, as well as Neandertals during the Middle Paleolithic. Several excavation campaigns took place in the region, yielding a wide range of material culture such as faunal remains, lithic tools, human remains, ornaments, and figurines made of bone and ivory. Among the artifacts, archaeologists have recovered a large assemblage of osseous tools from different occupational periods of the sites.
Our poster presents the results of the technological analysis carried out on the assemblage formed by the bone needles and production wastes (n=102) from the Magdalenian layers (around 16.3 – 12.7 cal Kyr BP) of sites located in the Ach Valley (Hohle Fels, Brillenhöhle) and the Lone Valley (Langmahdhalde, Vogelherd). The analysis allowed us to reconstruct the manufacturing processes of this class of tools and to highlight a common technological system and technical skills, shared by Magdalenian groups of hunter-gatherers in the two valleys. The reconstructed production of bone needles provides us with results comparable to coeval European osseous technology.

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Jacopo Gennai & Jürgen Richter

Thinking outside of the taxonomic box

Several Palaeolithic archaeologists are not satisfied with the current cultural taxonomy framework, especially the one established throughout the decades for the Upper Palaeolithic (Hussain and Riede, 2019; Reynolds and Riede, 2019; Scerri, 2019; Shea, 2019). During the last years, due to the renewed interest in the Middle-to-Upper Palaeolithic Transition, we assisted to the revival of the Aurignacian Battle; in particular, lithic technologists disagree about the definition and meaning of cultural entities characterising the first advent of the Levantine and European Upper Palaeolithic: the Early Aurignacian, the Proto-Aurignacian and the Early Ahmarian (Bataille et al., 2019; Dinnis et al., 2019; Falcucci, 2018; Kadowaki et al., 2015). Here we present a research addressing the above-mentioned issues. One of us, J. Gennai, is comparing lithic assemblages from three sites: Fumane Cave, units A2-A1 (Bartolomei et al., 1992), Românești-*Dumbrăvița* I, unit GH3 (Sitlivy et al., 2012) and Al-Ansab 1 (Schyle, 2015). The three assemblages represent the first truly Upper Palaeolithic inventories in their regions, are recognised as *in situ* contexts and have been excavated following modern methods, ensuring the retrieval of the smallest lithic pieces. The first-hand comparison involves representative samples of cores, complete and semi-complete unretouched blanks; the analysis follows the principles of the *chaîne opératoire* approach (Soressi and Geneste, 2011), joined to morpho-technological attributes found diriment in early Upper Palaeolithic lithic technology literature. The removal of any previous taxonomic bias, the use of large comprehensive assemblages (instead of selected artefacts´ categories) and a unified, stated and largely replicable methodology are of particular value for the discussion. Results will be published in a monograph doctoral thesis and the database will be hosted in a free, open access repository (https://crc806db.uni-koeln.de). We hope this will give useful and more solid data for the early Upper Palaeolithic technical behaviour.

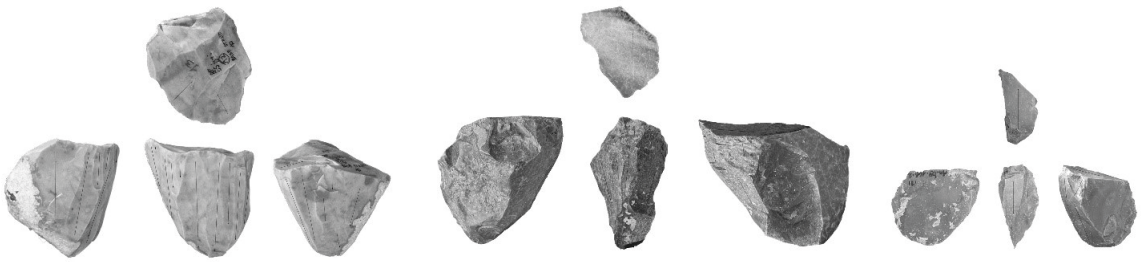

Fig.1: Examples of the three recognised laminar reduction modalities.

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Liane Giemsch[1], Susanne C. Münzel[2] & Ralf W. Schmitz[3]
Sexual symbol or domestic tool? The use of bear *bacula* – an assessment of the archaeological and ethnographical record

The present paper attempts at understanding the background and the possible use of bear *bacula* in stone age contexts. Particular focus is given the *baculum* from the Late Palaeolithic site of Bonn-Oberkassel. In order to allow for a more general interpretation of such finds, their meaning and symbolism, we compare the Palaeolithic evidence with ethnographic contexts. The assessment implies that the use of bear *bacula* by humans developed from their use as tools, such as in the Gravettian layer of Brillenhöhle (Blaubeuren, Swabian Jura) towards symbolically charged objects, which is for the first time strikingly documented in the burial context of the Late Palaeolithic site of Bonn-Oberkassel, but also in the extraordinary grave goods of the Siberian burial place of Shamanka II. While at Shamanka II the *os penis* was mainly used as a grave good for adult males, indigenous Siberian hunter-gatherer groups tend to see it as a symbol to enhance female fertility. In conclusion, the *baculum* is generally seen as a symbol for the strength and power of the owner by wearing or using it.

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Fig.1: Decorated baculum from the Gravettian layer AH VII in Brillenhöhle (Foto: WLM).

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Middle Paleolithic technological organization and land use in Armenia, a preliminary synthesis

In Armenia, the increasing number of excavated and chronometrically dated Middle Paleolithic (MP) localities is broadening our view of Late Pleistocene hunter-gatherer settlement dynamics (Marine Isotope Stage [MIS] 3; ~ 60 – 30 ka). This poster summarizes results of ongoing research at several MP sites in a range of contexts to assess variability in patterns of artifact discard and tool stone raw-material provisioning – indicators of hunter-gatherer mobility and land-use. With few exceptions, caves tend to preserve dense archaeological accumulations, including biotic remains and evidence of stone artifact manufacture, maintenance, and discard. Open-air sites on the other hand, show wide variation in depositional contexts and preservation, and artifact densities and discard patterns. This preliminary synthesis identifies differential use of variable topographic and eco-geographic settings, exploitation of major obsidian, dacite, flint, and other toolstones, with overlapping obsidian artifact transports among sites, and relative technological homogeneity throughout much of the documented MP. Presently, artifact assemblage data suggest the presence of frequently

re-occupied, and ephemerally occupied localities. Late Pleistocene hunter-gatherers were thus well adapted to the rugged and eco-geographically diverse landscapes of Armenia. To increase the spatio-temporal resolution of regional land use behaviors and settlement dynamics, and better understand regional geomorphological factors impacting the preservation of Paleolithic sites, more chronologically controlled behavioral, paleo-environmental, and geological data are needed from both cave and open-air sites.

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Liubov V. Golovanova[1], Vladimir B. Doronichev[1] & Andrey G. Nedomolkin[2,1]
Beyond the Gravettian: the Late Upper Palaeolithic industry of the NW Caucasus during early MIS 2, from 30 to 20 ka ago

Modern research indicates that the 'classic' definition of Gravettian tradition is applicable to only a limited area, which includes the type site of La Gravette in France (Djindjian, 2011). As a result, the terms 'Gravettian tradition' or 'Gravettian culture' are replaced now by wider definitions such as the 'Gravettian complex' or 'Gravettian techno-complex'. According to a modern conception, Gravettian is a complex of numerous related, geographically localized archaeological cultures or lithic industries that is restricted to Europe and represents the most significant archaeological industry characterizing the middle stage of the European Upper Palaeolithic, between ca. 37 and 20 ka ago (Kozlowski, 2015; Reynolds et al., 2015; Bicho et al., 2017). Research in the Caucasus and Levant show that both Gravette points and backed bladelets, which are considered as tool types typical to the Gravettian, have much wider spread than the spatial dissemination of the Gravettian complex. Modern archaeological data from both the North and South Caucasus clearly indicate that the Caucasian Upper Palaeolithic industry does not represent a variant of either Aurignatian or Gravettian. The origin of the Caucasus Upper Palaeolithic is clearly related with the Near East. In the time immediately before and during the Last Glacial Maximum, from 30 to 20 ka ago, a significant number of cultural innovations in stone and organic inventories define a high cultural originality of the Caucasus Late Upper Palaeolithic industry in comparison with the neighbouring regions in Europe and West Asia (Golovanova and Doronichev, 2020). On the basis of data from Mezmaiskaya cave and supporting evidence from other sites in the NW Caucasus, we discuss the genesis and peculiarities of the Caucasus Late Upper Palaeolithic industry.

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Liubov V. Golovanova, Ekaterina V. Doronicheva & Vladimir B. Doronichev
Geometric microliths in the Epipalaeolithic in the North Caucasus

Research over the past 20 years has shown the early appearance of geometric microliths (ca. 25-24 ka cal BP in Satsurblia cave) in the South Caucasus. In the North Caucasus, the earliest occurrence of geometric microliths is known in the lower horizons of layer 1-3 at Mezmaiskaya cave (ca. 17 ka cal BP), in the North-West Caucasus (Golovanova and Doronichev, 2020), and in layer 8 at Sosruko rockshelter (ca. 15 ka cal BP), in the North-Central Caucasus. The Epipalaeolithic assemblages of the North Caucasus are characterised by a marked development in the manufacture of geometric microliths from the beginning to the final of Epipalaeolithic in the region. The most indicative change is the increase in both the percentage (among the total tools) and number of geometric microliths from the earlier to later assemblages: from ~7-5% in the lower horizons 4-9 of layer 1-3 at Mezmaiskaya cave and layers 8 and 7 at Sosruko rockshelter, which are dated from the Late Glacial, to 13-16% in the upper horizons 1-3 of layer 1-3 at Mezmaiskaya and layer 2 at Psytuaje rockshelter in the North-Central Caucasus, which are dated from the Younger Dryas and the Pleistocene–Holocene boundary.

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Traceological analysis of backed points from the dry Plateau of Dhofar reveals insights into South Arabian Upper Paleolithic projectile technology

Projectile technology refers to launched weapons propelled by physical strength, that may have its range and speed augmented by mechanical force using specifically developed launching systems, with the intent to kill or wound a target. The significance of this technology to the evolution of our species, the chrono/cultural variability, geographical distribution as well as the impact it made and still makes on archaeological interpretations are the subjects of many scientific articles and books.
Here, we focus on the stone insets attached to the wooden shaft that serves as the projectile. One of the reasons for focusing on the stone insets is their durability in comparison with most archaeological organic remains. In South Arabia, these prehistoric stone insets show great morphological variability throughout the Stone Age (Paleolithic) and reach their absolute peak in display of skill and craftsmanship during the Neolithic. This variability is a result of how points were hafted, shot, weather made from organic and inorganic material, as well as from a vast array of social factors. In order to reconstruct how the backed points from the Upper Palaeolithic site of Mutafah 1 dated to ap. 30,000 years ago were made and to ascertain their function we made use of the traceological method which aims at detecting the micro- and macro-traces of production and use of any given artefact. The results of the analysis shows these arched backed points to be used in at least two different activities, hafted as projectile points and likely used during hunting as well as in transformative/productive activities, showing them to be part of a mobile toolkit. This versatility in use demonstrates how stone tools that look the same and were manufactured with the same specific technical system may present different functional applications.

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Upper Palaeolithic site complex near Moravany nad Váhom (Slovakia): old story, new challenges

The site complex between Modrovka and Sokolovce centred in Moravany nad Váhom near the town Piešťany (Western Slovakia) is known as „Moravany settlement area". It consits in a quite short time span between the Early-Upper (Szeletian) and Mid-Upper Palaeolithic (Gravettian) also with indeterminate Upper Palaeolithic spots. The sites are distributed on more than 50 separated localities concentrated along 12 km long area of the left bank of the Váh river. Beginnings of the research in the Moravany area date of the first half of the XX century. It literally attracted the notorious Palaeolithic specialists of Central-Europe. Nevertheless, for various reasons, none of them succeeded to achieve long-lasting researches or to unify research methodology or reunite scattered collections. Most of those have often been irretrievably splitted up or lost.
Thus, the old "documentation puzzle" has to be put in order to set new favourable research conditions. Currently, we dispose of the data, provided by archaeologists L. Zotz, K. Absolon, F. Prošek, J. Bárta, J. Hromada and Ľ. Kaminská with K. Sobczyk and J. Kozlowski, that constitute the main solid basis for further research in Moravany. In our project developed since 2014, several key lithic and bone assemblages (Dlhá, Podkovica, Lopata I and II) from the old excavations are under re-examination and new field investigations have started. Some sites are partially damaged by natural and anthropic post-depositional procecsses. However some old classical sites show promising conditions. Current data about the sites reflects, that Moravany complex is formed by several cultural stages of different sites of open-air occupations. First stage of occupation is related to the period of transition of Szeletian in the Western Carpathians. The second occupation phase clearly identified in the region corresponds to the pre or initial stages of LGM and is connected to the arrival of population closely associated with Gravettian techno-complex (late or final Gravettian) and maybe Epigravettian. Perhaps, the high density of the Palaeolithic occupations in this micro-region resulted from favourable climatic conditions more stable as the area counts numerous geothermal springs. This seems to be an important factor of the settlement strategy of these Prehistoric human groups.
The aim of the communication is to present : 1/some results of the analyse the assemblages according to the modern methods and 2/ the first results of new field work and observations, including the geochronological survey. An upcoming planned multidisciplinary field work in some stations (Podkovica, Dlhá) is aiming to re-discuss the taxonomic and stratigraphic position of the cultural and geological layers.

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Firas Jabbour[1], Boris Gasparyan[2] & Andrew W. Kandel[3]
Spotlight on AH IIId, the main Upper Paleolithic occupation of Aghitu-3 Cave, Armenia

This paper presents the results of a study of the Upper Paleolithic stone artifacts from Aghitu-3 Cave, which is situated at an elevation of 1601 m along the Vorotan River, Syunik Province, southern Armenia. The study forms part of a dissertation project funded by the Gerda Henkel Foundation and focuses on the richest archaeological horizon (AH) IIId dated between about 29,000 and 28,000 cal BP.
To understand people's lives and activities at Aghitu-3, we studied 4457 stone artifacts from AH IIId. These represent almost half of the assemblage from all layers at Aghitu-3. Obsidian dominates the assemblage of AH IIId with 86%, followed by 13% chert. The remaining artifacts (less than 1%) consist of dacite. The most frequent sources of obsidian are located 30-40 km from the site, while some varieties come from as far as 250 km away.
The people who inhabited Aghitu-3 did not show a preference for raw materials of specific shapes. We believe they collected rocks expediently in order to knap cores into rectangular and semi-round shapes during the reduction process. The study of the cores of AH IIId (n=56) reveals that people prepared four types of cores mainly oriented towards the production of bladelets: 1) cortical cores, 2) burin-like cores, 3) thick flake cores, and 4) pyramidal cores. We note that these cores are usually small and exhausted when compared to the older layers of the site (e.g. AH VII, AH VI.1 and AH VI.0) dated between 39,000 and 32,000 cal BP.
Once people set up a core, they focused almost exclusively on the extraction of laminar blanks. Bladelets, defined as elongated blanks and width <10 mm, represent just 28% of the blanks, but 68% of the tools. Diversity is the most interesting feature of AH IIId with 572 tools divided into eleven categories.
Laterally retouched and backed bladelets are the most common tools in AH IIId, representing 58% of the tools. We assume they were used mainly as cutting inserts. They are mostly translucent obsidian with dorsal retouch. Some bladelets and blades have complete or partial retouch on both laterals to create specialized tools such as laterally retouched and backed points.
Burins in Aghitu-3 are an important category of tool. Many of the burins can be described as simple, without prior preparation. We also find examples of Noailles burins in about half of the burin assemblage. While we hesitate using cultural attributes from other regions, this technique precisely describes this type of burin. The remaining types of tools in AH IIId include retouched bladelets, retouched flakes, end and side scrapers, notches, denticulates, drills, combination tools and splintered pieces. Unique artifacts found in AH IIId, demonstrate various skills. For example, a broken eyed bone needle suggests the knowledge of sewing technologies, likely used in the manufacture of complex clothing and accompanied by other materials such as leather and string. In addition, shell beads were used as ornaments, perhaps denoting private property or group identity. We also draw attention to a large number of animal bones, some of which have clear cut marks and impact fractures. The evidence suggests that people hunted and transported wild sheep, wild goat and equids to the cave.
AH IIId provides insight into the behavior of the groups of people who lived at Aghitu before the Last Glacial Maximum. The variety of tools and their different uses and techniques tell us a lot about their lives. People occupied the cave for longer periods compared to the other layers. They picked up their raw materials and processed them efficiently. They preferred laminar debitage for producing tools such as knives, burins, scrapers, denticulates and drills, which we hypothesize they used for cutting, piercing, slicing and working on animal as well as plant remains.
The quantity of material discovered and many types of activities indicate that people used the cave for longer durations. The various sources of raw materials (obsidian and shell) indicate either long distance movement or exchange. We suggest that the cave was used as a seasonal camp due to its privileged location along the Vorotan valley corridor which provided access to ample resources.

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Kožený Zámek: Archaeological and Paleoecological Insight from a Late Paleolithic site in Kokořínsko, Central Bohemia

Understandings of landscape use and environmental practice during the Late Paleolithic and Mesolithic of Central Europe are complicated by several geographical gaps in knowledge. One under-studied area is the regions adjacent to the Elbe corridor that would have connected Bohemia to a dynamic and changing world during the post-glacial transformation of Europe. Since 2017, we have been conducting systematic survey, which has identified several important sites in Kokořínsko – a landscape which drains into the Elbe river near to its confluence with the Vltava. In this paper, we present results from the excavation of Kožený zámek, a key site that we identified during this work, and analyzed through collaborative archaeological and paleoecological perspectives. The site is a well stratified rock shelter located in an enclosed valley and has occupations that span the Modern period to the Late Paleolithic. In our presentation, we focus on stratigraphic interpretations and C14 dating of a series of superimposed hearth features that date from about 9800-10,800 cal BC. Analysis of lithic, malacozoological and archaeozoological collections from these layers at Kožený zámek offer a rare glimpse into local practice and environmental changes during the Pleistocene/Holocene transition. Late Paleolithic contexts are quite rare in Bohemia. From a regional perspective, we consider the insight that Kožený zámek offers for questions of continuity between Late Upper Paleolithic and Mesolithic in Central Europe.

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Alena Kharevich (Shalagina)[1],Vladimir Kharevich[1], Sergei Markin[1], Victor Chabai[2] & Kseniya Kolobova[1]
The relationship between core and bifacial flaking in Chagyrskaya Cave assemblage (Altai Mountains): Experimental data

The difference between Sibiryachikha variant of Altai Middle Paleolithic (Derevianko et al. 2013) and other lithic assemblages of Altai Middle Paleolithic is the prevalence of radial and orthogonal core-reduction, the absence of Levallois technique and specific tool-kit, which includes *déjeté* scrapers, simple backed scrapers, retouched points. The most significant characteristic of Sibiryachikha variant is the presence of plano-convex bifacial tools (Kolobova et al. 2019).
According to the technological analysis results and experimental modeling of Sibiryachikha plano-convex bifaces the following technological sequences are observed: the shaping of the flat surface, the shaping of the convex surface and the edge shaping.

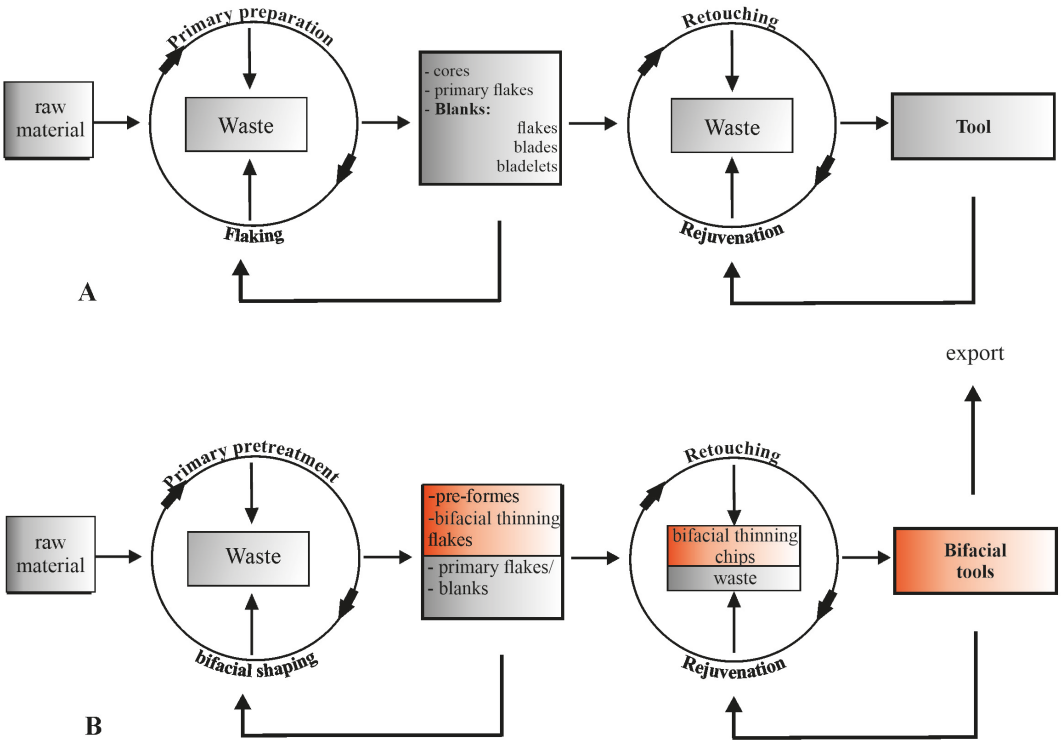

Fig.1: The comparison of core and bifacial flaking in Chagyrskaya Cave assemblage: A – core flaking (modified after Debenath, Dibble 1994); B – bifacial flaking.

The analysis of the debris, obtained from each stage of flaking has shown that the most characteristic are the chips resulting from the retouching. They are characterized by following technological attributes: faceted or flat heavily canted striking platform, the presence of small removals on the dorsal surface, diffused bulb and the presence of lip. Such set of attributes characteristic for the bifacial thinning flakes (Chabai, Demidenko 1998).
The experimental modeling of radial and orthogonal core-reduction flaking made possible to determine the general technical spalls types of each particular method. Among the experimental technical spalls debordant radial cortical flakes, debordant radial flakes, debordant cortical flakes, semi-crested flakes and technical flakes were identified. The comparison of experimental bifacial chips and products of core-reduction flaking from Chagyrskaya Cave archeological assemblage (layer 6c2) has shown the prevalence of core-reduction over the bifacial manufacture. The comparison of numerous bifacial tools and bifacial chips from archaeological assemblage has shown that active tool rejuvenation process took place in this area. The sizes of primary experimental and archeological flakes suggest that decortication process took place outside the cave, possible at river bank.

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Arina Khatsenovich & Evgeny Rybin
Upper Paleolithic bladelet and microblade production in Mongolia

The origin of pressure microblade production in Asia was controversial since this problem became an important for understanding evolution of lithic technology and human subsistence strategies. Sporadically found early cores for pressure microblade production are the weak evidence of micropressure, as well as early appearance of percussion microblade production does not prove its connection with later pressure technology. Some research consider Mongolia as a possible place of micropressure origin. Production of the small laminar blanks here has a long history and evolution. We consider this evolution to understand the connections or disconnections between different small blade technologies. Bladelet production in the lithic industries appears in Initial Upper Paleolithic complexes ca. 45 – 40 cal. ka in Mongolia. Core types reflect an intentional bladelet production, independent from blade production. The type of the most numerous cores, aimed to bladelet production, is narrow-faced. Another type represents the series of small flat short cores with one or two striking platforms. This type of cores has rectangular shape and flat cross-section. It was an independent reductional method, because a number of them were left on the initial stage of utilization, with cortex on the flaking surface. The other type is subprismatic / prismatic circular-shaped cores with single or two opposite striking platforms, close to so-called "barrel-shaped" cores. The most remarkable type of bladelet nuclei is burin-core. Carinated cores are very few. Appeared in Northern Mongolia about 38000 BP, this type made a fleeting appearance in later complexes of Tolbor group. Some of carinated cores were retouched on the final stage of its utilization. Retouch is situated on the platform edge, forming the working edge of high end-scraper. Most of these types, except burin-cores, can be found in the Early Upper Paleolithic industries in Northern Mongolia. In the end of this period remarkable tool types appeared in Northern Mongolia – geometric microliths, presented by segments and trapezes. Approximate age of these complexes falls within a range from 30 to 18 cal. ka. They were replaced by complexes with pressure microblade production. Taking into account the chronological gaps between the time being of these technologies, high diversity of technologies, as well as poor presentation of pressure microblade technology, it seems that Mongolia was the transitional territory for multiple populations with different technologies. It is controversial issue that any of those technologies originated in this region.

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Kseniya Kolobova, Vladimir Kharevich, Alena Shalagina, Pavel Chistyakov & Andrei Krivoshapkin
New approaches to the study of Middle Paleolithic bone retouchers

Here, we apply several new methods mostly based on 3D modelling to the study of Middle Paleolithic bone retouchers from Chagyrskaya Cave.
Active area modelling and cross-sections of diagnostic traces in the active areas underwent signifi cant changes: whereas at the early stages they reveal "furrows" with V-shaped cross-sections, multiple blows against the processed lithic resulted in the deformation of the original form, which eventually resembled an upturned trapeze.
High resolution metrical dimensions demonstrate a high standardization of blanks, indicating the intentional selectivity of Neanderthals. Selection also concerned animal species and the anatomical positions of bones. We found that morphological characteristics such as the number of active areas and the degree of their modification did not affect the size of the retouchers and attest only to the reorientation of tools during lithic processing. The comparison of bone retouchers from several multicultural Middle Paleolithic complexes in Eurasia (Chagyrskaya and Denisova caves in the Altai, Kabazi V site in the Crimea, and Barakayevskaya Cave in the Caucasus) evidences similar proportions but considerable variation in size.

Proportions, then, are an inherent functional characteristic of bone retouchers, which does not depend on either the cultural context or the raw material base. 3D geometric-morphometric shape analysis to Middle Paleolithic bone retouchers from Chagyrskaya Cave indicates that the anatomical origin of bone blanks does not significantly influence the retouchers' shape, which may point to strict blank selection and, at the same time, intentional modification. Our results raise questions regarding the integration of retouchers into a complex, multidimensional "chaine-opératoire" as well as the nature of Neanderthal cognitive abilities. Geometric-morphometric shape analysis represents a major step forward in the study of prehistoric retouchers.
We conducted the first studies of experimental and Middle Paleolithic retouchers with their subsequent three-dimensional modeling to study the method of retouching and the gesture used. Our preliminary results suggest that Neanderthals from Chagyrskaya cave held retouchers while working with the entire hand.

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Małgorzata Kot[1], Katarzyna Pyżewicz[1], Damian Stefański[2] & Paweł Valde-Nowak[3]
Truncated faceted technology in Ciemna cave, Polish Jura

Ciemna cave is one of the most prominent Late Middle Palaeolithic sites in Poland. The cave is situated in the Koronna rock, 80m above Prądnik Valley. The site consists of three parts. One of them is a cave itself. The second called Ogrójec is a rockshelter situated on the other side of the „Rękawica" rock. The third part, called Oborzysko Wielkie, is a terrace located between the cave and Ogrójec rockshelter with a good view on the valley.
The majority of Middle Palaeolithic occupation was concentrated in Oborzysko Wielkie, which was excavated in 1918-19 by Stefan Krukowski and then in 60-ties by S. Kowalski. Unfortunately, the whole assemblage collected by Krukowski was never fully published, and it is still stored in the State Archaeological Museum in Warsaw. Recently a new fieldwork project has been conducted inside the cave in order to determine the detailed stratigraphy and collect paleoenvironmental data.
Ciemna Cave is well known especially due to the presence of a specific type of Keilmesser production, called „Prądnik technique", which aimed at preparation of the near the tip part of the working edge, by a detachment of the elongated spall called „Prądnik spall". As a result, a Keilmesser with a sharp edge was obtained. Later on, it could be rejuvenated subsequently with the use of further „Prądnik spalls" detachments. Krukowski was the first to determine the specific „prądnik technique within the Ciemna assemblage. He also mentioned in his first detailed site description in 1939-1948, a presence of small „knives" made mostly on flakes, with minor bifacial shaping. He called them „Prądniczak" due to their distinct morphometry.
The recent study aims to reevaluate the technology of production of this particular type of tools. Small artefacts with traces of bifacial shaping were analysed with the use of scar pattern analysis in order to test to which extent they represent a simmilar knapping concept to the fully bifacially shaped „Prądnik type„ Keilmessers. Additionally, traseological analyses were conducted on both types of artefacts i.e. „Prądnik type" Keilmessers and so-called „Prądniczaks", in order to determine if one can see a difference in a function for these two groups of artefacts.

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The Lower Paleolithic site of Bilzingsleben – new insights into chronology and site formation

The Lower Paleolithic open air site of Bilzingsleben, located in Thuringia (Germany), was discovered in the beginning of the 20th century when geologists and paleontologists reported the exposure of Pleistocene animal bones and Nordic flints at the site. After the unearthing of the first human fossils in the 1970s, the site was recognized as one of the most important central European sites for the study of early humans. Since then, multi-disciplinary investigations have been carried out in order to gain insights into the site formation, the stone artefact assemblage as well as the faunal remains and palaeoenvironment (Mania and Mania, 2005, Bock et al 2017, Brasser 2017; Müller and Pasda, 2011; Pasda 2012).
One of the critical issues, highly debated, is the radiometric age of the site, as well as the deposition and formation of the travertine sands which contain the bones and flints. Stratigraphically, the sediments clearly post-date the Elsterian glacial cycle and should correspond to a Middle Pleistocene interglacial, likely either MIS 11 or MIS 9. However the exact chronological position remained unclear. We therefore conducted further radiometric dating at Bilzingsleben using luminescence- and infrared-radiofluorescence dating on K-feldspar from the travertine sands, in combination with amino acid analysis on four individual *Bithynia tentaculata* opercula. To clarify the depositional context, we performed micromorphological analyses and studied distribution patterns in the archaeological assemblage.
The results obtained from the optical dating (to around 340 and 370 ka) point to deposition of the find-bearing sands prior to MIS 9. We regard these ages as minimum ages due to reworking of the dated sediments. In combination with the amino acid geochronology, our investigation lends further support to a MIS 11 age for Bilzingsleben.

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The archaeology of Istállóskő Cave, Bükk Mountains, Northeast Hungary

Anatomically modern humans (AMH) arrived some 45 thousand years ago (hereafter abbreviated kya that means calendric ages) to the Western Carpathians. Immediately after their arrival, AMH started conquering the territories of the Neanderthals, and in a short period of time they occupied the complete Western Eurasia (Finlayson, 2004). The first AMH culture is believed to be the Bohunician dated to between 45 and 40 kya (Škrdla, 2017), but Bohunician findings have not yet been found associated with human remains. Therefore, the unquestionably first AMH culture in Central Europe was the Aurignacian with its two chronological phases, the Early and the Evolved Aurignacian (Svoboda, 2006; Hublin, 2015; Chu, 2018).
The Western Carpathians has only a few caves that preserved Aurignacian remains, including faunal, botanical, anthropological, artistical and lithic and osseous artifact assemblages. Although caves offer a higher chance for organic preservation, they were often subjected to post-depositional admixture. In addition to this, most known caves in the area were almost fully excavated in the early and mid 20th century with field methods that were of significantly lower quality than required today (Svoboda, 2003).
The only archaeological site in the Western Carpathians with both the Early and Evolved Aurignacian occupations, where Mladeč points overlay split base points, and the sediments yielded faunal remains including large and micromammals, botanical finds, a human remain,

and artistic objects in a secure stratigraphy is Istállóskő Cave in the Bükk Mountains, in the northeast Hungary (Vértes, 1955). Istállóskő Cave is situated in the western Bükk Mountains of Northeast Hungary (N48° 04' 17,88"; E20° 25' 03,62"). The entrance is 10 m wide and 7.5 m high today, and the cave is 57 m long with a ceiling 16 m maximum height. The cave entrance opens at 546 m asl 93 m above the valley bottom of stream Szalajka. It has a long research history that started in 1912 (Vörös 2003-2004). Excavations before 1947 were poorly documented, and Vértes (1955) recovered a succession of two Aurignacian levels between 1947 and 1951. Vértes (1955) named the lower cultural level Aurignacian I and the upper one Aurignacian II. Since then, only a short-term field work was carried out in the 2000s, which partially managed to refine the site 14C chronology (Adams and Ringer, 2004; Davies and Hedges, 2008-2009).
The lower level yielded over a hundred osseous tool items both complete and fragmented, and fewer lithic remains. The split base osseous point was the prime character of this assemblage, and some of the specimens were dated to 40-37 kya (Davies and Hedges 2008-2009). This age is identical to that obtained for Dzeravá skala Early Aurignacian split base point (Davies and Hedges, 2005).
In the upper level, the number of osseous tools dwindled, but the lithics were more numerous. Mladeč points characterized this osseous industry. Also, a modern human child tooth (permanent molar) (Malán, 1955) and a hearth of 3 m diameter was found was found in the upper level. The 14C measurements showed this occupation is 32.5-34.5 kya old (Davies and Hedges, 2008-2009). This age is comparable with most of the Mladeč point yielding sites such as Mladeč Cave in Moravia (Wild et al., 2006) or Potočka zijalka in Slovenia (Moreau et al., 2015), except the Mamutowa specimens (Wojtal, 2007).
The available Istállóskő material was studied several times, but due to the excavation method of Vértes (no piece plotting, no sediment sieving), the results of every study on this material leaves several questions open. For instance:

1) Vértes (1955) described two Aurignacian occupations, but lately this classification was denied with the upper layer in relation with the Gravettian, and the lower layer in relation with the Late Middle Palaeolithic Jankovichian (Markó, 2015, 2017).
2) Vértes (1955) mentions that finds of the upper archaeological level were found solely in the uppermost portion of the over 1 m thick dark brown layer of the cave. However, animal remains were found all over the layer and the relation between the faunal assemblage of the dark brown layer and the artifact level remained unclear.
3) The same holds for any other faunal and botanical study on the sequence, especially in the case of the charcoal remains (Sárkány and Stieber, 1955).

This paper presents a new excavation carried out in 2020, which aimed at collecting archaeological evidences from the site to clarify the human occupations of Istállóskő Cave.

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Gonzalo Linares Matás, Norman Fernández Ruiz, María Haber Uriarte, Mariano López Martínez, Antonio López Jiménez & Michael Walker

Sharing shelter: hyaenas and early humans in the late Early Pleistocene Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain)

Throughout the Pleistocene, early humans and carnivores frequented caves and large rock-shelters, usually generating bone accumulations. The well-preserved late Early Pleistocene sedimentary sequence at Cueva Negra del Estrecho del Río Quípar (CNERQ) has provided substantial evidence concerning the behavioural and adaptive skills of early humans, such as the use of fire, whilst also bearing witness to the bone-altering activities of carnivores (Walker et al. 2020; Linares-Matás et al. 2017).
CNERQ is a large, north-facing rock-shelter in the Río Quípar gorge, 10 km south of Caravaca de la Cruz, Murcia, SE Spain. The fundamentally uniform, homogeneous nature of the Cueva Negra sedimentary sequence is the outcome of low-energy fluviatile transport that led to no more that scanty horizontal displacement of finds, and is attributed to sporadical, perhaps seasonal, overflow of a swampy lake, beside the rock-shelter. Palaeomagnetic reverse polarity throughout the 5-m depth of sedimentary deposits (Scott & Gibert 2009), micromammalian biostratigraphy (López-Jiménez et al. 2020), and ESR-dating (Walker et al., 2019; Walker et al., 2020)

Fig.1: Cueva Negra del Estrecho del Rio Quipar, Late Early Pleistocene sedimentary sequence and bones.

indicate a late Early Pleistocene age somewhere between the end of the Jaramillo sub-chron (ca. 0.99 Ma) and the Matuyama-Brunhes boundary (ca. 0.772 Ma). Temperate environmental conditions have been inferred from palaeoenvironmental studies, which would be compatible with interglacial climates during MIS-19 (prior to the palaeomagnetic boundary) or MIS-21. It therefore bears comparison with the age of Atapuerca TD-6 / Burgos, Spain (Duval et al. 2018). Recent fieldwork has allowed the re-examination of the spatial and taphonomical nature of the macrofaunal assemblage from the upper Complex 2 (representing ~30cm of internally-homogeneous stratigraphic depth). This last phase of sedimentary accumulation encompasses a truncated alluvial sequence with low porosity and good sedimentary organisation that reflects mainly low- and occasionally medium-energy dynamics (Angelucci et al. 2013). The highly-fragmented bone assemblage (n = ~1,700) reflects an attritional skeletal profile and it is dominated by medium- and large-size mammals, including several *Megaloceros novocarthaginiensis* antlers. The identification of several juvenile *Crocuta* sp. remains alongside coprolites and tooth-marked bones indicates the sporadical presence of a hyaena den. Furthermore, the presence of axial and upper appendicular bones with percussion and cut-marks near to several hammerstones suggests a clear albeit limited anthropogenic input. The abundance of dry fractures and the presence of weathering and rodent gnawing in the upper levels of Complex 2 of Cueva Negra are in stark contrast to the pattern found in other levels. Slower sedimentation rates, alongside some degree of bioturbation detected at the micromorphological level (Angelucci et al. 2013) compatible with the burrowing activities of hyaenas in their dens, likely favoured the generation of an archaeological palimpsest.
We interpret the available taphonomical and spatial evidence from these layers as reflecting a dual-patterned palimpsest, likely derives from the alternating use of the site by early humans and hyaenas for shelter during their hunting or breeding seasons in the Quípar valley landscape during the final phase of sedimentation preserved at CNERQ. Moreover, hyaenas and humans likely were in quasi-simultaneous coexistence with other small predators, which were responsible for the accumulation of the micromammal, avian, and herpetological elements.

The spread of social hunters, such as *Crocuta sp*. and *Homo sp*., during the final stages of the Early Pleistocene correlates with the decline of late Villafranchian solitary hypercarnivores and large scavengers in Western Europe, such as the sabre-toothed *Megantereon whitei*, the Pleistocene Eurasian jaguar *(Panthera gombaszoegensis)*, and the large hyaenid *Pachycrocuta brevirostris*. Therefore, the archaeological sequence of CNERQ has relevant implications for understanding the biogeographical configuration of the late Early Pleistocene landscapes of south-western Europe.

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Florian Linsel

The Petrification of the Fractal Dimension

The investigation of scar patterns on the surface of stone tools in the past showed that these features are present due to the three main phases of preparation - decortication, shaping and sharpening. The central assumption of this research is that these structural patterns of scars could potentially behave like fractals. The extracted fractal distributions could be further described by the Fractal- (Hausdorff-) Dimension. One of the foundational works in this field was the article "The Fractal Dimensions of Lithic Reduction" written by BROWN (2001). Brown focused on the debitage classification of several sites in the area of *Wetherington Island Site*. Brown classified size-frequency distributions of the according to their Fractal Dimension. Not only was he able to distinguish the three phases of reduction but also the sophistication included in the technic applied on the site, which he named the stage of reduction. For analysing the Fractal Dimension potentially enclosed in Lower and Middle Palaeolithic artefacts, a Python Code for image analysis is developed. In using a DEM of the surface of each artefact, the maximum curvature is calculated. The spatial data is transferred from the curvature map into the area of drawn scar areas. The distribution of this parameter was extracted and tested whether its characteristics behave fractally.

Additionally to the Fractal Dimension, this research will include a 2.5-dimensional version of the scar density index SDI (CLARKSON 2013) and introduce the fractal dimension density (FDD) in comparison to that parameter. This research was conducted to evaluate the Fractal Dimension to representing the technical sophistication implied in the production system creating the artefacts and how these systems were restricted by their raw material.

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Elisa Luzi[1], Sara E. Rhodes[2] & Nicholas J. Conard[2]
Paleoenvironmental and paleoclimatic context of the Middle Paleolithic occupations of Hohle Fels inferred from the small-mammal assemblages.

Hohle Fels cave (48°22’45’’N E9°45’14’’E) is located in the Ach Valley (Southern Germany), at 534 m a.s.l. The excavations exposed a ca. 5m-thick sequence, spanning from the Middle Paleolithic to the Magdalenian. The site yielded abundant lithic and faunal remains but it is especially renowned for the symbolic artifacts (such as ivory animal and human figurines, personal ornaments, and musical instruments) recovered in the Aurignacian levels
We present here the preliminary results from the study of the small-mammal assemblage of Geological Horizons (GH) 14 to 9, assigned to the Middle Paleolithic. Using small mammals as proxy, we reconstructed the paleoenvironmental conditions in the surroundings of the site and distinguished changes in climatic conditions during the Neanderthal occupations.
The assemblage is extremely rich, and it was possible to identify 21 small mammal *taxa* (8 Insectivores, 1 Bat and 12 Rodents). Applying the Habitat Weighting Method and considering changes in the presence-absence of species and their relative representation throughout the sequence, it was possible to recognize 4 different climatic phases. GH 14 and 13 represent a relatively warm and humid phase, testified by the strong presence of water-related *taxa*, and characterized by dominant temperate grasslands. It is followed by a cold and arid period at GH 12, with a decrease in forest and water components and a higher percentage of lemmings, indicators of tundra and subarctic conditions. At GH 11 it is possible to observe a temperate but relatively arid oscillations, with temperate grasslands still dominant, but a strong increase in shrublands and woodlands. In the last phase, GH 10 and 9, the climate became increasingly cold and arid, with an expansion of tundra and subarctic grasslands.
Although varying in intensity, the repeated occupation of the cave in all the different phases that we have identified confirms the frequent presence of Neanderthal groups in the Ach Valley, even during periods of harsh environmental and climatic conditions.

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Mario Mata-González[1], Britt M. Starkovich[1,2], Mohsen Zeidi[2,3] & Nicholas J. Conard[2,3]
Animal Exploitation during the Middle Paleolithic at Ghar-e Boof (Southern Zagros Mountains, Iran)

Ghar-e Boof, a cave site located in the Dasht-e Rostam region (Fars Province, Iran), represents a key locality for understanding human behavior and cultural diversity in the Zagros Mountains during the Early Upper Paleolithic (UP)-Rostamian (42-35 ka cal. BP). Recent excavations carried out by the Tübingen-Iranian Stone Age Research Project (TISARP) at Ghar-e Boof not only achieved higher stratigraphic resolution of the UP horizons, but confirmed the use of the site during the Middle Paleolithic (MP). Based on optically stimulated luminescence, the MP horizons yielded dates between 45-81 ka (68% CI). Along with the lithic assemblages, we recovered numerous faunal remains, which can provide new information regarding human diet and subsistence strategies during the MP in Southwest Asia.
Here, we present the preliminary results of a zooarchaeological analysis of the MP faunal assemblage of Ghar-e Boof. Overall, carnivore gnawing is quite rare, and the presence of tool marks (cut-marks and percussion impacts) and burned bones demonstrate that humans were the main agent of bone accumulation. The primary prey at Ghar-e Boof was sheep/goat, though gazelle, wild boar, horse and wild cattle were also part of the human diet. Cut-marks have also been observed on tortoise, bird and carnivore remains. Most likely hunting carnivores, birds and tortoises was of secondary importance in comparison to caprines and other ungulates. Nonetheless, our results highlight that the MP human animal exploitation in the Zagros Mountains was more diverse than previously thought.

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Ondřej Mlejnek[1], Ladislav Nejman[2], Miriam Nývltová Fišáková[3], Petr Škrdla[3] & Lenka Lisá[4]
Multidisciplinary research at Švédův stůl Cave in the Moravian Karst

This contribution introduces a Czech-Australian project re-excavating Švédův stůl Cave in the southern part of the Moravian Karst (Czech Republic). This cave became well-known after the so-called Ochoz Neanderthal mandible (*Unterkiefer von Ochos*) was discovered there in 1905 by student Karl Kubasek and was published the following year by Brno professor Anton Rzehak. Martin Kříž conducted excavations inside the cave in 1886-1887 and Bohuslav Klíma in 1953-1955. We were recently able to examine Klíma's original documentation and this has helped our interpretations.

The biologist Jaromír Vaňura conducted more research in this cave and his daughter discovered a Neanderthal molar in the discarded sediment outside the cave.
On 28. 8. - 13. 9. 2019 we conducted a new excavation outside the cave entrance. One test pit targetted the spoil heap from previous excavations and a second test pit extending from the cave entrance towards the spoil heap targetted an area of possible intact sediments. All sediments were wet-sieved using 2 mm sieves. In 2020 we continued with the excavation of the spoil heap.
It is clear that the the previous excavations did not remove all of the intact sediments outside the cave. Devonian limestones were subject to intense erosion, which has resulted in the formation of Neogene sands and relicts have been preserved. Quaternary sediments were deposited on top, probably mainly during MIS3 and the LGM. The stratigraphy outside the cave entrance is complex because it has been impacted by sedimentation from the sedimentary cone at the cave entrance. Further analyses will be conducted on the cultural layers with OSL playing a key role. Remains of glacial fauna in these layers confirm our expectation that these layers were probably deposited during the last glacial period. Faunal taxa include cave bear, woolly rhino, horse, wolf, bison, polar fox, red fox, cave lion, cave hyena, reindeer, red deer, polar hare, common hare and auroch. A large number of bones have also been recovered from the excavation of the spoil heap, but these have not been analyzed yet. Analysis of microfauna has not been completed. Human remains have not been identified as yet. Other finds include stone artefacts with some backed blades that can be classified as Magdalenian. Several large stone tools can be considered Middle Palaeolithic. An interesting find is an intentionally engraved fragment of limestone, which may represent a ‚cutting board', or a symbolic engraved object.
The field research will continue for the next two years. One goal is to wet-sieve the maximum amount of spoil heap sediments, and also to find Neandetrhal remains that may have been missed during the original excavations and accidentally discarded. Such remains could be analysed in detail using modern anthropological and genetic methods. Another goal will be detailed excavation and analysis of intact sediments outside the cave entrance. Some samples have already been collected from these sediments for geoarchaeological (micromorphology, geochemistry), OSL dating, radiocarbon dating and sediment DNA analysis. In the future, we plan to extend the excavation of intact sediments, collect more samples for analyses and OSL dating and date tooth enamel using ESR. More information will be provided about this research in upcoming years.

Fig.1: Ochoz u Brna, Švédův stůl Cave excavation, 2019 season.

Fig.2: Ochoz u Brna, Švédův stůl Cave excavation, 2020 season.

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Susanne C. Münzel[1], Saskia Pfrengle[2], Chris Baumann[1,3], Claus-Joachim Kind[4] & Gerd Albrecht[5]
The Magdalenian cave site Gnirshöhle (Engen, Hegau, SW-Germany) – the faunal record and the question of an early phase of wolf domestication

Gnirshöhle is a small cave with two chambers (GN I and II) situated in the Bruder Valley close to Engen (Hegau Jura) and occupied during the Magdalenian. Just a few hundred meters across the valley, the Magdalenian cave site of Petersfels is situated, well-known for its female-shaped personal ornaments made from gagate (fossil wood) (Albrecht, 1979). Although Eduard Peters examined Gnirshöhle already in 1927, he did not reach Paleolithic horizons. Only 1976 during a speleological dig Paleolithic remains were discovered, followed by archaeological excavations between 1977 and 1979 (Albrecht et al., 1977). Despite the restricted space, Gnirshöhle yielded faunal remains with cut and impact marks as well as signs of domestic activities, such as worked antler beams and typical Magdalenian bone needles. Lastly, a third site in this area, Drexlerloch, was discovered in 1978 during construction work, also dating into the Magdalenian (Albrecht et al., 2019). Seemingly, the Bruder Valley was a hotspot of Magdalenian occupation between 16 - 15 ka cal BP. Faunal remains of all three sites consist mainly of reindeer and horse, while in Gnirshöhle canids were more commonly found. Sixty canid remains were identified in GN I and five in GN II, from a total of 4569 and 322 faunal remains, respectively. Of special interest is a right canid mandible from Gnirshöhle I (Fig. 1), which was proposed as a possible dog by its relative shortage of the tooth row and a tooth crowding between P4 and M1 (Hans-Peter Uerpmann, pers. comm.). This specimen and the other canid remains, were recently studied in a multidisciplinary approach by combining metric and morphological assessment, paleogenetics (see poster by Pfrengle et al., p. 74 in this volume) and dietary reconstruction by stable isotopes (see poster by Baumann et al., p. 20 in this volume).

Fig.1: Image of the canid mandible GN-999 from Gnirshöhle I (Scale: 20mm).

While morphological examinations and phylogenetic relationships did not unequivocally assign them to any specific canid lineage, the isotope analysis uncovered a dog-like low $\delta^{15}N$ protein diet for all analyzed Gnirshöhle specimens. Thus, we consider the Gnirshöhle canids to likely represent an early phase in wolf domestication – facilitated by humans actively providing a food resource for those early domesticates. Once the process of domestication began, humans quickly gained control over the diet, reproduction, and health of their new companions and thus set the stage for a lasting human-dog bond (Baumann et al, 2021).

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Zdeňka Nerudová[1] & Petr Neruda[2]

Hošťálkovice II – a revival of the Gravettian site near Ostrava (Moravia, Czech Republic)

Hošťálkovice II open-air site belongs to an important cluster of Gravettian sites in the the region of Ostrava City. The site is situated at a strategic position above the confluence of Odra and Opava Rivers (Figure 1) at the top of the hill called Hladový vrch. The western part of the hill was destroyed by local mining in a quarry in 19th/20th century.
The archaeological site Hošťálkovice II was briefly mentioned for the first time by K. Žebera (Žebera et al. 1956). The exact position of the site became unknown and artefacts found by Žebera were lost. Few years later, an amateur archaeologist J. Homolka revisited the site and found several artefacts on the eastern slope of the hill (Klíma 1969). Following surface prospections was made by Petr Neruda who cleaned a profile in an abandoned quarry and found an intact layer with lithic artefacts represented mostly by blades and cores.

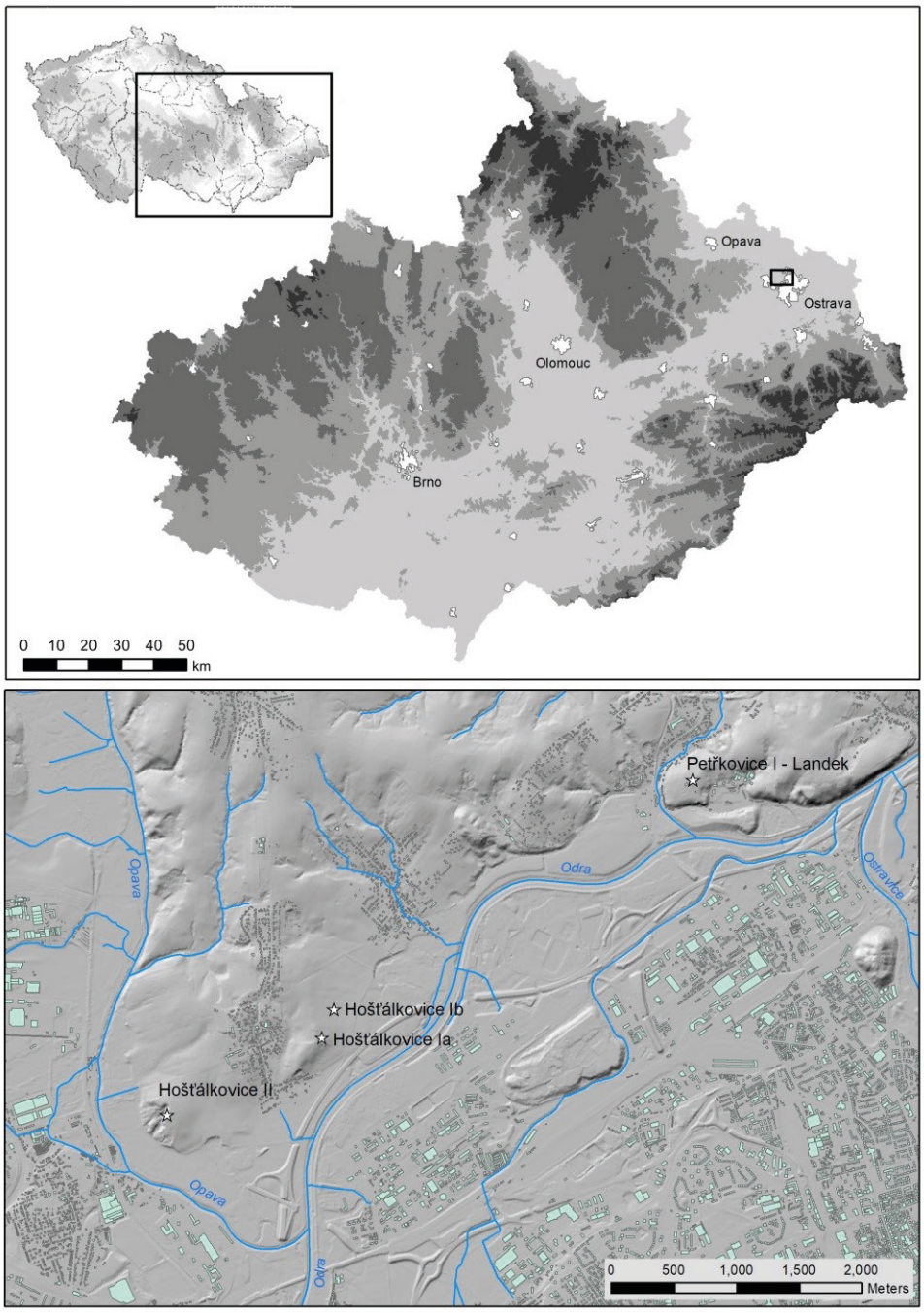

Fig.1: Map with the site position of the most important sites in the Ostrava Region. Digitised by P. Neruda.

They were gradually extracted from 1982 to1995 (see Figure 2a) and from the technological point of view, they are most similar to the Gravettian industry (Neruda 1995). A small test pit located 1.5 m from the original profile was excavated by Z. Nerudová and amateur collaborators in 1995. Two horizons with artefacts were documented; a Gravettian one at the bottom above a gravel layer (D) and another with non-patinated artefacts 30–40 cm under the surface (Figure 3). This finding led to the suggestion of two phases of the occupation - a Gravettian as well as younger (Neolithic?) occupation (Neruda - Nerudová 2000). The same test pit was later re-opened and used by L. Lisá for OSL sampling (Lisá et al. 2014).

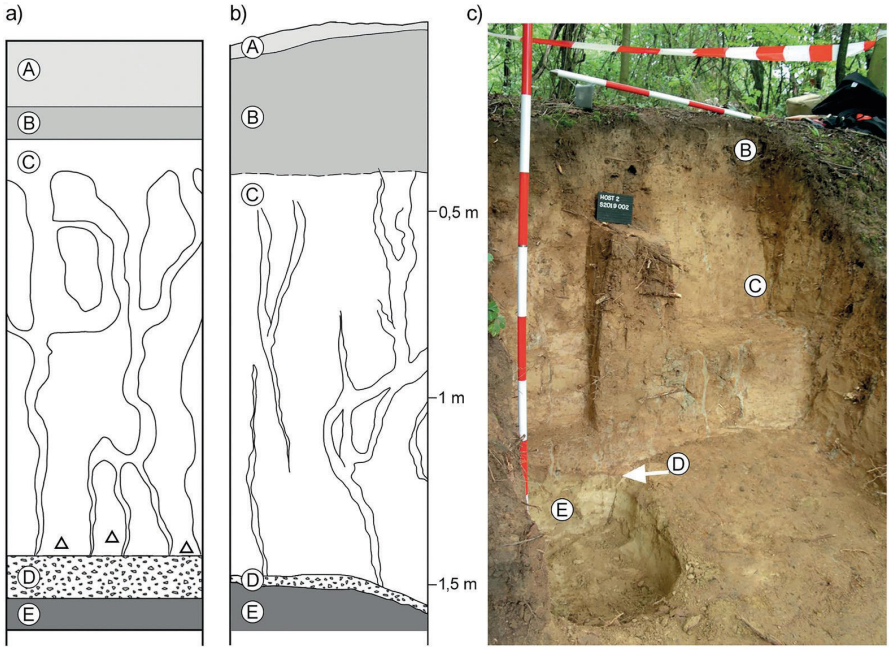

Fig.2: Comparison of the former profile of the quarry, where the artefacts were found during the excavations in 1985–1992 (a), with a new profile of the quarry cleaned in 2019 (b) and its photographic documentation (c). The arrow point indicates the position of the gravel sand D, which formed only a small layer here. Photo P. Neruda, digitised by Z. Nerudová.

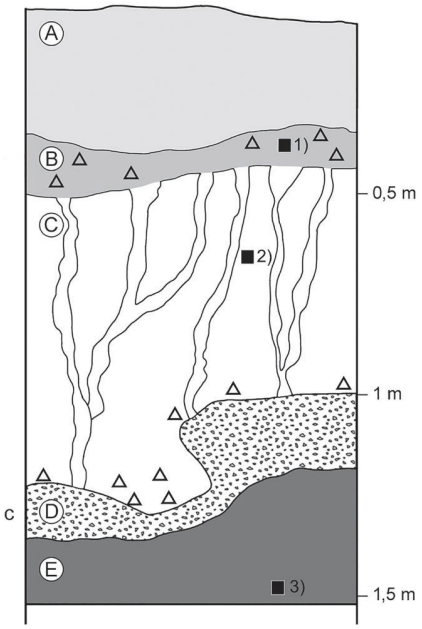

Fig.3: Northern profile of the 1995 test pit, the projection of artefacts from layer 1 and 2 (triangles) and three samples taken for OSL dating (black squares) of the identified stratigraphy. Resulting OSL data, according to Lisá et al. 2014, are as follows: 1) 5.3 ±0.7 ka; 2) 26 ±3 ka; 3) 50 ±5 ka. A – recent horizon, B – light-grey sediment, C loess-like sediment, D- sandy-gravels, E – clay-sandy sediment. Digitised by Z. Nerudová.

In 2018, during surface prospection in the proximity of the local quarry, sporadic patinated artefacts were found in the area of a former orchard. We expected that the Palaeolithic layer with artefacts should be preserved relatively close to the surface. In 2019, we excavated a small trench in the spot where a concentration of patinated artefacts was found on the surface.
An excavation conducted in 2019 approx. 30 m away from the 1995 test pit showed significant differences in stratigraphy. The layers were markedly thinner in comparison to the test pit excavated in 1995, the original profile from the 1980s and the new profiles at the quarry wall (compare Figure 4 with Figs. 2 and 3). The maximum thickness of the sediments does not exceed 30 cm. Both patinated (Palaeolithic) and non-patinated (Post-Paleolithic?) artefacts were situated throughout the profile (Nerudová – Neruda 2020).
Due to the intense post-depositional changes, bioturbation and recent activity at the site (repeated modification of the orchard), it was impossible to divided individual archaeological horizons. Patinated, non-patinated artefacts as well as ceramic and iron fragments were mixed in the loess-like Sediment B1 and B2 and also in the humic Sediment A (A-Horizon of the Holocene soil). In all cases, the finds were situated above, or in contact with Sediment C1 represented by reworked loess with gravel (Figure 4).
The non-patinated artefacts can probably be associated with the Mesolithic on the base of a small re-oriented core and a short end-scraper. A patinated dihedral burin and a blank made from rejuvenation of a core platform fits well with typical Gravettian material found in the quarry profile in the 1980s and in test pit made in 1995 (Nerudová – Neruda 2020: Fig. 5).

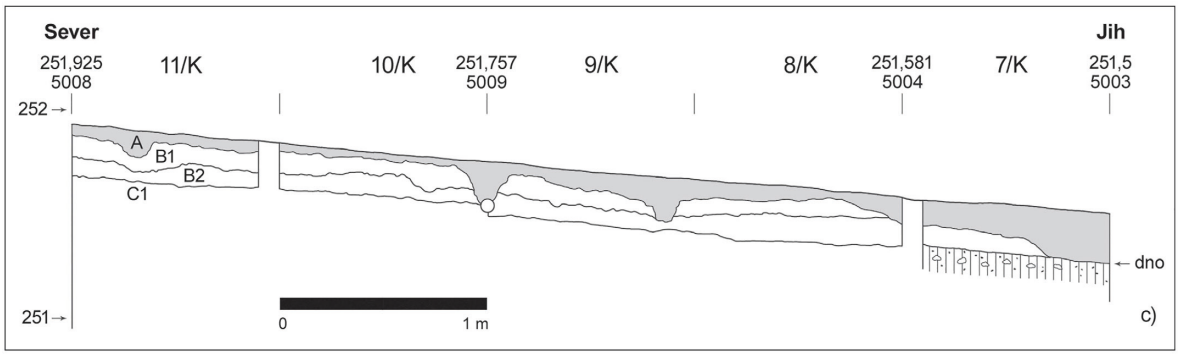

Fig.4: NS longitudinal profile of the trench 2019. Digitised by P. Neruda.

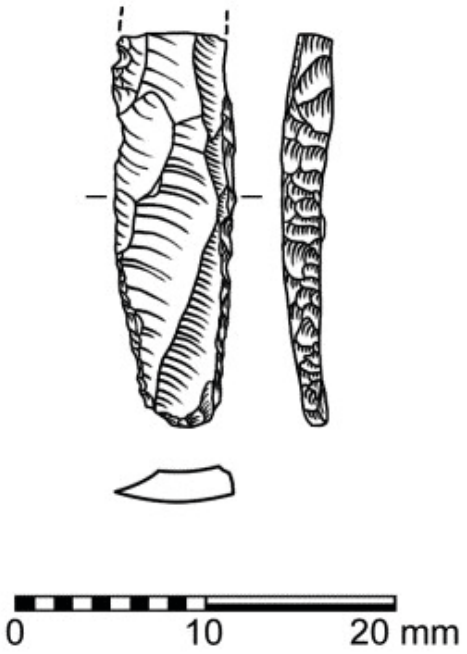

Fig.5: The bladelet from Sediment B2, excavation 2020. Drawing by T. Janků.

During the second field-season 2020 we opened the new trench in dimension 3×3 m that partly contained the small test-pit from 1995. The stratigraphical sequence was identical, however we divided Sediment B into two sub-horizons on the base of the color differences. The upper part – Sediment B1 (probably of Holocene age) contains micro-lithic non-patinated artefacts, individual charcoals, fragments of irons, ceramics and glass. Sediment B2 (we expect Late Pleistocene / Early Holocene age) contains slightly or no-patinated micro-lithic generally un-diagnostic artefacts, individual charcoals, occasionally fragment of irons, ceramics, and glass in spots disturbed by roots. Only one toll represented by a backed bladelet was found (Figure 5). Despite the expectation, the underlying reworked loess-sediment C did not contain any artefacts even at the bottom of the sediment where Gravettian lithic artefacts we uncovered in the test pit 1995.
Better results we obtained from a probe situated 10 m to the east. Using a scraper we open cross-shaped probe in direction east-west and north-south. There, we recorded the same stratigraphy and we found artefacts *in situ* in three different horizons (in different profiles), i.e. non-patinated artefacts in Sediment B1 andB2, and patinated artefacts of Gravettian age at the bottom of Sediment C.
At the same time we cleaned and documented several profiles in the quarry wall to control the stratigraphy of the site. One probe situated near the first trench made in 2020 contains lithic artefacts in two different sediments – B2 and C (the Gravettian horizon). Other probes in the quarry wall were sterile and showed decreasing of the thickness of Pleistocene Sediment C.
During the excavations 2020 we recorded some individual charcoals from Sediments B1 and B2, characteristic for Holocene Period (*Abies, Acer, Betula, Salix* and *Ulmus* according to determination made by Z. Vaněček). No charcoals or hearth were found in the Gravettian layer. From the west profile of the cross-probe we took two samples for OSL dating. The OSL date for sediment B2 is GdTL-3694: 0.610 (64) ka and OSL date for sediment C with Gravettian artefacts is GdTL-3695: 27.9 (19) ka. The second date fit well with expected age of the artefacts and with dating made by L. Lisá et al. (2014; see Figure 2).
The local quarry, abandoned around 1927 (Jirásek et al. 2012), probably destroyed a main part of the Gravettian site. The relict of the Gravettian layer with artefacts *in situ* was found by P. Neruda in the quarry wall. The archaeological site continues to the east and south-east from this spot. The Quaternary sediments markedly decrease in thickness in the southerly direction. Based on an analysis of the lithic pieces, we can confirm the observation from 1995 that at least two phases of occupation are present at Hošťálkovice II. Apart from the Gravettian occupation, the site was also used later, probably during the Mesolithic period. The younger occupation is rather unexpected for this region due to the position of the site at a relatively high elevation (Neruda 2018). The precise analyses of the micro-stratigraphy of younger occupation at the site are difficult due to the intense post-depositional changes, bioturbation and recent activity at the site.

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The Gravettian sequence of Mitoc-Malu Galben (Romania): New fieldwork between 2013 and 2016

In our presentation we will summarize results of fieldwork conducted at the Upper Palaeolithic open-air site Mitoc-Malu Galben in northeastern Romania. The site has a ~14m deep loess-paleosol sequence with a rather high climatic resolution. The chronostratigraphy is well established and embedded in this long sequence are abundant archaeological remains, mostly attributed to the Aurignacian and Gravettian. Our fieldwork between 2013 and 2016 provided new samples of the Aurignacian and Gravettian archaeological layers. Here we provide an overview of our fieldwork activities, the generated archaeological collections, and present a preliminary analysis of raw material economy and blank production and core exploitation strategies of the Gravettian assemblages. We also discuss the Mitoc-Malu Galben Gravettian in its wider regional context and implications for the Aurignacian-Gravettian transition.

Acknowledgements:
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Palaeolithic sites and where to find them. A predictive modelling approach to assess site expectancy in the Southern Levant

Site preservation and associated terrain characteristics are among the major agents controlling the spatial distribution and discoverability of late quaternary archaeological sites. However, site expectancy in extensive areas can be determined using a combination of geoarchaeological investigation and digital spatial analysis. In that sense a prediction model, respectively the result of a Multi Criteria Decision Analysis (MCDA), is presented to highlight areas with a high potential to contain Upper Palaeolithic sites in the Eastern Mediterranean and bordering arid margins. Based on detailed on-site analysis in the Wadi Sabra region with its many sites and the location of other well-known sites in the southern Levant, eight individual parameters, aspect (cardinal point), elevation, geomorphology, hydrogeology, drainage network, slope inclination, vegetation, and a terrain ruggedness index (TRI) are evaluated and tested for significance. The statistical results confirm a significant divergence of the spatial distribution of Upper Palaeolithic sites from the distribution of natural terrain position factors. This allows for a definition of parameter classes with a high site expectancy and their use in a predictive model. For the results map, the site expectancy factors determined in this way were intersected with each other, thus enabling a distinction between areas with a high and low site occurrence probability. The accuracy of the presented result is assessed by the implementation of another MCDA pass based on an independent dataset of archaeological survey sites and compared to the original. Both datasets complement each other and can show the potential for further investigations with more numerous site datasets as well as more detailed spatial information. A local classification based on high-resolution elevation information and field data is evaluated for the Wadi Sabra, Southern Jordan, which can confirm yet further specify the result from the MCDA.

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Episodes of Magdalenian Hunter-Gatherers in the Upper Gallery of Tuc d'Audoubert (Ariège, France)

The Tuc d'Audoubert cave (Ariège, France) offers unique insights into the life of Late Pleistocene hunters-gatherers due to its exceptionally good preservation conditions. This is especially true for the 300 counted footprints in the upper gallery of the cave. Even for the layperson some trackways are easily recognized. Short episodes of past life become tangible. The spectrum of scientific analytic methods used in Western science has not yet provided an option to interpret these visible episodes satisfactorily. For this reason, tracking experts, i.e. indigenous ichnologists, were invited to analyse the footprints in Tuc d'Audoubert. With their dynamic approach of identification, they are able to do justice to the dynamics embodied in the footprints. In total, nine main concentrations in six different sections were studied. 250 footprints were identified and grouped into 24 events. In view of the group compositions and the assumption that humans did not climb alone into the upper gallery for security reasons, it can be concluded that a maximum of five visits by two to six subjects were carried out. Among the events the couple of an adult man and an adult woman, who appear together in a total of 10 different spots, is particularly noteworthy. Altogether, this study is a first step of a multi-stage procedure.

Fig.1: Identification of prehistoric footprints in Tuc d'Audoubert in 2018 (Photo Tracking in Caves/Association Louis Bégouën).

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Cold climatic conditions for *Homo sapiens* in the Initial Upper Palaeolithic – direct evidence from Bacho Kiro Cave, Bulgaria

The spread of *Homo sapiens* into Europe and Central Asia during early Marine Isotope Stage 3 has been frequently discussed in relation to the rapid and dramatic shifts in climate during the Late Pleistocene. It has been proposed that such dispersals, as represented by the archaeological record of the Initial Upper Palaeolithic (IUP) and later the (Proto)Aurignacian, largely occurred during warm phases of the Last Glacial Period (Staubwasser et al., 2018; Müller et al., 2011; Hublin, 2015). However, such correlations have been difficult to demonstrate clearly, as these modelled scenarios predominantly rest on correlating the chronometric ages of archaeological finds with climatic phases documented in spatially distant climate archives such as ice core or speleothem records.
To obtain direct evidence for the palaeotemperature conditions faced by these humans, we apply sequential oxygen (phosphate) isotope analysis to *Bos/Bison* and *Equus* teeth associated with the IUP record of Bacho Kiro Cave, Bulgaria. Dating to 45,040 - 43,280 cal BP in Layer N1-I & I, and likely beginning as early as 45,990 cal BP in Layer N1-J, the IUP deposits from Bacho Kiro Cave represent the earliest clear evidence of *H. sapiens* in Europe and one of their richest archaeological records (Hublin, 2020; Fewlass et al., 2020).
The stable isotope results show cold conditions for the IUP occupations, with a mean annual temperature estimate of -3 ± 2.5 °C. These results contrast with models of exclusively warm-phase dispersal, and imply a more variable relationship between climatic conditions and the expansion of our species during the Last Glaciation, where human populations were likely

more capable of survival in different conditions than previously proposed. Our results highlight that ongoing work to generate climatic data directly from archaeological materials is key to refining our understanding of Late Pleistocene evolutionary and demographic processes and that models of these processes need to incorporate a wider range of climatic and non-climatic factors behind human dispersal.

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Researches at the Early Gravettian site of Piovesello in the Northern Apennines

The Gravettian settlements of Europe are considered as an expression of human adaptation to harsh climates. In Southern Europe, however, favorable vegetation-climate conditions supported hunters-gatherer subsistence and the maintenance of their large-scale networks. This was also the case of the North-Adriatic plain and the Apennine mountain ridge in Italy. Traditionally considered lacking evidence, the northern part of the Apennine ridge has recently yielded the Early Gravettian site of Piovesello, located at 870 m a.s.l. Surveys and two excavation campaigns revealed lithic artifacts and charcoals in primary position embedded in loamy sediments (Peresani et al., 2018). In particular, Archaeological investigations have brought to light a small lithic workshop composed of 123 artefacts (Structure I), which was documented developing a conservative protocol based on a three-dimensional reconstruction of the heap, enabling us to restore information lost during the removals of the flakes. To reconstruct the formation process of the structure, we investigated its stratigraphy and performed the analysis according to different technological and morphometrical parameters, as core reduction stages, dimensional classes, presence of direct connections like refittings. Once Structure I has been interpreted like a primary workshop formed during knapping activities, it was possible to cross different data and to recognize six depositional stages (Zangrossi et al., 2019). We were able to recompose several multiple and complex lithic refittings,

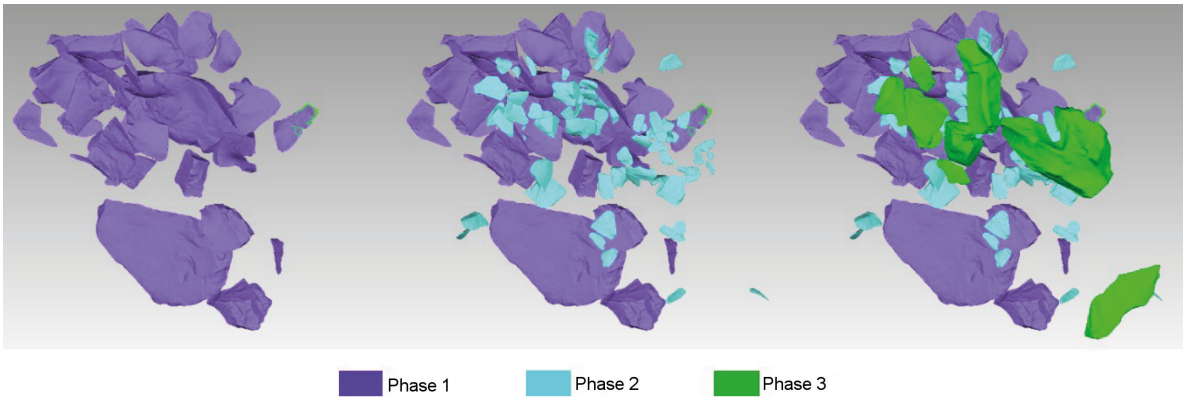

Fig.1: Three phases of artefacts accumulation at Piovesello.

which hints to an on-place exploitation of radiolarite blocks and slabs and provides detailed information on the management of blade and bladelet production at Piovesello. Cores were mainly exploited in their major length following a frontal and unipolar mode, that was partially investigated through the virtual analysis of a 3D-refitted reduction sequence (Delpiano et al., 2019). Bladelets were also produced through the burin-like reduction of large and thick flakes. Integrative approaches are providing the first preliminary data on the skills of lithic knapper(s), while the scarcity of retouched tools (mainly backed implements) points out the ephemeral and short-term nature of the camp site. Radiocarbon dating, anthracological and extended palynological and microcharcoal analyses have been integrated to reconstruct the palaeoecological context of this camp which was probably positioned above the timberline in an arid rocky landscape, bounding the fronts of local glaciers close to their maximum expansion at the time of Greenland Stadial (GS) 5 (32.04 - 28.9 ka cal BP). The introduction of radiolarites from sources in proximity to the site and of chert from very far western sources concur to project the site of Piovesello within the long-distance connections attested between the Ligurian-Provençal arch and the Great Adriatic-Po Region (GAPR) (Peresani et al., 2020).

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Insights into multidisciplinary analyses of the Paleolithic open-air site *Feldberg "Steinacker"*

While cave sites with Middle- and Upper Paleolithic occupations are well known in southwestern Germany, especially from the Swabian Jura, open-air sites are still exceedingly rare. This is due to a research focus on the sheltered places across Europe during the early decades of Paleolithic research. In contrast, Pleistocene open-air sites often encompass distinct problems concerning recognition and preservation, which hampered research for a long time.
Today, modern methods like the analysis of geomorphological thin sections, OSL dating and geophysical survey tools contribute significant data for the reconstruction of the paleo relief, the site formation processes and the environmental conditions. Additionally, the application of Use-wear analysis of stone tools can provide detailed information about human activities, even if "traditional" approaches to lithic analysis fail.
The interdisciplinary framework of the Feldberg "Steinacker" project is exemplary for this development. Preliminary data from all disciplines are presented in detail in this poster presentation.

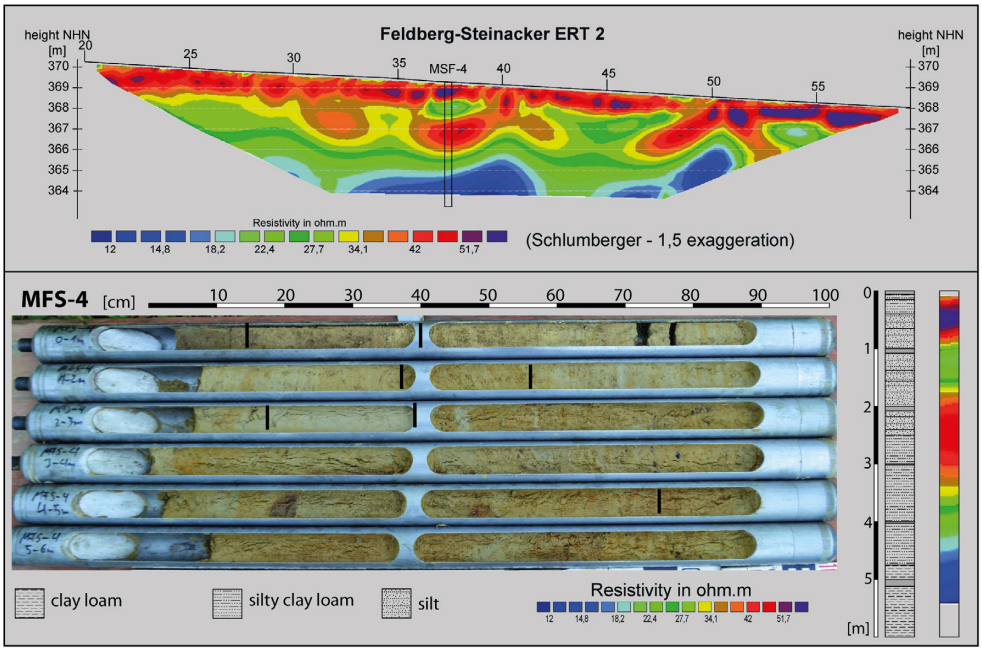

Fig.1: Results of the Geoelectric survey.

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The osseous projectile technology of the Central European late Upper Palaeolithic: Results and questions from a three-year research project

From 2016-2019 an interdisciplinary study was carried out, dealing with the ballistic hunting implements of bone, ivory and antler used by lateglacial societies in Central Europe from around 21.000 to 15.000 cal BP. On the one hand, the multilayered connections between available raw materials, weapon designs and different prey species were dealt. On the other hand, the typological diversity of projectiles and their spatial distribution yielded new information on the chronological subdivision of the Magdalenian between Rhine and Vistula, and hence produced further clues – and questions – about the timing and conduct of the recolonization of that area during and after the Late Glacial Maximum.

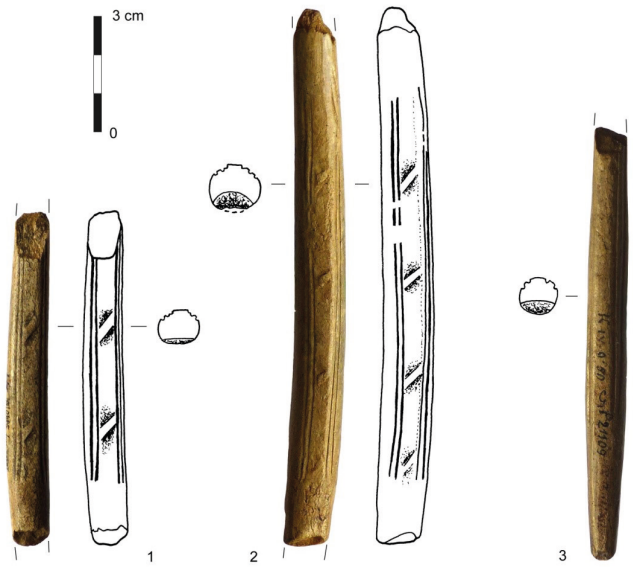

Fig.1: Massive-based osseous points decorated with raised humps from the Moravian Karst, Czech Republic. 1 – Balcarka cave, 2 & 3 – Pekárna cave, layer g/h. Collections Moravian Museum Brno, images by Sebastian Pfeifer.

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Mitochondrial diversity and early stage of wolf domestication - The case study of Gnirshöhle (Hegau Jura, SW-Germany), a Magdalenian cave site

Wolves are known to be the oldest animals domesticated by humans. Despite several investigations on wolf domestication, the geographic and temporal origin of this process is still being debated. To address this issue, our study sheds new light on the early stages of potential wolf domestication during the Magdalenian period (16-14 ka cal BP) in the Hegau Jura region (Southwestern Germany and Switzerland). By combining morphology, genetics, and isotopes (see poster by Baumann et al., p. 20 in this volume our multidisciplinary approach helps to evaluate alternate processes driving the early phases of domestication. The isotope analysis uncovered a restricted diet (see poster by Baumann et al., p. 20 in this volume) for all analyzed specimens from Gnirshöhle cave (see presentation by Münzel et al., p. 62 in this volume), while morphological examinations and phylogenetic relationships did not unequivocally assign them as dog-like or wolf-like canids.

Intriguingly, the newly generated mitochondrial canid genomes identified a high genetic diversity in the Gnirshöhle canids with one specimen genetically close to pre-LGM canids as well as others close to ancient and modern European canid genomes. Such high mitochondrial diversity could imply that Magdalenian people tamed and reared animals originating from diverse wolf lineages. We discuss our results in light of different ecological scenarios to infer which best reflects our outcomes and propose that a specialized wolf ecomorph is highly probable. However, with respect to their proximity to humans indicated by the restricted diet, we conclude domestication as the most likely scenario explaining the patterns observed herein.

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Middle Gravettian of Moravia, regionalization, chronology and behavioral complexity of Pavlovian groups?

During the Upper Paleolithic, the geomorphologically rugged territory of Central Europe, creating natural barriers and refuges, represented a complex area occupied by several human groups with different cultural and social behavior.
Discoveries of new sites as well as revisions of historical collections over the last two decades has revived discussions about the chronology of Gravettian and about an existence of different chrono-cultural groups inhabiting the territory of Moravia and surrounding areas. During the Middle Gravettian, in relatively short period of time (28,500-25,500 BP uncal) there were two groups with an advanced social and economic system in the Moravian Corridor and in the adjacent Krems-Wachtberg area – a *group with microsaws* and a *group with geometric microliths*. Settlement of the *group with microsaws* has been identified in areas situated approximately every 50 kilometers along the entire Moravian Corridor: in the Dolní Věstonice-Pavlov-Milovice settlement area, in the area of Předmostí sites and in the Uherské Hradiště microregion (on the middle course of the Morava river). They are followed by the Krems-Wachtberg site in Lower Austria, which is, however, atypical in many respects.

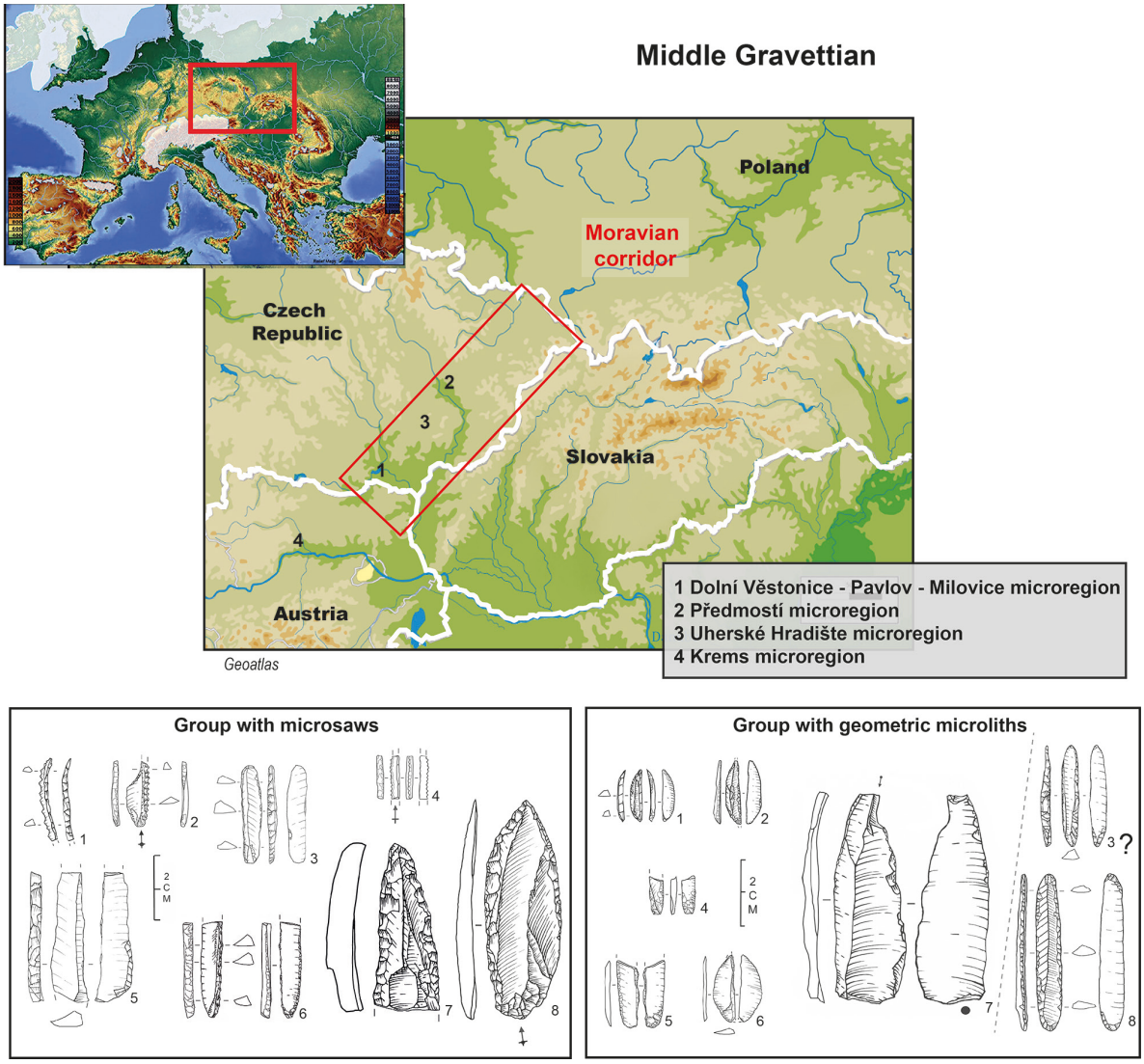

Fig.1: Middle Gravettian on the territory of Moravia and surrounding areas. General map of Central Europe with mentioned settlement areas and typical lithic artefacts of two different chrono-cultural groups.

There are several sites in each settlement area with different function. Their lithic industries are systematically tied to the import of high-quality raw materials from the Kraków-Częstochowa Upland (southern Poland), supplemented by "erratic flints" from glacial and glaciofluvial deposits in northern Moravia and Silesia. The raw material was usually supplied in the form of blocks, indicating a special feature of this group. Only two sites are outside out of this stable strategy - the settlement units on the top of Dolní Věstonice II site and the site of Krems-Wachtberg. Their raw material usage with different composition is atypical, what consequently affects the character and typological composition of their lithic assemblages.
There is a question, how these individual settlement areas worked. Whether there was a hierarchy of sites with different character and function in each of them (base camps with dwellings, hunting stands, killing sites etc.), or there existed aggregated sites (such as Pavlov I or Dolní Věstonice I) where various groups of people could meet together.
According to currently available radiocarbon dates, the territory of Moravia was occupied by also another group of Pavlovians at about the same time - the group with geometric microliths. This group is characterized by different strategies of raw material acquisition as well as by different lithic production system and typological composition in tool assemblages, what points to its different behaviour and standards. In addition, its settlement strategies seem to be different and there are known only few sites settled by this group - the sites of Pavlov I, Předmostí I, Předmostí III and Milovice IV.

The goal of our contribution is twofold:

- to reflect on the chronology of the Middle Gravettian in Central Europe and especially Pavlovian, whether the groups with two different technical traditions could occupy the territory in same time and interact with each other, or, on the contrary, there were two highly-developed groups that interchanged in the same place in rapid succession;
- to think about functioning of a such Upper Paleolithic comprehensive system, with advanced behavioral complexity of the both groups, what raises the question of whether the individual settlement areas coexisted together at the same time, with direct contacts between their residents, or they gradually shifted along the Moravian Corridor and the adjacent Krems-Wachtberg area.

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Galina N. Poplevko[1] & Ekaterina V. Doronicheva[2]
Functional variability of lithic tools from layer 2 at Psytuaje Rockshelter, North-central Caucasus, Russia

North-Central Caucasus, located between the volcanic peaks in the Caucasus – the Elbrus (5642 m) and Kazbek (5054 m) mnts., is known as the region, where the only obsidian source Zayukovo (or Baksan) in the Northern Caucasus is located. This obsidian was widely exploited in the Paleolithic of the Caucasus but the most active transport of this material began in the Epipaleolithic period (17/15-10/12 kya) (Doronicheva et al., 2019). At the same time, Epipaleolithic stratified sites are not numerous near the obsidian source, in the Elbrus mnt. region. Only three stratified Epipaleolithic sites are known here, these are: Sosruko Rockshelter, Badynoko Rockshelter, and recently discovered (in 2018) Psytuaje Rockshelter (Doronicheva et al., 2020a; Golovanova and Doronichev, 2020). Psytuaje Rockshelter is located ~7 km south from the town of Zayukovo in the Baksan river valley (Terek river basin), about 20 km north-west of the city of Nalchik (the capital of the Kabardino-Balkaria Republic, Russian Federation). The rockshelter is situated in a deep (up to 200 m), terraced and forested valley of the Fanduko (or Saradj-Chuko) River (a small tributary of Kishpek River – tributary of Baksan River), 18 m above the river, and about 3-5 km upstream the river from Saradj-Chuko grotto, in which our team excavated the Middle Palaeolithic occupation (Doronicheva et al., 2019a, b; 2020 b). Lithic collections of Layer 2 (2018 test pit, 2019 excavations) comprises of 634 mainly flint and obsidian artifacts. The date of 11340±700 cal BP (LU-9216), defines the minimum radiocarbon limit of layer 2 and consequently suggests the final Epipaleolithic age of the assemblage recovered in this layer (Doronicheva et al., 2020a). The lithic assembladge includes cores, CTEs, flakes, blades, bladelettes, microbladelettes, shatter, chips, and tools, as well as several other objects.
We would like to represent the preliminary data on use-wear analysis and function of lithic artifacts from ly. 2. Traceological studies were performed with the use of S.A. Semenov method (1957; 1964) with methodological additions by G.N. Poplevko (2007), which include the study of the relationship between typological, technological and traceological definitions of artifacts. The study was carried out at MC-2CR-ZOOM microscope with a magnification of up to 160x, using a Sony-ZOOM camera for microphotography with a magnification of up to 240x. Our results show that different activities related to hunting prey and knapping of raw materials were performed at the site during the formation of Layer 2 at Psytuaje Rockshelter.

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The role of quartzite in a Gravettian hunting post: geoarchaeological characterisation of raw material in the layer CO.B.6 from Coímbre Cave (Asturias, Spain)

During the last twenty years, researches that address raw material characterisation based on a solid geoarchaeological study have been widening the understanding of Upper Palaeolithic societies in the Cantabrian Region. Nevertheless, there is an almost complete lack of information of these kinds of investigation in the western part of this area motivated by historiographical issues (Herrero-Alonso et al., 2020) and by the high representation of quartzites in the lithic assemblages (Prieto, 2018). In general terms, this lithic resource constitutes the second most-relevant lithic raw material used during the Palaeolithic after flint. The absence of geoarchaeological characterisation of quartzite implies biases and a great loss of information (Prieto, 2020). Furthermore, differences in the geographic distribution of raw materials, together with chronological and interpretive issues, modify our perception of the raw material economy during the Palaeolithic. Therefore, in periods in which raw materials other than flint are relevant, there is an information loss while interpretation promotes historical narratives based mainly on human mobility, the most relevant conclusion reached from the study of the last rock.
The main aim of this presentation is to deepen into the knowledge of the raw material economic mechanisms employed by the Gravettian inhabitants of the Cares River Valley, on the western part of the Cantabrian Region, Spain (Álvarez-Alonso et al., 2017a). To do so, we are going to present the data acquired from the lithic assemblage of the layer CO.B.6 of Coímbre cave. The analysis is especially focused on the quartzite, a rock which constitutes approximately 80% of the assemblage. To analyse this material, we applied a methodological approach that combines petrographic characterisation using stereomicroscope and polarizing microscopes and chemical analysis by X-ray fluorescence following the protocol proposed in the region by our team (Prieto et al., 2019; 2020). This procedure allows us to characterise and assign each lithic fragment to a petrogenetic type of quartzite using a solid geoarchaeological basis. This protocol, together with the identification of cortical areas and the information derived by the characterisation of potential catchment areas, enable us to determine the origin of quartzite, proposing also the procurement strategies employed by Gravettian people (Prieto et al. 2021).
Finally, and together with the information derived from technological characterisation, we are going to present the management of this raw material. We would like to acknowledge that on this presentation we also present data derived from the techno-typological analysis of flint artefacts taking into account their types and varieties (Álvarez-Alonso et al., 2017b). The latter allows us to have a more complete idea of raw material management and procurement strategies on this layer.

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Michał Przeździecki[1], Natalia Gryczewska[1], Witold Migal[2] & Katarzyna Pyżewicz[1]
A Magdalenian campsite at Ćmielów in Southern Poland

The open-air site Ćmielów 95 is situated on the north-eastern fringe of the Holy Cross Mountains, at the confluence of rivers Kamienna and Przepaść. It is located on the borders of two mesoregions – Iłża Piedmont and Sandomierz Upland – that are significantly different in terms of geomorphology and type of landscape. The first oneis characterized byfluvioglacial sediments, the second one is covered with loess. Ćmielów 95 was discovered and excavated in the years 2004-2009, fieldwork encompassed a total area of about 365 m^2.A rich assemblage of artefacts madeof flint, obsidian, stone, and hematite,was collected. Overall 16 thousand pieces, most of it lithics, including tools, cores and debitage products.

Fig.1: Ćmielów 95. Magdalenian structure during fieldwork (photo: M.Przeździecki).

Ćmielów 95 is one of the most unique Magdalenian sites known in Poland. Among over two thousand stone artefacts are six ornamented sandstone slabs and spindly shaped item made of grey slate. Other significant artefacts are fragments of discs (rondelles) made of hematite and chalk. Traces of incisions and carvings that they wear,indicate their symbolic character. What is more, during excavations a few structures have been discovered. The biggest one is a pit that has a regular oval shape, its size 2 x 2,2 m and its depth about 90 cm. It has distinctive borders and an almost flat bottom.
What makes the site additionally unique are geological conditions that contributed to its preservation.Even though it is situated on a loess hill, a stratigraphical sequence with distinctive Late Pleistocene paleosoils levels was uncovered.
Currently, all the materials are being re-examinedand are undergoing various analyses. In order to determine the origin of stone and hematite artefacts,physicochemical analyses (RTG-CT, XRD, XRF) are being conducted. At the same time standard archaeological studies, like morphometric, typological, technological and spatial analyses are being carried out.

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On the form and function of Jerzmanowician leafpoints

Jerzmanowician leafpoints are a well-known fossile directeur of the transitional industries represented by a complex of Lincombian-Ranisian-Jerzmanowician. A considerable amount of literature on sites containing mentioned tools have been published (Kozłowski 1983; Desbrosse, Koslowski 1988; Jacobi 2007; Flas 2011; Kozłowski 2010; Kot 2016 and others). According to the available radiometric dates, the Jerzmanowician technocomplex can be dated to 44 - 40 ky BP (see Bobak et al. 2013; Chmielewski 1961; Krajcarz et al. 2017). Although some research pointed out that Jerzmanowician leafpoints played a part of hunting weapons, no functional studies have been reported. For this reason, we undertook research mainly aimed at the recognition of Jerzmanowician leafpoints function. As the point of reference, we have analysed artefacts from Nietoperzowa cave, which is located in Kraków-Częstochowa Upland (Jerzmanowice).
Examined artefacts included tools and their fragments found in layers 6, 5a and 4 (Chmielewski 1961). The analysed artefacts come from excavation conducted by both L. Kozłowski and W. Chmielewski (1961). Analysed group of lithics is made of Jurassic and chocolate flints. As a blank of tools, blades or elongated flakes were used. Leafpoints contain specific invasive retouch in most cases limited to the distal and proximal parts. The retouch is oriented on the ventral-or dorsal or dorsal and ventral side. Only single tools demonstrate fully bifacial shaping.
To determine the tool function, we applied microscopic observations. Moreover, we have performed geometric morphometric tests and scar pattern analyses, which shed some light into the trajectory of the tool's shape changes. The geometric morphometric tests showed that Jerzmanowician leafpoints are very homogenous in terms of their shape. We recorded some cases of giving a similar outline of specimens after their unintentional breakage.
Microscopic studies indicate that the majority of tools contain traces of use as a hunting weapon, apart from single cases of signs of different function. Our preliminary research shows that these tools were made indeed to meet the needs of the hunting area.

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Tobias Reuter

Evaluating technological concepts in lithic production - New perspectives on the Federmesser-Gruppen in Northern Germany

The climatic fluctuations during the Lateglacial led to a multitude of transformations in the environment of Northern Europe, which were accompanied by changes in the behavioural practices of human settlers. This is particularly true after the tundra-like landscape transformed into an initial open woodland. During this period a new technological tradition emerged: the Federmesser-Gruppen (FMG). This technocomplex replaced long lasting traditions in the production of lithic artefacts. Whereas the manufacture of the preceding Hamburgian/Magdalénien is characterised by standardisation and a high degree of elaboration, the FMG seem to be much more variable and opportunistic in their technological behaviour. It can be assumed that these changes to some extent are related to the transformations in the environment. But how do specific technological practices relate to environmental changes? To get a glimpse of this complex issue, the technological features of several lithic artefact assemblages from Northern Germany attributed the Hamburgian and the FMG were analysed. Subsequently, technological characteristics were interpreted according to environmental conditions as well as subsistence and settlement and mobility behaviour. The results indicate that the production of lithic artefacts and environmental changes bear no direct functional relationship. Rather, the changed technological behaviour is the result of a transformed adaptive strategy that affected human behaviour.

Fig.1: Refitting from the Federmesser-Gruppen site of Alt Duvenstedt LA120 (Copyright: SSHLM/Fotowerkstatt).

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Florent Rivals[1,2,3], Rivka Rabinovich[4], Hamudi Khalaily[5], François Valla[6] & Anne Bridault[6]
Ungulates paleodiet and seasonality in the Final Natufian assemblage from Eynan/Mallaha (Northern Jordan Valley, Israel)

In this study, we present the combined results of eruption and dental microwear analyses on the ungulate assemblages recovered from the Final Natufian (level Ib) at Eynan/Mallaha (Israel). Dental wear refers to two methods for reconstructing dietary habits in ungulates. They correspond to two scales of analysis, macroscopic (mesowear) and microscopic (microwear), which are related to different temporal scales. Consequently, each method is giving access to very different periods in the life history. Mesowear is a proxy averaging diet over months while microwear reflect the diet of the last days before death. The first objective is to integrate the results from mesowear and microwear to provide indirect evidence of the dietary habits of the ungulates (fallow deer, roe deer, red deer, mountain gazelle and wild boar) and to reconstruct their habitat(s). The second objective is to use tooth microwear patterns (microscopic features produced by food items on teeth) as a high-resolution proxy for estimating the duration of mortality events and their seasonality, and to combine with the data obtained from tooth eruption and wear patterns. Regarding the dietary habits of the ungulates from Eynan, dental wear classifies the fallow deer, roe deer and gazelle as leaf browsers, red deer as grass-dominated mixed feeder, and wild boar in the omnivore category. There is no overlap in dietary patterns, which suggest significant niche partitioning among the ungulates. These data also support the presence of diverse habitats around the site (both wooded and open areas). The study of the mortality events through zooarchaeology or microwear provides significant information about seasonal resource procurement by the Natufian groups. Microwear analysis also permitted to classify each species of ungulate as resulting from seasonal events. The results are supporting the seasonal hunting of the ungulates.

The combined approach permitted to define that fallow deer, roe deer and gazelle were hunted during a single season, probably in the fall; while the red deer was killed over a six-month period, most likely during spring and summer. This combination of techniques opens new perspectives to investigate seasonal patterns of ungulate accumulations in archaeological sites using non-destructive sampling.

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Miriam Rotgänger[1,2] & Gerd-Christian Weniger[1,2]

GIS-based settlement pattern analyses of Late Middle Paleolithic to Magdalenian sites on the Iberian Peninsula

The late Middle Paleolithic and the demise of the Neanderthals is still a controversially discussed topic in prehistoric archaeology. The Iberian Peninsula is characterized by many different geographical and microclimate regions and is therefore an ideal study area for settlement pattern analyses. In the last decades new insights about the Neanderthals' behavior were gained, including the use of marine resources, and creating cave art. In addition, new datings suppose the arrival of an early Aurignacian in the south of the peninsula which raises new questions about the settlement dynamics during the Middle to Upper Paleolithic transition. A total of 277 cave and abri sites from the Late Middle Paleolithic until the Magdalenian (ca 60-12 cal ka BP) were analyzed with several large-scale spatial methods to evaluate settlement patterns and their dynamics.

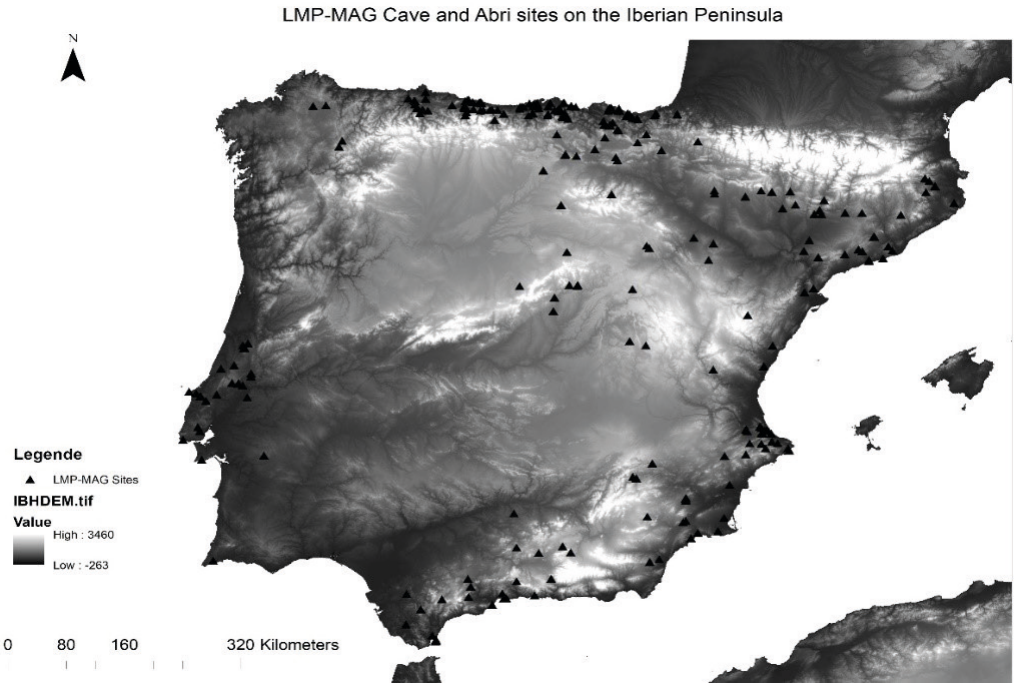

Fig.1: Distribution of Late Middle Paleolithic to Magdalenian sites (n=277) on the Iberian Peninsula.

The Late Middle Paleolithic shows a clear evidence for a highly variable settlement structure indicating that Neanderthals were well adapted to a broad spectrum of environmental conditions ¬¬– from coastal areas to high mountain ranges. This high variability could not be recognized in most parts of the Upper Paleolithic. It is only with the Magdalenian that a comparable variability as in the Middle Paleolithic is reached again indicating that the observed change in preferred settlement locations from the Late Middle Paleolithic to the Aurignacian cannot be attributed to general differences in behavior of Neanderthals and AMH. The analyses of coastal and inland sites show a high number of potential coastal sites in the north. Though there is only one site with clear evidence of the use of marine resources for the Late Middle Paleolithic. On the other hand, the potential coastal sites in the south coincide with the evidence. These differences open new questions about different behaviors of Neanderthals in coastal regions concerning subsistence.

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Evgeny Rybin & Arina Khatsenovich
Blade production in the context of Middle and Initial Upper Paleolithic interaction in eastern Central Asia

Laminar IUP in Central Asia is the short-term and especial event in Paleolithic of Central Asia. Beginning with ca. 50 cal ka ago in Russian Altai, this industry, targeted to large bidirectional blade production and with set of specific tool types, rapidly spread throughout Central Asia. From the west to the east, the primary IUP reference sites include eastern Kazakhstan (Ushbulak), the Russian Altai region (Kara-Bom), northern Mongolia (Tolbor-4, Tolbor-16, Tolbor-21), the Transbaikal area (Tolbaga, Podzvonkaya and Kamenka), Ningxia in north-central China (Shuidonggou) and Tibet (Nwya Devu). Although human fossil remains directly associated with IUP industries have yet not to be found, the startlingly coincident appearance of these complexes is correlated with the first evidence of early modern humans in Siberia. In addition to their approximate chronological synchronicity (the current dates from the Russian Altai are slightly older), these complexes are similar in terms of their technological and cultural aspects as well. The reasons for these similarities, as well as the differences with synchronous assemblages at the same territories, define principal research problems. Blades were intensively used as the tool blanks, having already appeared in local Terminal Middle Paleolithic industries in some of these regions, especially Mongolia. Levallois point production, well-developed at this stage, required preparation of the flaking surfaces of cores by removing marginal blades, thus, in this case, blades were generated as a secondary product. There is some limited evidence of targeted blade production in Terminal Middle Paleolithic assemblages along with Levallois technology, The Terminal MP falls between >50,000–43,000 ya and is partially overlapped by an IUP presence in eastern Central Asia from 45,000–37,000 ya. Considering Terminal MP assemblages with Levallois technology and blades as distinct from IUP complexes, we suggest the existence of at least two blade production traditions. From this point of view, IUP laminar technology was “intrusive” not only into Mongolia, but in other areas in eastern Central Asia and Southern Siberia.

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Florian Sauer & Jonathan Schoenenberg
Geospatial Analysis of Intrasite Distribution Patterns at the Early Ahmarian site of Al-Ansab 1, Jordan

Since 2009, the site of Al-Ansab 1 in the Lower Wadi Sabra in Jordan had been excavated by the Collaborative Research Centre 806 "Our Way to Europe". The site is located on a sediment-mound at the confluence of two wadi-systems. It lies close to a high-quality raw material outcrop and a spring. Furthermore, the Wadi Sabra represents a corridor of movement between the Transjordanian Highlands to the East and the Wadi Araba to the West. In spring of 2020, the last excavation campaign had been carried out finalizing the excavation and documentation of a total of c. 56 square metres. Since 2015, a high-resolution documentation had been performed, providing three-dimensional data on all find categories as well as photogrammetric 3D-models of features. Throughout the excavation area, patches of blackened sediment, probably relating to fireplaces, had been observed. On first glance, the patches were also associated with concentrations of lithic artefacts, charcoal distributions and faunal remains. However, due to the documentation of more than 20,000 single plotted finds (Among them about 17,000 silex objects), distribution patterns remained unclear. This necessitated a geospatial approach to visualising and analysing both potential post-depositional alterations to the find-layer and the intra-site distribution of lithic and organic artefacts. Analysis showed that there are no indications of substantial post-depositional movement of the sediments and the artefacts therein. This corresponds to the geoarchaeological investigations, which showed low-energy deposition of sediments in the context of occupation and substantial erosional events only with the onset of the Holocene. The intra-site distribution of artefacts represents a repeated small-band occupation of the site with several discrete activity-zones. Most activity zones show a high level of task-diversity and no internal structuring of the occupied area. This situation had been observed at other Early Ahmarian locations such as Abu Noshra II on the Sinai-Peninsula. In our understanding, Al-Ansab 1 shows the repeated small-scale settlement of an oasis-like location in the Wadi Sabra exploiting raw materials and gazelles migrating between the highlands to the East and the lowlands to the West.

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Marcel Schemmel
The El-Wad points of Al-Ansab 1

One of the defining tool classes of the Early Ahmarian is the so-called El-Wad point which is defined by its backing along the lateral edges shaping the pointed tip (Shea 2013). Though they seem to be of great importance for this cultural period, their purpose remains unclear. Furthermore, the definition of this tool-class is comparably imprecise. In this poster-presentation we show our research regarding this matter, exemplified by the El-Wad points from the southern early Ahmarian site of Al-Ansab 1.
The site is located in Jordan, a few kilometers south of the ancient Nabataean city of Petra. First discovered in 1983, the site was excavated in several campaigns between 2009 and 2020 by members of the CRC 806. In the assemblage of Al-Ansab 1, El-Wad points constitute more than half of the entire toolset underlining their importance in the tasks carried out at this location.
The main goal of the work presented here is the detailed description of each completely preserved El-Wad point in the upper layer of the site. A special focus lies on the comparison between the location of the retouch on the individual object as well as its morphological characteristics. In addition, macroscopic indications of use-wear will be investigated. In this work, we compare the El-Wad points from Al-Ansab 1, upper layer, to other assemblages of the Northern and Southern Early Ahmarian, such as the sites of Ksar Akil, Boker A and Kebara. Those comparisons are mainly based on metric dimensions and are intended to emphasize the special standing of the Al-Ansab 1 assemblage within the early Ahmarian.

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Isabell Schmidt[1], Andreas Maier[1], Patrick Ludwig[2] & Andreas Zimmermann[1]
Possible effects of changes in insolation on Upper Palaeolithic populations

The phenological configuration of an ecosystem, i.e. the timing of periodic life cycle parameters of plants and animals, is influenced by many factors, including solar insolation. Insolation, measured in Megajule per square meter on the earth surface, has direct implications for the production of primary biomass, i.e. plants. If insolation varies in timing and/or intensity, such changes can have effects on the ecosystem, potentially also cascading across trophic levels. For migratory animals – frequently hunted during the Upper Palaeolithic in Europe – changes in plant phenology, such as delays in the onset of the growing season, can be especially critical.
Based on a simple model outlined in Maier et al. (accepted manuscript) we calculate the onset, end, length, and summed temperature of the growing season for twelve successive "insolation reference dates", covering the period between 43 and 15 ka cal BP and spanning from the 35° to 55° northern Latitude. The reference dates coincide with the boundaries and midpoints of the periods investigated in Project E1: Population Dynamics, CRC 806 "Our Way to Europe". For each of these periods, spatially differentiated estimates on human population size and density were obtained by applying the Cologne Protocol (Schmidt et al. submitted). Using a GIS based upscaling approach, site-density data from Western and Central Europe were interpolated to distinguish intensively occupied Core Areas from areas with minor or no settlement activity. Core Areas thus provide the minimum, but also the most robust evidence for human presence on large spatial and temporal scales.
We present a comparison of the spatial and temporal dynamics in human demography with changes in the timing and intensity of the growing season as inferred from changes in insolation. The outcome of this study suggests that for the spatially large-scale and long-term development of hunter-gatherer populations, in terms of both their numbers and distribution, solar insolation is an important driver.

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Jonathan Schoenenberg & Florian Sauer

Over the Hills and Far Away – Modelling Habitat Diversity in Upper Palaeolithic Site Catchments

From the smallest puddle to the largest lake topographic units shape and direct abiotic factors, which influence the distribution of plants and plant societies. On different scales, these landforms shape habitats and affect the bioeconomic potential of a landscape. As a broad range of abiotic factors is influenced by geomorphological variation in the landscape (precipitation, evapotranspiration or insolation), topography defines the framework for plant societies and the accompanying fauna. Consequently, the local topography has an indirect effect on biotic factors. This bioeconomic potential – meaning biotic resources potentially available by humans – can be evaluated using landforms as proxy. We calculate the diversity of landforms in modelled site catchments. This quantifies the variability of habitats and their potential influence on economic possibilities of hunter-gatherers. In this talk, we present preliminary results of modelling the bioeconomic resource potential for the Upper Palaeolithic (c. 42–10 ka BP) on a continental scale.
Initial results allow to quantify the difference between available habitats and landscapes that were settled. A diachronic comparison reveals temporal changes in interaction between humans and their surrounding environment, while synchronous comparison allows to identify regional trends. The data implies a correlation between the diversity of catchment composition and global climatic trends. During warmer periods of the last glaciation a preference for low variance in landform distribution could be observed. In turn, hunter-gatherers favoured higher diversity within catchments during colder phases such as the Last Glacial Maximum.
In this talk we give insights into the methodological framework of the project and discuss first implications on Upper Palaeolithic land use on the European scale. This may highlight possible interrelations between humans and their environment as well as changes through time.

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Svenja Schray & Harald Floss

New investigations on the Palaeolithic cave site Teux-Blancs (Saône-et-Loire, France)

The Magdalenian is a time period underrepresented in the *Côte Chalonnaise* compared to other periods in the region (Floss 2015). Our recent work on the cave site Teux-Blancs conducts an important share on the topic and spreads new light into the appearance of the Magdalenian in Burgundy. For the last few decades, the site was mostly recognized for its Middle Palaeolithic occupation, which brought up a small inventory of Levallois production and a single hand axe. But the site hasn't been in focus of much research since it was first excavated in 1913 (Mayet et al. 1921; Combier 1956; Gros & Gros 2005).
Therefore, we conducted new studies including a re-evaluation of the material of the old excavation. In addition, we excavated parts of the back-dirt sediments, increasing the number of known artefacts from the site by multiple times (Schray 2020; Schray et al. 2020; Schray et al. in prep). The new investigations could also gain insights into the excavation methods from 1913, separating the cave sediments after layers during the deposition on the outside of the cave, thus forming an inverse stratigraphy. Among the new finds especially osseous projectile points and backed bladelets have to be mentioned (Fig. 1). They indicate a site use of the Teux-Blancs cave during the Upper Palaeolithic within a hunting context. Unlike the Magdalenian, the Middle Palaeolithic is almost absent in the finds from the back-dirt sediments. This contribution presents the results of the excavation of the back-dirt in combination with the analysis of the inventory of the 1913 excavation.

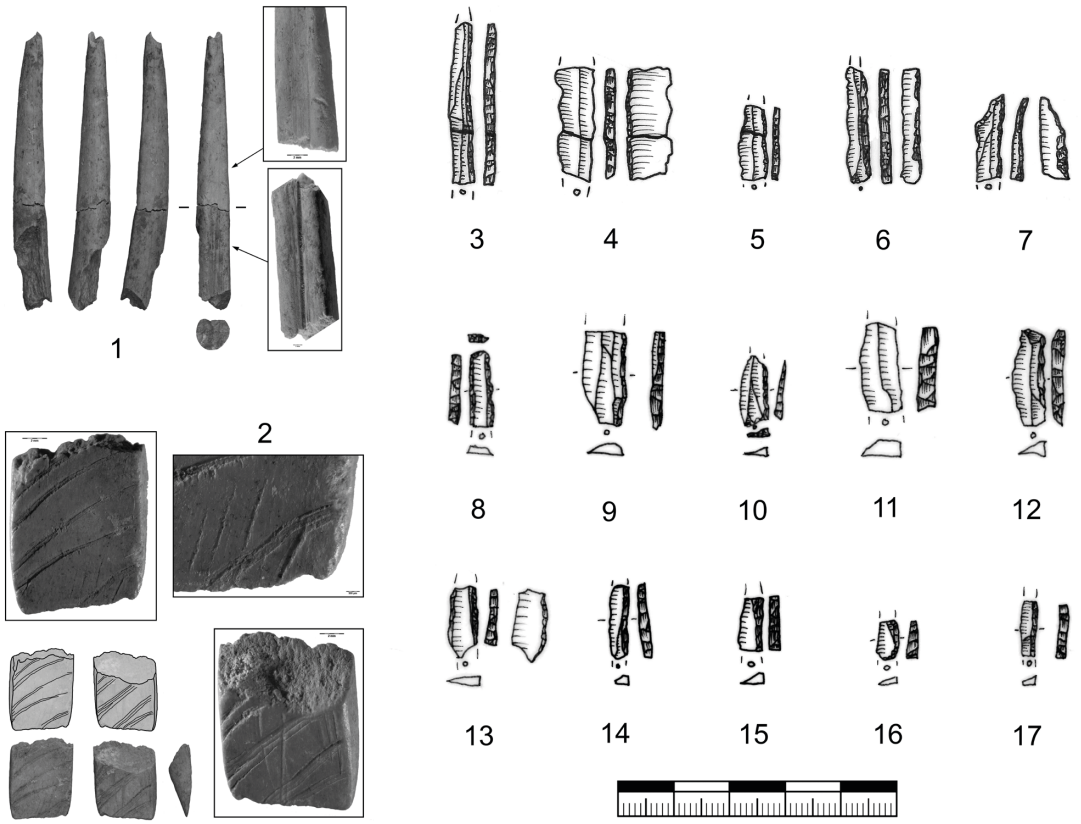

Fig.1: Selection of finds from the back-dirt excavation: 1 grooved antler point, 2 double-bevelled antler point base with striations, 3-17 backed bladelets (photos: S. Schray; drawings: B. Schürch).

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Benjamin Schürch[1], Sibylle Wolf[2], Patrick Schmidt[1] & Nicholas J. Conard[1],

Glycymeris in the Aurignacian of Vogelherd and their implications for mobility and identity

Molluscs represent an informative find category of the Palaeolithic. We describe the molluscs from Vogelherd, which provide us new insights into the mobility and social behaviour of the Aurignacian groups in southern Germany. The molluscs from Vogelherd were discovered during Gustav Riek´s excavation in 1931 (Riek 1934) and during the re-excavation of the site between 2005 and 2012 (Conard et al. 2016). To contextualize these finds we compared the molluscs with those known from other sites in Central Europe (e.g. Taborin 1993).
Most of the identifiable fragments belong to the Genus *Glycymeris* and originate from the Mainz basin 200 km to the northwest. This is one of the furthest long-distance connections known for the Upper Palaeolithic in Germany. In addition to the *Glycymeris* shells, Riek excavated a tool, that was also made from shell from layer IV of Vogelherd. Here we present a wide range of possible uses of the shells. We also discuss the potential use as ochre containers and pendants, while comparing the pieces from the Vogelherd with those from other sites, where a specific function could be assigned to the molluscs. In addition to the molluscs from Vogelherd, we also analysed *Glycymeris* shells from Hohle Fels, Geißenklösterle, Petersfels and Gnirshöhle for comparative reasons.

Fig.1: Perforated Glycymeris from HLKS layer of the re-excavation of Vogelherd (Photo: B. Schürch).

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Update about the elephants of Schöningen

The Lower Palaeolithic sites at Schöningen have until now provided isolated remains of at least ten elephants. In recent years, an almost complete elephant was discovered and excavated (reported at the HOT 2019). The analysis of the skeleton and its context has revealed a more detailed view of its taphonomic history and the potential for hominin exploitation of the carcass. It was found in an organic, slightly calcareous mud formed during a boreal forest steppe phase of the Middle Pleistocene Reinsdorf interglacial cycle. Aquatic microfossil analyses of levels corresponding to the skeleton find indicate similar summer temperatures and slightly colder winters compared to present day. In addition to the elephant skeleton, a series of footprints have been recently discovered in another part of the Schöningen excavation area ("Untere Berme", Schö 13II-2). The documentation and analysis of these footprints, together with the new analysis from the trampled surface excavated in 1994 (Thieme and Maier 1995), is currently undertaken in collaboration with the University of Rome.
The competences of *Homo heidelbergensis* as a hunter, capable of hunting prey as large as elephants, have often been debated (Serangeli 2016; Harvati et al. 2019). Several Lower and Middle Palaeolithic sites have been repeatedly used as examples of elephant hunts, e.g. Lehringen in Lower Saxony, Bilzingsleben in Thuringia, Gröbern in Saxony-Anhalt, Gesher Benot Ya'aqov in Israel, Aridos 1 and 2 as well as Torralba and Ambrona in Spain, Notarchirico in Italy and Ebbsfleet in England. The finds from Schöningen can offer new insights into the discussion on elephant exploitation in the Lower Palaeolithic. These new findings raise the question of how to present such findings in a museographic context.

Fig.1: 3D image based on the photogrammetry of the elephant tracks in the "Untere Berme" (Schöningen 13II-2). Graphic: Ivo Verheijen.

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Petr Šída

The current state of research on the Middle Paleolithic of Bohemia: an attempt at critical revision

The findings of the Middle Palaeolithic artefacts have appeared in Bohemia since the first half of the 20th century. The last list of sites comes from the early 1980s (Fridrich 1982). Since then, new sites have appeared on the one hand and older material can be revised on the other.
For the older phase of the Middle Paleolithic are typical industries of the evoleved acheulean (complex of sites in the vicinity of Bečov - Fridrich 1982; Fridrich - Sýkorová 2005, Stříbro - Břicháček - Šída 2015) accompanied by simpler acheulean-derived cobble industries (part of Mlazice assemblage – Svoboda 2018, Sedlec, Letky). The interglacial phases of the older and the start of Younger Middle Paleolithic are characterized by the mousteroid industries of the Levallois character (Bečov, Lobkovice) and the small-form industries (Radim, Mlazice, Ládví - Vencl - Valoch 2001). In the younger (Wurmian) phase of the Middle Paleolithic, we encounter both the mousteroid industries (Jislova Cave - Šída 2005) and the isolated findings of the Micoquien character (Slaný, Bolehošť, Jilemnice). The settlement of the caves of the Bohemian Karst (Fridrich - Sklenář 1976) is problematic. At a large part of the assemblages we can see considerable contamination with Upper Paleolithic artifacts.

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Gravettian settlement in Lubná, Bohemia

The largest concentration of Gravettian finds in Bohemia comes from the Lubná cadastre located in the western part of Central Bohemia. The first discoveries were made as early as 1890, when high school professor J. Kušta excavated almost all of site I. The first modern excavation took place in 1933 under the direction of J. Böhm at site II. Here, for the first time in Bohemia, a complete evaluable site plan of a Paleolithic station was obtained. In the 1960s, S. Vencl excavated sites III and IV (Šída et al., 2015), and most recently in 2012 and 2018, excavations were carried out at site VI (Wilczyński et al., in press).
The settlement cluster in Lubná copies the foot of the valley by the stream in eclipse from the westerly wind at an altitude of 350 to 380 m above sea level. Currently, 8 sites with Gravettian settlement have been identified, while station VI excavated recently seems to be the largest in space (Šída, 2016). At sites I, II and VI, fireplaces with stone paving were found in their vicinity, at site II a place of probable dwelling was identified. Dating puts local repopulation between 24 and 21,000 BP (28 – 25,5 ky cal BP), where presence of Gravettian occupation at the site VI falls most probably between 27.5 and 27.1 ka cal BP (Wilczyński et al., 2020).

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Human occupation of Central Europe during the Last Glacial Maximum: new evidence from the Epigravettian site of Stránská Skála IV

The Epigravettian site of Stránská Skála IV is a specialized horse hunting site located in Moravia (Czech Republic). It is one of several sites that provide evidence of human presence in Central Europe during the Last Glacial Maximum. Through a new program of radiocarbon dating and stable isotope analysis of the hunted horse remains we refine the chronology of the site and provide new insights into environmental conditions during human occupation. The new ultra-filtered AMS dates push back the age of the site from 22.8 - 21.1 cal BP to 24.1 - 23 cal BP. Bayesian modelling of the seven new radiocarbon dates indicates Stránská Skála IV predates Greenland Interstadial-2, a brief warm event recorded in Greenland ice-core chronology that has been associated with human activity at other Central European localities. Stable carbon, nitrogen and sulphur isotope data indicate conditions were cool and arid within an open landscape.

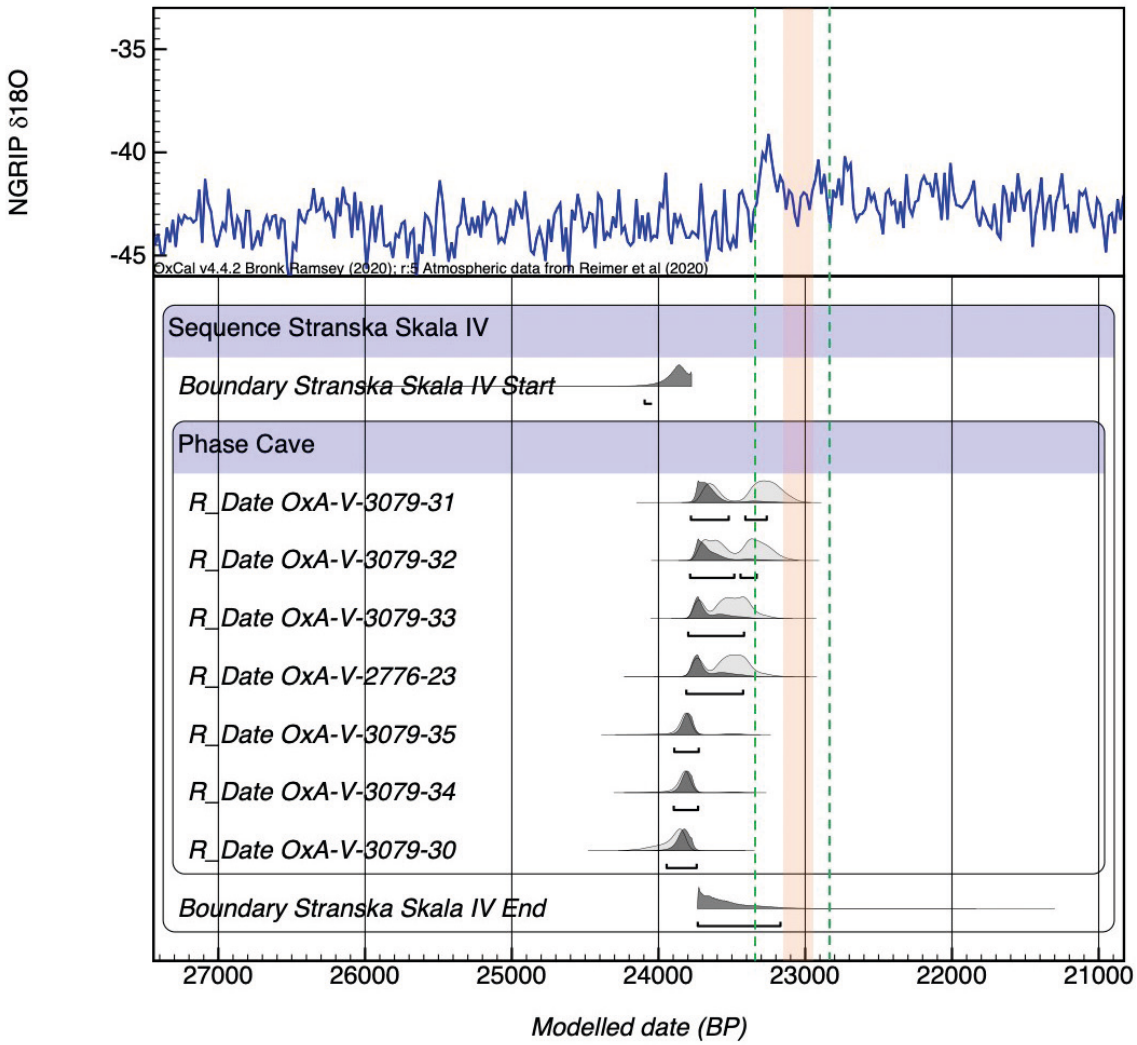

Fig.1: Calibrated radiocarbon dates made on horse bones from Stránská Skála IV. Calibration performed using OxCal 4.4 and the INTCAL20 dataset and shown against the NGRIP $\delta^{18}O$ record. Dashed green lines indicate duration of Greenland Interstadial 2, which is intermediated by Greenland Stadial 2.2 (orange shading).

Palaeotemperature reconstructions based on enamel oxygen isotope data indicate mean annual air temperatures of -0.1^{0}C (+/- 2.8), consistent with climate modelled temperature estimates for the region during the LGM. Together this data indicates humans were present at the site during pronounced cold conditions characterised by temperatures ~ 10°C below the modern-day average. This is in contrast to previous studies which have suggested conditions were relatively mild when humans were present at Stránská Skála IV.

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Yvonne Tafelmaier[1,2]

Analyses of late Middle Palaeolithic leafpoints from Southern Germany – design, production and function

In southwest Germany the transition from the Middle to the Upper Palaeolithic is not fully understood. While transitional industries are known from neighboring regions, the picture in the studied area is not clear. Some have postulated a gap (Conard & Bolus 2003) between the latest Middle Palaeolithic and the earliest Upper Palaeolithic with its rich Aurignacian occupations and spectacular finds of figurative art. However, quite late absolute age estimations for latest Middle Palaeolithic horizons e.g. at Hohlenstein-Stadel (Kind 2019) might hint at a continuity in human presence in the region. Moreover, the character, chronology and significance of assemblages containing leafpoints are still highly debated matters within this context. Do leafpoints belong to the regular repertoire of late Middle Palaeolithic hunter-gatherers in Southern Germany? Or do they represent an innovative boost of hunter-gatherers at the very end of the Middle Palaeolithic?
The presentation will give insight into empiric analyses of leafpoints from assemblages in Southern Germany (Haldenstein, Mauern, Bockstein). Technological data on leafpoint design, production and function are presented and discussed against the background of the above raised issue.

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Sima de las Palomas de Teba (Andalusia/ Spain) – new data on hunter-gatherer land use during the late Pleistocene of Southern Iberia

Since 2010 a Spanish-German team is conducting field work, partially in the framework of the CRC 806 'Our way to Europe' at a recently discovered site in the Province of Málaga: The Sima de las Palomas de Teba (Kehl et al. 2016). Situated within the Cretaceous limestone of the Sierra de Teba-Peñarrubia, the site contains an at least 7m-thick stratigraphic sequence. Its chronology reaches from the Holocene to at least 60 kyrs BP with Middle Palaeolithic occupations rich in archaeological finds at the bottom of the stratigraphy. Various research questions can be addressed such as the transition from the Middle to the Upper Palaeolithic, the long survival of Neanderthals in the southern part of Iberia as well as potential changes in settlement patterns in the late Pleistocene. The poster gives an introduction to the site and presents new data on chronology, behavioral variability, site function and mobility patterns.

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Elaine Turner[1] & Petr Neruda[2]
From the hunt to the cave: defining Neanderthal subsistence during the Middle Palaeolithic at Kůlna Cave (Moravia, Czech Republic)

Kůlna Cave is one of the largest Palaeolithic sites in the Moravian Karst. Excavations from 1961 to 1976 revealed repeated settlement of the site from the Middle Palaeolithic through to the Epi-Magdalenian, attesting to its role as a focal point in the Palaeolithic landscape of this region, for over 150 000 years. The cave has also produced rich evidence of Neanderthal occupations from a series of levels spanning the Penultimate Glaciation (MIS 6), Last Interglacial (MIS5) to the interpleniglacial (MIS3).
In a co-operative project between the Archaeological Research Centre at Monrepos and the Moravian Museum, faunal remains from Level 11 at Kůlna, attributed to the Last or Eemian Interglacial and/or to two oscillations at the beginning of the last glaciation, were analysed. Neanderthal hunting strategies at Kůlna during this period focussed primarily on large herbivores and, in this poster, we describe and compare aspects of the procurement and utilisation of horse, large bovines, red deer and large cervids at this site. Looking at the representation of these animals, and their skeletal parts, minimum numbers of individuals and age structures, evidence of Neanderthal butchery and distribution of the remains within the cave, we attempt to reconstruct the ways in which these animals were hunted, transported to the cave and utilised.

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Pavlo Vasyliev[1], Andreas Maier[2], Ivan Khoptynets[3], Vitalij Tkach[4] & Victor Chabai[1]
New multilevel site Myrohoshcha I at Volyn (Western Ukraine)

The multilevel open-air site Myrohoshcha I (Rivne region, Dubno district) is situated on the third high terrace over the wide valley of Lypka River and is oriented towards the north. First archeological investigations were carried out by M. Ostrovskyi in 1937; in 1960-1961, V. Savych dug two test-pits which yielded only few lithic artifacts. In 2011, V. Piasetskyi opened a test pit (1×3 m) where he documented two archeological levels. In 2018 and 2019, investigations at the site have been resumed in the framework of DFG project "Between East and West. Social Networks and Environmental Conditions before, during and after the Last Glacial Maximum in Volhynia (Western Ukraine)". The stratigraphy was studied in a 4 sq. meter test pit. The 3,65 meters deep stratigraphic sequence consists of 28 lithological layers. The Pleistocene sediments are represented by loess and silt deposits, within which ten archeological levels were found. The finds of level 1 accumulated in loess and contain a few artefacts; level 2 accumulated in mixed deposits and contain 194 artefacts. Level 3-5 accumulated in silt deposits with sterile layers. The collection from level 3 is represented by 3810 artefacts, 16 fragments of unidentifiable bones, and numerous small pieces of charcoal. The tool-kit contains burins, end-scrapers, a backed point on a microblade, fragments of backed bladelets, and retouched blades. There are 10 radiocarbon dates on charcoal available for level 3, which place the occupation roughly around 32 ka calBP. The collection from level 4 is represented by 392 artefacts and 5 fragments of unidentifiable bones.

The tool-kit contains end-scrapers and retouched blades and flakes. For level 4, 2 radiocarbon dates are available, indicating a calendar age of roughly 33 ka calBP. The collection from level 5 is represented by 169 artefacts, 7 fragments of unidentifiable bones, and 1 pieces of burned bone. The tool-kit contains retouched blades and flakes. Level 6 accumulated in silt deposits, the collection is represented by 639 artefacts, 16 fragments of unidentifiable bones, and numerous small pieces of charcoal. The tool-kit contains end-scrapers and retouched flakes. The finds of level 7 accumulated in sand and contain only few artefacts. Level 8 accumulated in thin silt deposits. The collection is represented by 52 artefacts, 1 fragment of unidentifiable bones, and numerous small pieces of charcoal. Level 9 accumulated in silt deposits, the collection is represented by 197 artefacts, 1 fragment of unidentifiable bones, and numerous small pieces of charcoal. The tool-kit contains retouched blades and flakes. Level 10 accumulated in silt deposits, the collection is represented by 77 artefacts, 3 fragments of unidentifiable bones, and numerous small pieces of charcoal. The dates from levels 3 and 4 are in a good agreement with the chronological frame of the early Gravettian in Western Ukraine. Given the good stratigraphic resolution and presence of charcoal throught the sequence (further dates are underway), Myrogoscha I has the potential to become a key-site for understanding the evolution from the late Aurignacian to the early Gravettian in the region of Volhynia.

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Flavia Venditti[1] & Ran Barkai[2]

An overview on the use-wear and residue data from Layer C3 at the late Lower Paleolithic site of Revadim (Israel)

More and more often, the study of material culture in archeology is conducted with an interdisciplinary perspective which integrates different approaches and scientific disciplines for understanding past human behaviors. In the field of the use-wear analysis, the integration of the residue observations has greatly increased the reliability of the functional interpretations, especially on early archeological assemblages.
Here, we show the potential of combining chemical and elemental spectroscopic analyses of ancient residues to the interpretation inferred from the use-wear analysis and experimental observations at the late Lower Paleolithic Revadim site. The outstanding preservation condition of organic and inorganic animal residues adhering to the lithic surface of tools in area C layer 3 allowed their morphological characterization, later cross-checked through two independent and non-destructive techniques: the Fourier Transform Infrared spectroscopy (FTIR) and the Energy Dispersive X-ray spectroscopy (EDX). The presence of several micro residues of hydroxyapatite, adipocere, animal fibers, coupled with the evidence of edge scarring and polish allowed to distinguish different mode of use, according to the technological and morphological features of analyzed specimens. We found that the chopping tools were used in thrusting percussion on hard and medium materials such as bone, likely for marrow extraction; while small flakes were used to mainly performed fine cutting activities on soft and soft to medium materials like animal fleshy tissues. The methodology used in this work proved to be an effective approach to reveal the feasibility and flexibility of the Revadim hominins in producing and using a diversified set of implements, including heavy and light-duty tools, to be used for targeted tasks during specific stages of the carcass animal processing.

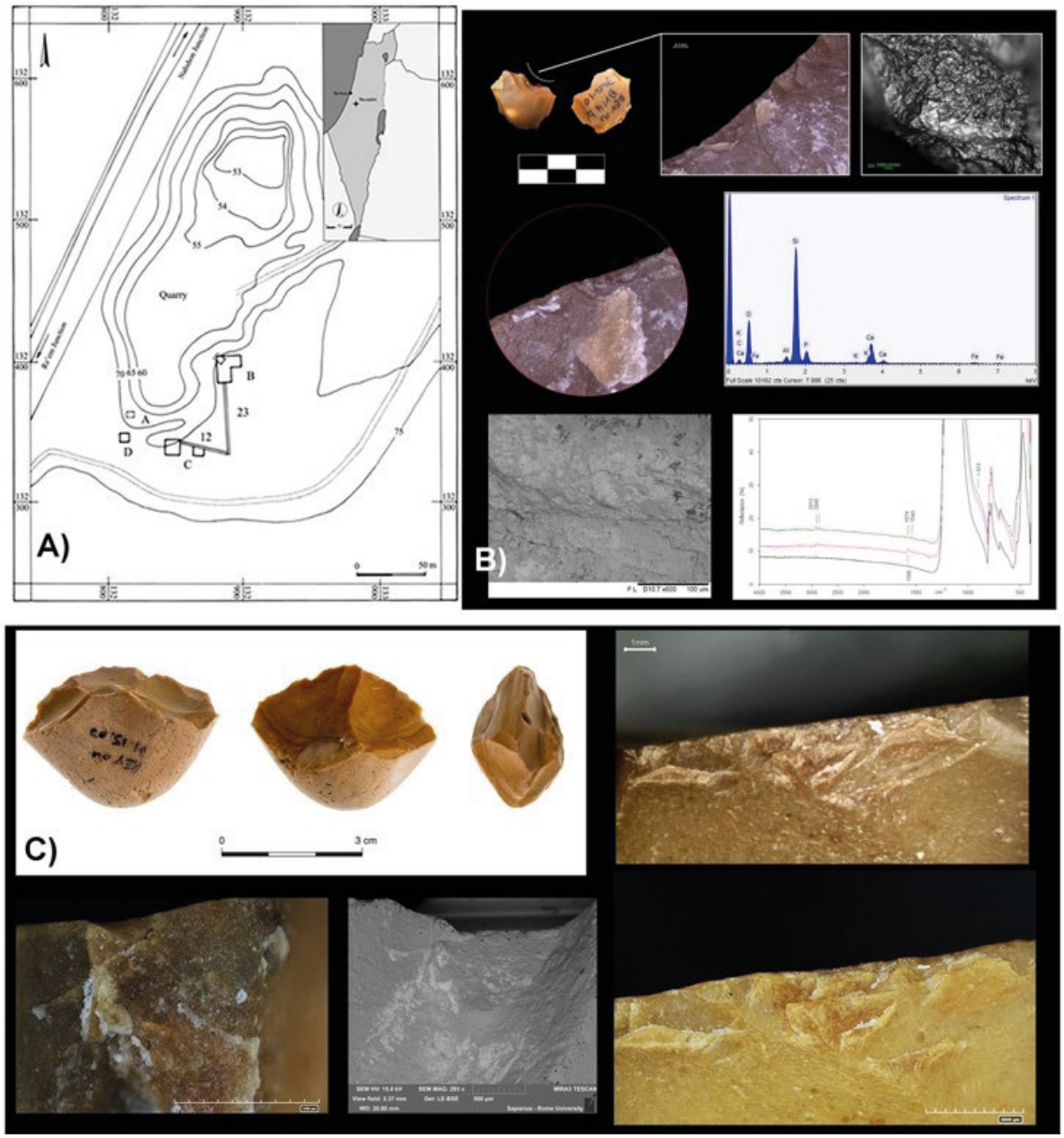

Fig.1: Use-wear and residue analysis on artefacts from Revadim (Israel).

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Christian Waldenheim, Thomas Weber[1], Klaus-Dieter Meyer, Stefan Wansa & Tobias Lauer[2]

Lithics from the ice – a new Older Palaeolithic inventory from glacial sediments near Haldensleben, Saxony-Anhalt, Germany

The region between the Haldensleben districts Haldensleben II / Alt-H., Haldensleben III / sanatorium, and Hundisburg with its famous *Parkkiesgrube* (one of the first known Older Palaeolithic sites in Germany) is covered by a "formation of the penultimate (Saale) Ice Age, sand, mostly dry, e. g. on clay marl, boulder clay, pre-glacial gravel, middle oligocene sand, middle oligocene clay, porphyrite or lower carbon (Kulm)" – following Wiegers (1928: map; cf. p. 22). Some hundred meters south from the remains of the Medieval *Templerburg* not far from the spring *Nonnenspring* agricultural ploughing has brought to light flint artefacts which have been collected by one of us (C. W.) from the surface – up to now more than 200 pieces from an area of 400 x 200 m. The largest part of these pieces are intensively brown patinated, weathered and rolled – like the unworked raw material flint pieces from the same area. Only few "fresh", more or less unpatinated or sometimes slightly white patinated artefacts (including several blades and a Mesolithic core axe) may reflect a Late Pleistocene or Holocene settling of the area but the "fresh" raw material for these pieces has not been found here.
Interestingly, the patinated pieces from Wichmannsdorf – "gravel artefacts" comparable with the finds from the Central German Pleistocene gravel sediments like Wallendorf, Markkleeberg and – in the neighborhood – Bertingen – show typo- and technological not to the expected (Upper) Saalian Acheulean technocomplex ("with Levallois technique") but rather to Lower Palaeolithic assemblages like Wallendorf, Wangen, Memleben (and Clacton-on-Sea) – cf. Lauer & Weiss 2018. Typologically, we mostly find pieces with rough edge retouch (never fine flat face working). Even the few bifaces only show several large retouch negatives, which turn them in the form of small points, pics or "hand axes".
From the technological point of view, the flake measurements (form quotients and inner flaking angles) are reminiscent of the clumsy pieces from the "Clactonoid" Lower Palaeolithic – and not of the flatter, often more elongated flakes from the Middle Palaeolithic (including Acheuloid) inventories. When compared to the Linear Discriminant Function values of a hundred randomly selected flakes from Wallendorf and from Markkleeberg, which had been elaborated to separate these two inventories (Weber 2006), Wichmannsdorf occupies a position a little bit nearer to Wallendorf (and Clacton-on-Sea) than to Markkleeberg and Hundisburg (fig. 1). Technologically, the Wichmannsdorf pieces occupy a more or less "intermediate" position between the "Clactonoid" and the "Acheuloid" flakes.

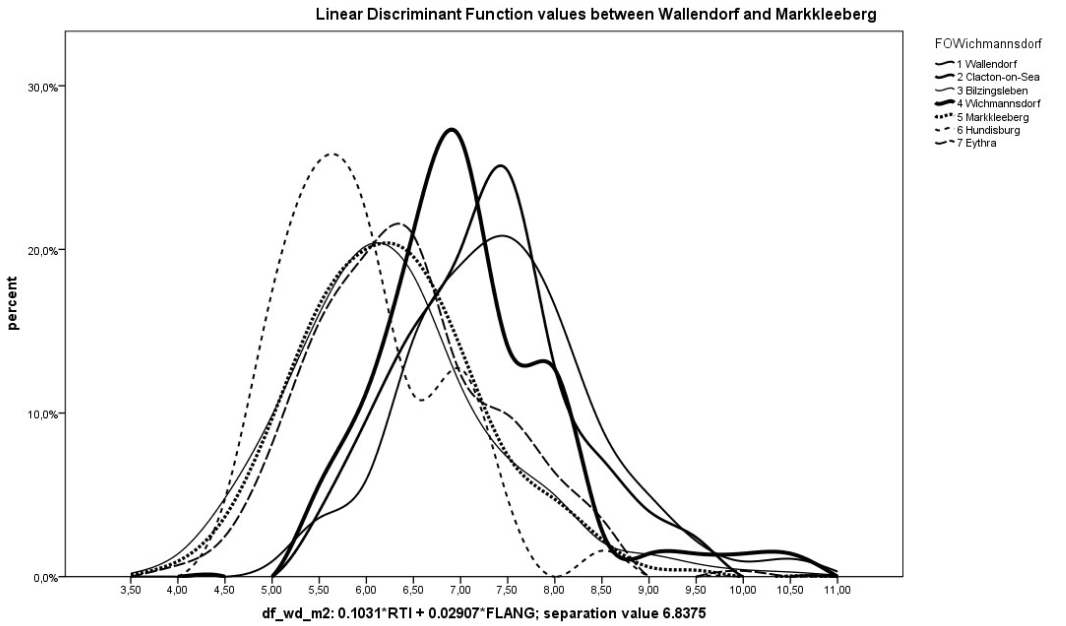

Fig.1: The position of the Wichmannsdorf flakes between the „Clactonoid" and the "Acheuöoid" technocomplexes: measured with the Linear Discriminant Function of the flakes found in Wallendorf and Markkleeberg.

For this reason we performed a prospection cut to analyze the sediment embedding the plowed artefacts (and the lying stratum). Under the small boulders, we found a large number of quartz, often weathered flint pieces, reflecting perhaps a Drenthe Glacifluviatil with fluviatile gravels (?). Perhaps these fluviatile components with their archaeological contents date back much further than to the time span more or less immediately before the last Drenthe glacial events. They might have originated in the Early Post-Elsterian fluvial activities in the older stages of the Saalian *sensu lato* – a glacial cycle which lasted over Central Europe for no less than 300 ka between 440 and 130 ka ago (Lauer & Weiss 2018). From the viewpoint of the indicator erratic counts of the coarse gravel fraction (diameter 20 … 60 mm) leading with the TGZ method to a *Theoretisches Geschiebezentrum* with co-ordinates 15.29° W / 58.32° N (comparable to the uppermost Lower Saxonian Drenthe samples), these meltwater sands belong to the "Upper" (Latest?) Drenthe *sensu* Meyer in NE-Lower Saxony (Hoffmann & Meyer 1997). Moreover, we are still waiting for dating results for OSL samples taken from the digger cut.

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New chronological constraints for the Lower Palaeolithic site of Cueva Negra del Estrecho del Río Quípar (Caravaca de la Cruz, Murcia, Spain): preliminary ESR dating of the late Early Pleistocene fauna

Combined closed series uranium-series electron spin resonance dating is being applied currently to a series of fossil herbivore teeth (*Equus* cf. *altidens* and *Stephanorhinus etruscus*) from several stratigraphical units of the final Early Pleistocene 5 m-deep sedimentary sequence at the Palaeolithic site of Cueva Negra del Estrecho del Río Quípar, in the Segura drainage basin, in SE Spain. Two samples were taken from specimen CN1511, a left maxillary 1st or 2nd molar of *Equus* cf. *altidens* (ID: CN-09152) excavated in sedimentary stratigraphical Complex 3-1, about halfway down the 5 m-deep sedimentary sequence. Tooth samples were pre-screened using high-resolution laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). These uranium-series analyses showed no evidence of uranium leaching from the dental tissues, suggesting the suitability of the samples for ESR dating. Employing both Combined U-series-ESR (US-ESR) and Combined closed system U-series-ESR (CSUS-ESR) approaches (Grün et al., 1988), the age of the samples lies between the Combined US-ESR age of 406±40 ka and the Combined CSUS-ESR age of 1446±310 ka (Walker et al., 2020).
Magnetostratigraphy (Scott & Gibert, 2009) found reversed polarity throughout the sedimentary deposits, providing a minimum age constraint of 772 ka (when the reverse polarity of the Matuyama chron, 2.558-0.772 Ma, gave way to Brunhes normal polarity).

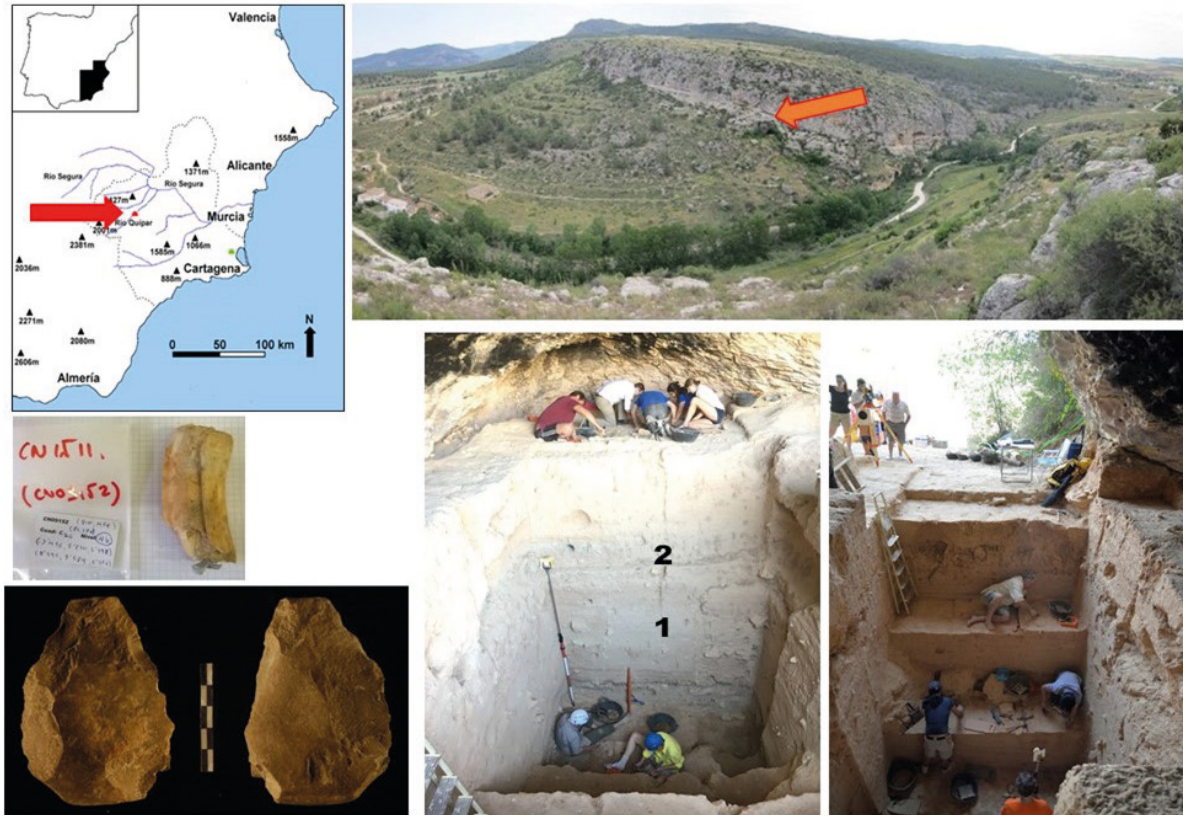

Fig.1: Cueva Negra del Estrecho del Rio Quipar. Location, finds and excavation.

Biochronological considerations are consistent with a final Early Pleistocene age because the palaeontological assemblage includes both characteristic large fauna (e.g., the cervids *Dama* cf. vallonnetensi, *Megaloceros novocarthaginiensis, Stephanorhinus etruscus*), and small mammals *(Victoriamys chalinei, Iberomys huescarensis, Mimomys savini, Pliomys episcopalis, Stenocranius gregaloides, Terricola arvalidens;* López-Jiménez et al. 2020*)*. They indicate a time after the end (ca. 1 Ma) of the Jaramillo subcrhon. They occur throughout the 5 m-deep undisturbed sedimentary sequence which was deposited by intermittent fluviolacustrine alluviation, during a short period of geological time (plausibly MIS21; Angelucci et al. 2013) and has provided herpetological, avifaunal, and pollen evidence indicating moist, temperate environmental conditions. Magnetostratigraphy, biochronology and numerical dating are compatible with a late or final Early Pleistocene age for Cueva Negra, between 1 and 0.772 Ma. Ongoing Combined US-ESR and Combined CSUS-ESR of other fossil herbivore teeth will enable further definition of chronological constraints at Cueva Negra.
Excavation at Cueva Negra has uncovered a bifacially-flaked Acheulian handaxe, a complex industry of small artefacts, including flakes removed by repetitive flaking of small cores and pieces with retouched edges, as well as evidence of combustion in a deep level (Walker et al. 2013). There are no hominin fossils (anterior teeth of a small bear found in loose surface sediment in the 1990's were mistaken for Neanderthal teeth and wrongly appear as such in some publications, but excavation in 2019 of a typically ursid lateral 3rd incisor indicates that all the teeth are ursid). Given contemporaneity of the Cueva Negra sedimentary deposits with *Homo antecessor*, dated to ca. 0.95-0.772 Ma (Duval et al. 2018) at the Gran Dolina in the Sierra de Atapuerca in northern Spain, an intriguing question is whether we owe the Palaeolithic assemblage and combustion at Cueva Negra to that species.

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Neanderthal cranial remains and elements of the axial skeleton from the Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

The site of Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain) attests to Neanderthal presence in SE Spain until 60,000-40,000 BP according to OSL, U-series and ^{14}C dating. Cabezo Gordo is a hill of marble overlooking the Mediterranean Sea. The accidental find by a spelaeologist in 1991 of the fused maxillae and mandible of a Neanderthal (SP1) led to scientific research at the site. Excavation is on-going in the highest part of an 18-m deep sedimentary column within a natural karst shaft where mining took place ca. 1900. Excavation has revealed 3 depositional phases. The highest sediments (Phase 3) followed the brecciated "conglomerate A" (Phase 2) of marble rocks to which Neanderthal bones were cemented by CaCO3, including skeletal elements in anatomical connexion of the woman "Paloma" (SP96), a child (SP97), and another adult (SP92), whose bodies were covered by the rocks (perhaps on purpose). Paloma" (SP96) was a young woman barely 20 years old: the SP97 child was 5 or 6 years old. They lay above the thin, albeit hard bed of "conglomerate B" dated to 68,000-65,000 BP by U-series. Below it, excavation a depth of 3 metres of Phase 3 sediments, dated by OSL to 130,000-90,000 BP (MIS5), has provided 4 Neanderthal teeth and a mandibular ascending ramus. Excavation will continue in 2020. All three phases contain Mousterian stone artefacts and abundant faunal remains.

Fig.1: Neanderthal cranial remains, Sima de las Palomas del Cabezo Gordo.

The poster presents a summary of the individual Neanderthal cranial remains from Sima de las Palomas del Cabezo Gordo, with their identification numbers, ID; laterality or sidedness, LAT (D = right-side, I = left-side), and state of conservation, CONSERV (where CO = complete specimen, F = fragment). Only very few items show traces of burning (the cause of which is unknown). The excavated skeletons of SP96 and SP97 were found in anatomical connexion and have skulls with mandibles, which is also the case with SP1 (found by a spalaeologist in 1991). Fragments of another 8 mandibles correspond to as many Neanderthals – adults, juveniles, children and a baby. Therefore the mandibles correspond to 11 individuals in all. Other bones and teeth indicate another 4 individuals. Mandibular and maxillary alveoli retain 47 teeth, and another 65 isolated teeth have been recovered (see Trinkaus & Walker, 2017, for more information). The total number of different bones (or fragments thereof) identified to date is 232. The poster includes also some elements of the vertebral column and rib cage.
Cementation by CaCO3 of many bones excavated at the site requires the removal of adherent breccia by use of vibroscalpels powered by compressed air (which, being non-invasive, supersedes outdated methods of cleaning by repeated cycles involving dilute acetic acid followed by washing to raise the pH and subsequent impregnation with consolidants). By indicating precisely where bone lies hidden within a matrix of breccia, computer-assisted tomography undertaken beforehand, facilitates cleaning with vibroscalpels.
This methodology has been of great help in revealing the elements of the articulated Neanderthal skeletons, such as the hand bones within breccia cemented to the forehead of the child SP97. The articulated skeletons of both the child and the woman "Paloma" SP96 were found at excavation with their elbows flexed and hands held up to their heads – a position no doubt produced before rigor mortis developed, though whether before death or by arrangement of the cadavers immediately post mortem cannot be ascertained. Presence near SP97 not only of flint flakes but also of two leopard paws with the bones in anatomical connection (unlike almost all other animal bones excavated) possibly reflects Neanderthal attention, and a not altogether implausible conjecture is that the cadavers of SP92, SP96 and SP97 were covered with rocks on purpose, in order to deter leopards and hyaenas from scavenging.

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Neanderthal post-cranial skeletal remains from the Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain)

The site of Sima de las Palomas del Cabezo Gordo (Torre Pacheco, Murcia, Spain) attests to Neanderthal presence in SE Spain until 60,000-40,000 BP according to OSL, U-series and ^{14}C dating. Cabezo Gordo is a hill of marble overlooking the Mediterranean Sea. The accidental find by a spelaeologist in 1991 of the fused maxillae and mandible of a Neanderthal (SP1) led to scientific research at the site. Excavation is on-going in the highest part of an 18-m deep sedimentary column within a natural karst shaft where mining took place ca. 1900. Excavation has revealed 3 depositional phases. The highest sediments (Phase 3) followed the brecciated "conglomerate A" (Phase 2) of marble rocks to which Neanderthal bones were cemented by CaCO3, including skeletal elements in anatomical connexion of the woman "Paloma" (SP96), a child (SP97), and another adult (SP92), whose bodies were covered by the rocks (perhaps on purpose). Paloma" (SP96) was a young woman barely 20 years old: the SP97 child was 5 or 6 years old. They lay above the thin, albeit hard bed of "conglomerate B" dated to 68,000-65,000 BP by U-series. Below it, excavation a depth of 3 metres of Phase 3 sediments, dated by OSL to 130,000-90,000 BP (MIS5), has provided 4 Neanderthal teeth and a mandibular ascending ramus. Excavation will continue in 2020. All three phases contain Mousterian stone artefacts and abundant faunal remains.
The poster shows the principal bones identified of SP96, SP97 and SP92. As well as the articulated skeletal remains of these three individuals, the site has provided many other bones and teeth, such that the minimum number of Neanderthal individuals discovered to date is around 15; mandibular and cranial elements alone correspond to 11 different individuals, including babies, children, juveniles and adults; other bones and teeth indicate a further 4 individuals. "Paloma" SP96 is represented by >85% of the principal skeletal components. The appendicular skeleton is remarkably complete, though the ankle and foot bones are lacking. Measurements of limb bones and the vertebral column enable her stature to be measured accurately: at 1.5 metres she is among the shortest Neanderthal adults known. Her pelvis is the most complete Neanderthal adult female pelvis in existence. Metrical analysis of her skeleton shows that it presents the typical robustness of Neanderthals (see References for details).
Cementation by CaCO3 of many bones excavated at the site requires removal of adherent breccia by use of vibroscalpels powered by compressed air (which, being non-invasive, supersedes outdated methods of cleaning by repeated cycles involving dilute acetic acid followed by washing to raise the pH and subsequent impregnation with consolidants). By indicating precisely where bone lies hidden within a matrix of breccia, computer-assisted tomography undertaken beforehand, facilitates cleaning with vibroscalpels. This methodology has been of great help in revealing the elements of the articulated Neanderthal skeletons.

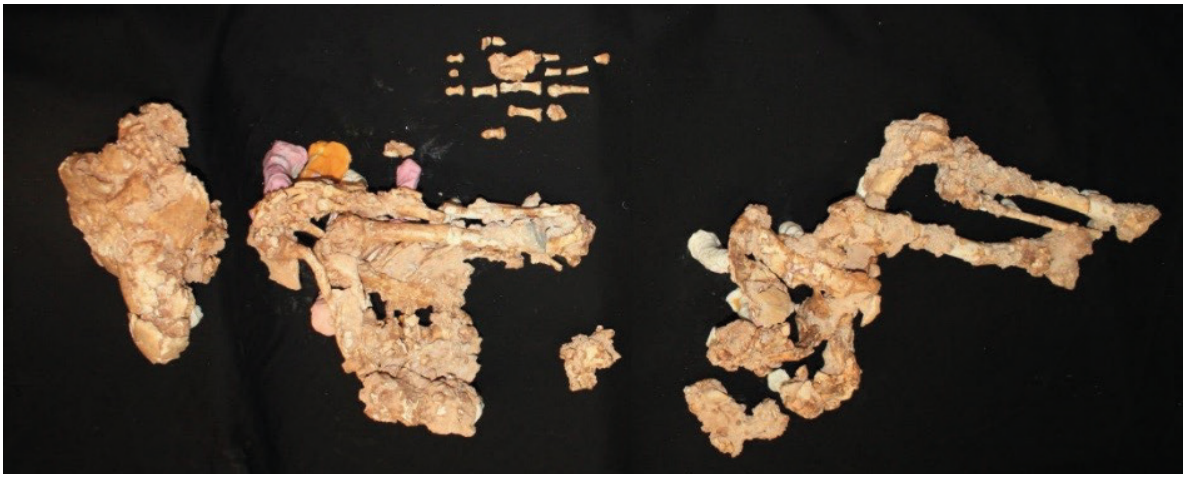

Fig.1: Neanderthal post-cranial skeletal remains, Sima de las Palomas del Cabezo Gordo.

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Marcel Weiss[1,2], Davide Delpiano[3] & Thorsten Uthmeier[1]
From North to South, from the cave to the open: a diachronic 3D geometric-morphometric comparison of late Middle Paleolithic Keilmesser from Lichtenberg and Sesselfelsgrotte

The bifacial backed knife or *Keilmesser* is the most prominent tool type of the Central European Micoquian (Bosinski 1967, 1968) and its presence in late Middle Paleolithic assemblages is defined as a necessary precondition for an attribution to the eponymous '*Keilmessergruppen*' (Mania 1990; Veil et al. 1994). Our recent studies have shown that *Keilmesser* represent a rather flexible knife concept that was equally applied to unifacial and bifacial tools (Weiss et al. 2018; Delpiano and Uthmeier 2020). However, the bifacial asymmetric tool, i.e. the Keilmesser in strict sense, is also interpreted as 'highly mobile' cutting tool (Delpiano and Uthmeier 2020) with edge configurations that enable a long use-life together with edge angle maintenance during frequent resharpening (Jöris 2001; Iovita 2010; Weiss 2020). Furthermore, social transmission related to the way of making a specific tool (Uthmeier 2016) and individual learning, as well handedness (Jöris and Uomini 2019), may be coded within the bifacial Keilmesser. Besides these behavioral aspects, other aspects like raw material or the specific site settings may also contribute to the frequently observed morphological variability of *Keilmesser*.
In the present study, we analyze the influences that chronology (MIS 5a vs. MIS 3), raw material, distinct occupations, as well as site type (open-air vs. cave) may have on *Keilmesser* variability. To this end, we use a set of methods from 3D geometric morphometrics, like shape and edge angle analyses, combined with technological observations documented by working-step analyses to compare *Keilmesser* from the MIS 5a open-air site Lichtenberg, Lower Saxony/ Germany and the MIS 3 open-air site Sesselfelsgrotte, Bavaria/ Germany.

Our results show:
(1) that there is not an obvious chronological separation in terms of variability (i.e. Lichtenberg Keilmesser overlap with Sesselfelsgrotte Keilmesser on an assemblage level)
(2) that the main aspects of variability within the dataset of Keilmesser from the two sites are elongation, thickness, and tip symmetry
(3) that distinct raw material properties were selected for elongated and triangular shapes, in parallel with raw materials used for both morphological variants
(4) that raw material preferences exist for flat and thick Keilmesser in Sesselfelsgrotte
(5) the presence of shape variability of Keilmesser between distinct occupations in Sesselfelsgrotte
(6) that the Keilmesser from the open-air site Lichtenberg have a generally flatter shape than those from Sesselfelsgrotte
(7) that the Keilmesser from the cave site are more reduced than the Keilmesser from the open-air occupation.

In general, we can draw the conclusion that the Keilmesser incorporates several aspects of variability and resulting levels of interpretation with increasing complexity. Encoded may be: raw material, edge angle maintenance and resharpening, occupation type, site type, mobility, as well as other behavioral aspects, like functional diversity, cultural transmission, handedness, or learning (Jöris and Uomini 2019).

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Living on the edge – Neanderthal presence in changing environments from MIS 5e to the MIS 5a/4 boundary at the northern limit of their habitat in Central Europe
Part I: Sedimentology and Dating *(Presenter: Michael Hein)*
Part II: Archaeology *(Presenter: Marcel Weiss)*

Are Neanderthals adapted to cold environments? This question has been a matter of debate for a long time in prehistory, biology and physical anthropology (see e.g., Aiello and Wheeler, 2003; Churchill, 2008; Rae et al., 2011; Skrzypek et al., 2011; White and Pettitt, 2011). One way to address this debate is to analyze Neanderthal occupations at the northern extreme of their habitat and to contextualize these occupations using detailed paleoenvironmental reconstructions within a high-resolution chronological framework.Since 2017, we are conducting fieldwork at the late Middle Paleolithic open air site of Lichtenberg, Lower Saxony/Germany (Veil et al., 1994). Situated at latitude 52°55′ N, Lichtenberg represents a Neanderthal site at the potential northern limit of their geographic range. Our excavation has revealed a multi-layered sequence containing deposits from MIS 5e to the MIS 5a/4 boundary, making this site an ideal case study to investigate Neanderthal population dynamics at the "far North". Human occupations at Lichtenberg are associated with a paleo-lake shore, and we are able to trace climatic shifts within a long and high-resolution sequence of organic and clastic sediments. Our research project combines archaeological investigations with detailed sedimentological, chronological and paleoenvironmental studies of the find bearing and non-find bearing layers of the sequence. Our current results are based on geomorphological surveys, geophysical prospection, vibracoring, luminescence dating, palynology, micromorphology and granulometry. The sediments preserved at and around the Lichtenberg sites document a complex sequence of climatic, geomorphic, vegetation and hydrological changes. These high-resolution paleoenvironmental data in connection with robust luminescence ages generate valuable information on the landscape context of the archeological find layers embedded within these deposits.
We here present:

(1) a complex sedimentological and high-resolution paleoenvironmental record, documenting various hydro-climatic and vegetation shifts, and geomorphic responses
(2) the northernmost multilayered site with subsequent Neanderthal occupations during the Eemian interglacial, the Brørup interstadial, and during the transition from the Oderadde interstadial to the Schalkholz stadial
(3) typologically different stone tool industries in layers formed in climatically warmer and colder periods, allowing for inferences about behavioral adaptations to changing environmental conditions.

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Settlement patterns and land use in Iberia in the Late Pleistocene. Testing different approaches

Repeated rapid climate change during MIS 3 and 2 are supposed to have strongly affected hunter-gatherer lifeways, their demography and settlement pattern in Europe. To be able to recognise possible effects, a sound archaeological database and solid palaeoenvironmental data are required. The Iberian Peninsula offers both. In the framework of the CRC 806's "Our Way to Europe", we have tested various approaches to understand human response to climate change in the Westernmost Mediterranean.
Here we analyse two crucial time slices, the transition from the Late Middle Palaeolithic to the Early Upper Palaeolithic and the LGM in the search of detectable changes in settlement pattern and land use. Our large-scale approach uses archaeological site data in combination with various GIS-tools and palaeoenvironmental reconstruction to trace changes of human land use over time and related population fluctuations. We can show that both clear chronological and clear regional differences in land use can be identified.

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Christina-Maria Wiesner

Settlement patterns of the Middle Palaeolithic in Southern Germany: A GIS-supported predictive model for sites in Bavaria and Baden-Wurttemberg

Southern Germany harbours some of the most well-known Middle Palaeolithic sites in Central Europe, among them the Sesselfelsgrotte, Klausenhöhlen-complex, Bocksteinschmiede, Speckberg, Hohler Stein and Großes Schulerloch. Offering a variety of landscapes and altitudes in a fairly wind protected and continuously glacier-free zone, this area has often been discussed as a central hub for Middle Palaeolithic migration during the colder periods of MIS 5 to MIS 3, when human groups had to repeatedly retreat to milder refuge areas in the southern part of East- and Western Europe (Jöris 2004). The extent of this migration was poignantly demonstrated by recent analysis of Neanderthal inventories from the Altai Mountains, Southern Russia, that show techno-morphological similarities to Middle Palaeolithic industries from Central and Eastern Europe – particularly to those of the Sesselfelsgrotte in Bavaria (Kolobova et al. 2020). To contribute to the understanding of the Middle Palaeolithic settlement patterns in this "junction" between West and East and to facilitate future research and heritage management, a GIS-supported predictive model for sites in Bavaria and Baden-Wurttemberg based on pre-existing site data was conducted. The assessment of predictive location parameters for cave- and open-air-sites constitutes the basis of this predictive model. Therefore, the factors elevation, slope, aspect, distance to rivers and outgoing visibility were evaluated for their significance as prognostic variables for both site types in order to understand the possible interplay between them. Following this, two separate predictive maps for cave sites and open-air sites were generated in QGIS via Weighted Layer Analysis. The results show that especially along the Franconian-Swabian Jura and its outskirts, areas with simultaneously high potential for cave and open-air sites were plenty, offering optimal conditions for fast and efficient migration along the west-east-axis of the karst landscape. Herein lies one possible reason for the key role in facilitating Neanderthal migration that can be traced from Central Europe to the Siberian Altai.

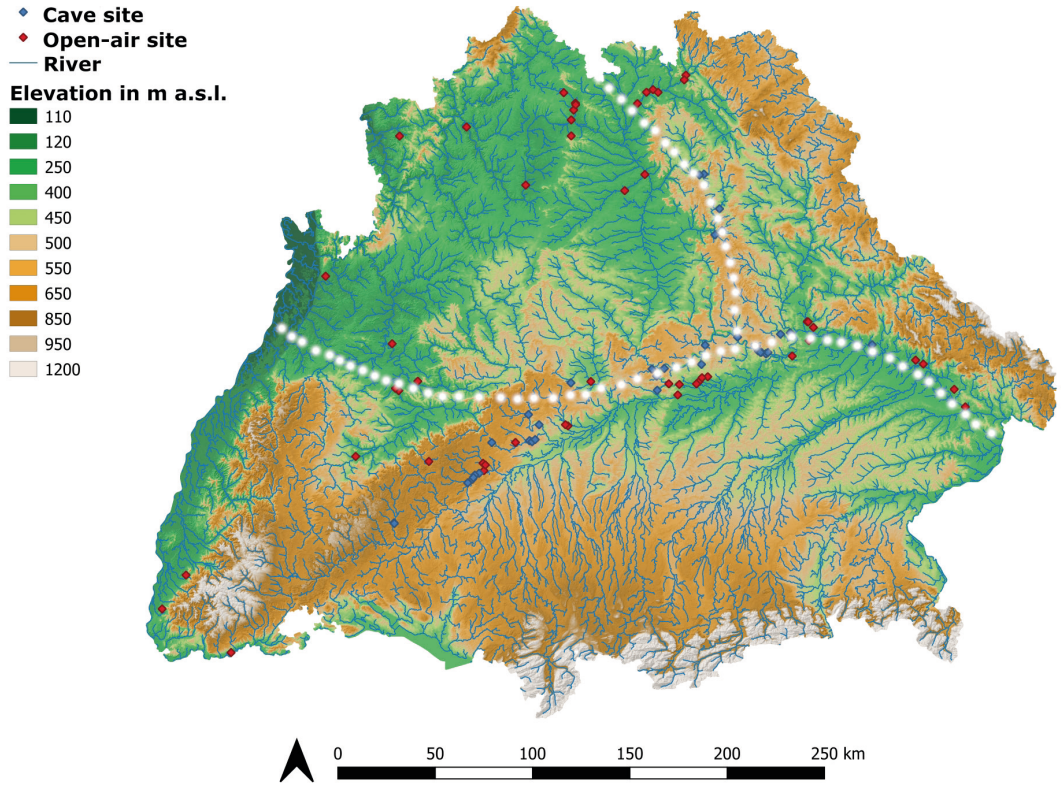

Fig.1: Possible migration axes along the Franconian and Swabian Jura during the Middle Palaeolithic (white dotted line). Coordinate reference system: EPSG 25832. Topographic data: Digital land model © EEA 2020; Site data © Bayerisches Landesamt für Denkmalpflege 2020, Landesamt für Denkmalpflege Baden-Württemberg 2020, Höhlenkataster Fränkische Alb 2020

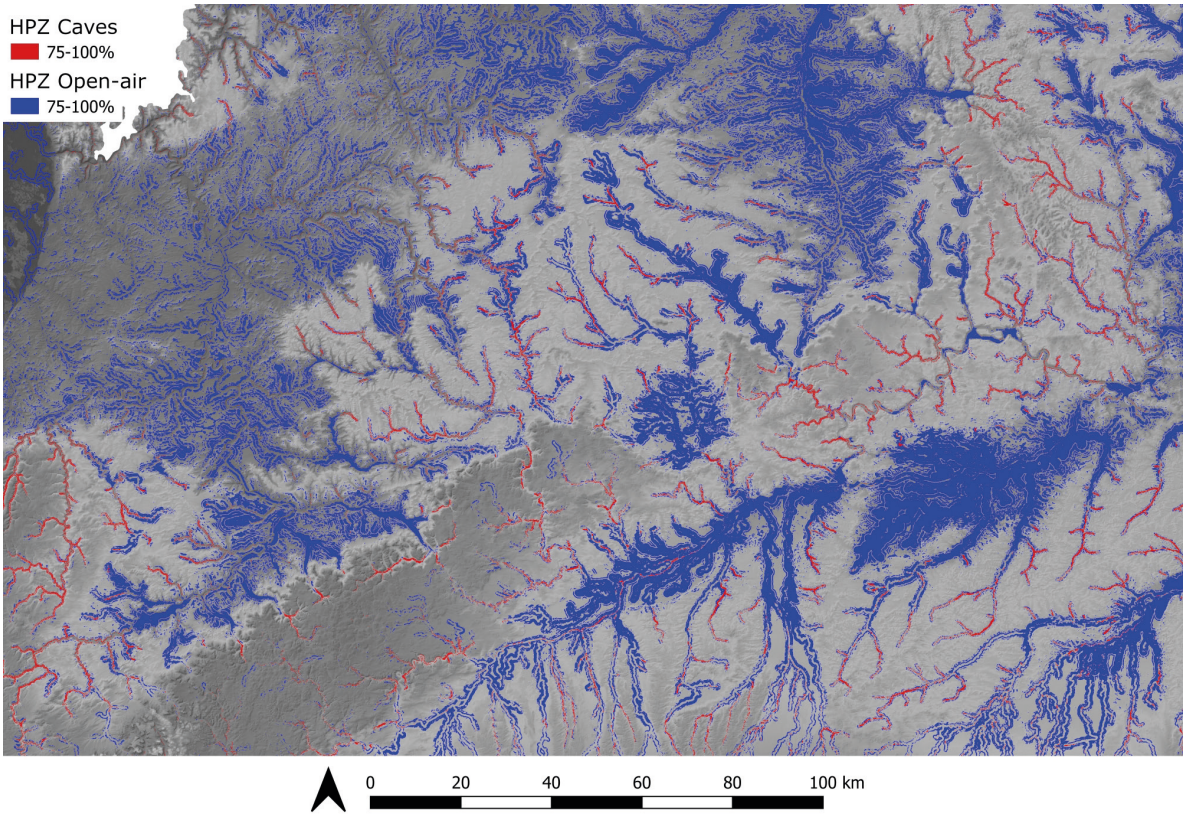

Fig.2: Distribution of High Probability Zones (HPZ) for cave and open-air sites along the Franconian and Swabian Jura. Coordinate reference system: EPSG 25832. Topographic data: Digital land model © EEA 2020.

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Markus Wild[1], Birgit Gehlen[2] & Martin Street[3]

Antler Headdresses. Implications from a many-faceted study of an earliest Mesolithic phenomenon

So-called antler headdresses, red deer crania with antlers specifically modified by humans are a phenomenon typical of early Mesolithic sites in the northern European lowlands. In addition to clearly processed pieces with artificial perforations, antlers split lengthways, and heavy processing of their surfaces, there are also pieces that have only one type of these modifications and others in which human processing is hardly verifiable. Although a comprehensive study of these so-called deer antler headdresses has so far not been carried out, the various artefacts are often discussed functionally depending on other findings from this group. We present here a synthetic study of corresponding objects from 10 sites and layers, among them finds from Star Carr, Friesack 4, and Bedburg-Königshoven.
Based on zooarchaeological assessment of the assemblages and possible headdresses, their technological description, and experimental work, we propose a polythetic headdress definition based on morphometric and technological features. Applying this definition allows for the identification of only a handful of artefacts from five sites that can well be distinguished from otherwise treated cranial deer bones (e.g. butchering waste (Wild 2014), so-called (bone or deer) ring-frontlets (David et al. 2016), or a wide range of other modified antler frontlets (Elliott et al. 2018)). As chronological data were lacking, we directly dated finds from Hohen Viecheln and Berlin-Biesdorf. Further direct and contextual dates for Bedburg-Königshoven and Star Carr allow for modelling the headdress chronology and identify them as a short-termed earliest Mesolithic phenomenon that can be correlated with the spread of Mesolithic lifeways into lowland Northern Europe after the Preboreal Oscillation 1 (PBO1).
Ultimately the new data offer potential for re-investigating the functional interpretation of this group of artefacts and help to better understand existing models on human-red deer interactions during the Early Mesolithic.

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The Magdalenian in the Lone Valley of southwest Germany, a local reconstruction with new faunal data from Langmahdhalde

The Swabian Jura of southwest Germany is well-known for its archaeological sites and contributions to Paleolithic research. The Lone Valley, in the northeast part of the Jura, is home to several Paleolithic sites, including Bockstein, Hohlenstein, and Vogelherd, but there are few Magdalenian remains from this specific valley. In 2016, the University of Tübingen began excavations at a new site in the Lone Valley called Langmahdhalde which uncovered well-stratified archaeological horizons with lithics, fauna, and combustion features that date

to the Magdalenian (dates range from 15,447 to 13,934 cal yr BP). Our study combines traditional zooarchaeological methods, stable isotope analysis, and taxonomic and taphonomic studies of the microfauna to reconstruct human subsistence and paleoecology at the scale of the Lone Valley. We then apply these results to discussions of human resettlement and use of the valley during this period. We find that, like much of the Magdalenian archaeological record of Central Europe, the remains from Langmahdhalde indicate that the people who used the site primarily hunted horse and reindeer and performed activities such as bone and antler working and marrow extraction at the site. Additionally, our results suggest that the local environment was open tundra that, compared to modern tundra regions, had warmer temperatures, more annual precipitation, and longer vegetative activity periods. We argue that this suggests the environment was more diverse than modern tundra regions and likely attractive to hunter-gatherers who resettled this region during the Late Glacial. Overall, the faunal remains from Langmahdhalde demonstrate the occupation of the Lone Valley and, potentially, the presence of medium-sized hunter-gatherer groups in the valley during the Magdalenian. Our future work with this assemblage will focus on refining our reconstructions of human settlement patterns.

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Excavations at Steenbokfontein South, West Coast, Western Cape, South Africa

The factors driving behavioural evolution in later Pleistocene African *Homo sapiens* are highly contested. Central to this debate is the well-documented southern African archaeological record, wherein early evidence for cultural complexity (i.e. modern human behaviour) varies both spatially and temporally. Here we present a new field project that aims to assess the timing and spatial variability of *Homo sapiens* adaptation in the lesser-known west coast region of southern Africa. We will focus on the later Pleistocene archaeological record, that is characterized by rapid shifts in human cultural behaviours, but that remains contentious in terms of the timing and geographic variability of these shifts. The source region for much of this controversy is the west coast of southern Africa, where some scientists argue for an older, more gradual evolution of cultural complexity than is evident in other regions of southern Africa. We will assess this mismatch between existing dates and cultural data through the excavation of a promising new west coast site - Steenbokfontein South - and its relationship to regional patterns of cultural behavior. The project will explore human behavioral evolution by generating new high-quality data through excavation, by mapping regional stone artefact manufacturing strategies and by exploring human landscape use and group social connectivity through documenting stone procurement and transport patterns.

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Darya Presnyakova

Variability in later Acheulean behaviour – a comparison of hominin landscape use at Elandsfontein and Cornelia

The production of Acheulean bifacial Large Cutting Tools (hereafter "LCTs") (bifaces and handaxes) remains the most characteristic and recognizable technology by which Acheulean industries are traditionally identified in the archaeological record. Hominins practised Acheulean LCT technologies for ~1.5 Ma, and many researchers interpreted the longevity of this technocomplex and the standardization of LCTs as socially mediated mental templates. The retention and communication of the mental template of complex technology would require the social transmission of knowledge and ideas, through teaching and imitation. Other researchers, however, find no support for complex social transmission in the Acheulean and suggest that enduring homogeneity and low levels of variability in the Acheulean could have been independently invented or re-invented by naïve individuals. These polarizing views on LCTs either as socially mediated technologies or as systems that were re-invented multiple times present implications for whether the Acheulean was a culture-traditional marker, and whether the emergence of the Acheulean could signify important changes in hominin cognition. A way to address this debate is by exploring whether distinct geographic and temporal manifestations of the Acheulean belonged to a single technological system. Here we compare the technologies at two classical South African Acheulean sites, Elandsfontein and Cornelia. Similarities in age (1 Ma – 600 Ka) and faunal composition potentially suggest that the two sites should exhibit a similar technological system where variation in size and shape of LCTs would fall on a single reduction trajectory. This project will explore this question with multivariate statistics and the powerful tools of geometric morphometrics.

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Excursions of the 62nd Obermaier Meeting

Excursion A

Kůlna Cave

Petr Neruda, Moravian Museum Brno

History

The first archaeological excavations at Kůlna Cave were carried out by J. Wankel in 1880 (Wankel 1882). Wankel concentrated on the central part of the cavern, since in his view this was where intact sediments were likely to be found. In the current system of zoning of the cave this would be Sector G2 (see Fig. 1B). M. Kříž followed suit until 1886 (e.g. Kříž 1889, 1903). During the course of his excavation works he had 18 pits cut, of which 11 were allegedly dug to the very bottom. The existence of seven hearths mentioned by M. Kříž is noteworthy from the point of view of spatial structures. In 1887, J. Knies commenced his excavations; he took into account the position of Kříž's test pits and focused on unexcavated areas. During his digs Knies localised another 10, perhaps 11 fireplaces (Knies 1910, 1913, 1914).

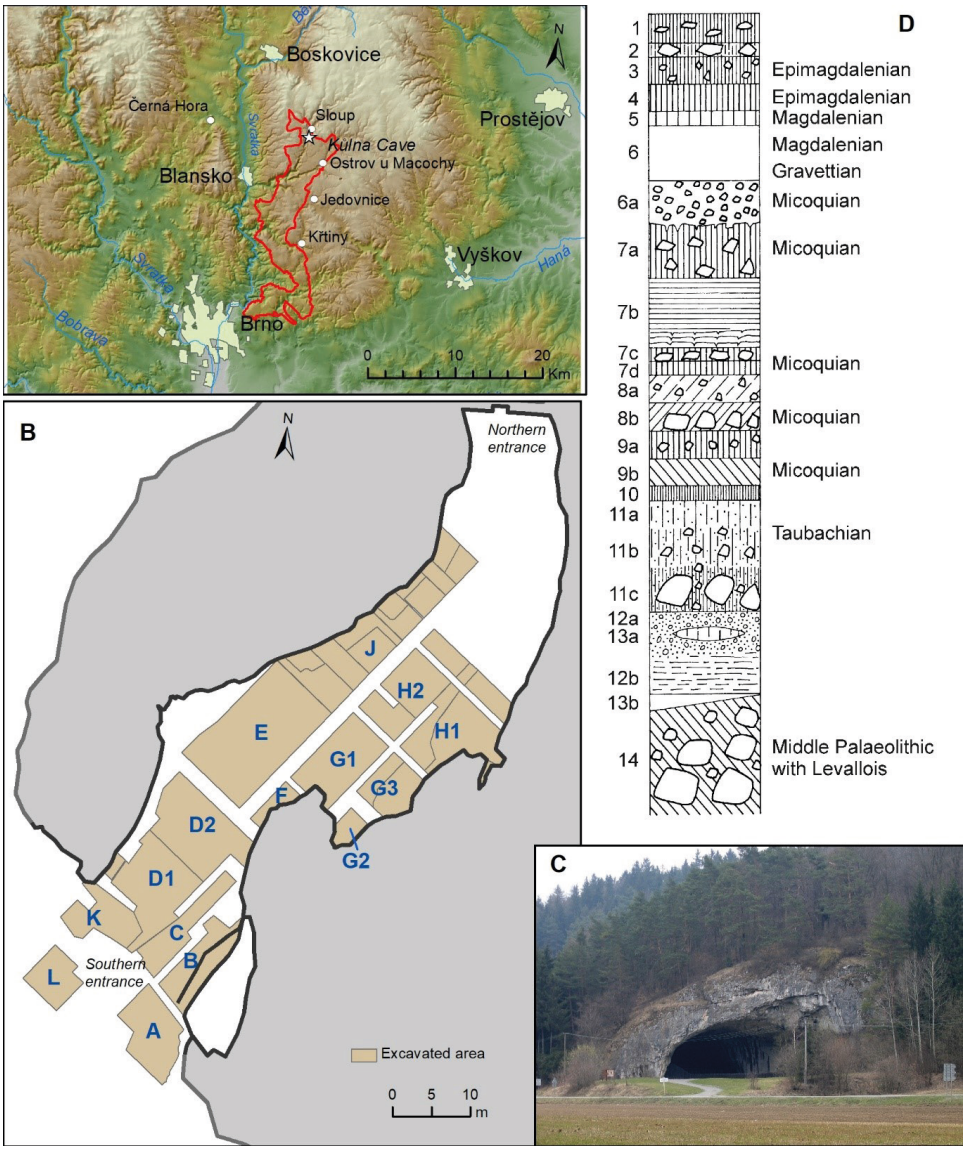

Fig. 1. Kůlna Cave. A - the geographical position of the cave, B – plan of the cave and the extent of Valoch's research, C – the southern entrance, and D – an ideal stratigraphical sequence in the cave.

No exploratory excavations were undertaken in the cave between the wars. Towards the end of WWII (1943–1945) the Germans built and operated an aircraft factory in the cave (Břečka, 2011). Fortunately, prior to the unavoidable adaptation of the cave, the workers of the Archaeological Institute of Prague were allowed to carry out test probing in the entrance area of the cave, and they ascertained Palaeolithic occupation in several layers. The significance of the discovery convinced A. Rust, a renowned researcher, to recommend as minimal an adaptation of the cave as possible. For this reason, the sediments that sloped down from the northern to the southern entrance were levelled in several steps of 80 cm difference in height. The more severe damage to the sediments occurred mainly in the rear and central part of the cave, whereas only the uppermost Holocene or Late Weichselian sediments suffered damage in the entrance part.
Concrete was removed as late as 1959, when K. Valoch started to prepare the cave for the systematic research programme that followed in 1961–1976 (Valoch, 1988a, Valoch, et al. 1969, 2011). The total explored area amounted to 900 m^2 (Fig. 1B). K. Valoch performed his most recent archaeological excavations in the cave in 1995 and 1997 (Valoch 2002) because of the archaeological exhibition being prepared in the cave. These excavations were carried out between sectors B and C (Squares 4-III/O).

Chronostratigraphy

In the course of his excavation, Valoch (1988b) differentiated a very complex stratigraphy – sector D comprised 14 geological layers with numerous sub-layers (Fig. 1C). The inner part of the cave contains only part of the stratigraphic sequence from Layers 8/7c to 5. The Middle Palaeolithic is recorded in the lower and middle part of the idealised sequence (Fig. 1D), from layer 14 (probably end of MIS 6) to layer 6a (MIS 3), the upper Palaeolithic one in Layers 6, 5, 4 and 3. Layers 2 and 1 contained artefacts from the Neolithic to Medieval Period.
Layer 14 represents the oldest phase of the settlement in Kůlna cave (Valoch 1970). The explored area in sector D2 was rather small (approximately 5 m^2), but the sediment nature and findings distribution throughout the layer suggest it is not an intact archaeological horizon and all findings are placed in the secondary position. Neither findings nor sediment are absolutely dated, but, based on interdisciplinary analyses, the cave use may be correlated to MIS 6 or at utmost to the beginning of the last interglacial (MIS 5e). Pollen analysis (Dolákova, 2002) describes fewer tree species and a higher presence of steppe elements in layer 14. With regard to the discovered data, K. Valoch characterizes the environment of layer 14 as a mild steppe ecosystem (2002), where elements of the cold Saale glacial are still present, but there can also be felt some warming. At this time, the Neanderthals used only the cave entrance to the rock step, which constituted a barrier and prevented inhabitation of the cave's inner space. It seems the Sloup Stream occasionally drained directly into the subterranean cave system. The economy of raw material use was mainly based on the processing of local materials (quartz, wacke, quartzite) and occasional use of raw material from farther away (spongolite). The chipped industry (Fig. 2: 1-5), which consists of both the subprismatic and the Levallois cores (Fig. 2: 1-3), is related to the Moustérian (Valoch, 1988a, Neruda, 2003).
The second complex (from the bottom) is represented mostly by a complex of Layers 11 related to the end of the Eemian interglacial (MIS 5e) and the beginning of the Weichsel Anaglacial. Absolute dating attempts have not been satisfactory (Patou-Mathis, et al. 2005; Michel, et al. 2006). This complex correlates in both technological and typological ways to the Taubachian (Valoch, 1984, 1988b). The characteristic feature is the opportunistic use of the raw material on a large scale, which was mainly processed by way of the core reduction strategy (Patou-Mathis, et al. 2000). We documented a significant variability of both discoid (Fig. 2: 6, 8) and subprismatic (Fig. 2: 7) methods. The industry is characteristic by the small dimensions of flakes and tools (Fig. 2: 9). The approach to hunting game was probably too opportunistic as we have evidence of species coming from both closed and open ecosystems. The spatial structure of the cave was quite simple (Fig. 3). Humans again inhabited just the entrance part to the rock step. Only two fireplaces, which are interconnected by a refitting (Neruda, 2017), have been proven. The use of osteological material during production is quite interesting (especially soft hammers). Generally, we can describe the economy of Taubachian hunters as opportunistic but with some progressive features, which we know from the later period of the Vistula Glacial (intentional import of the rock crystal from a long distance; Neruda ,2001).

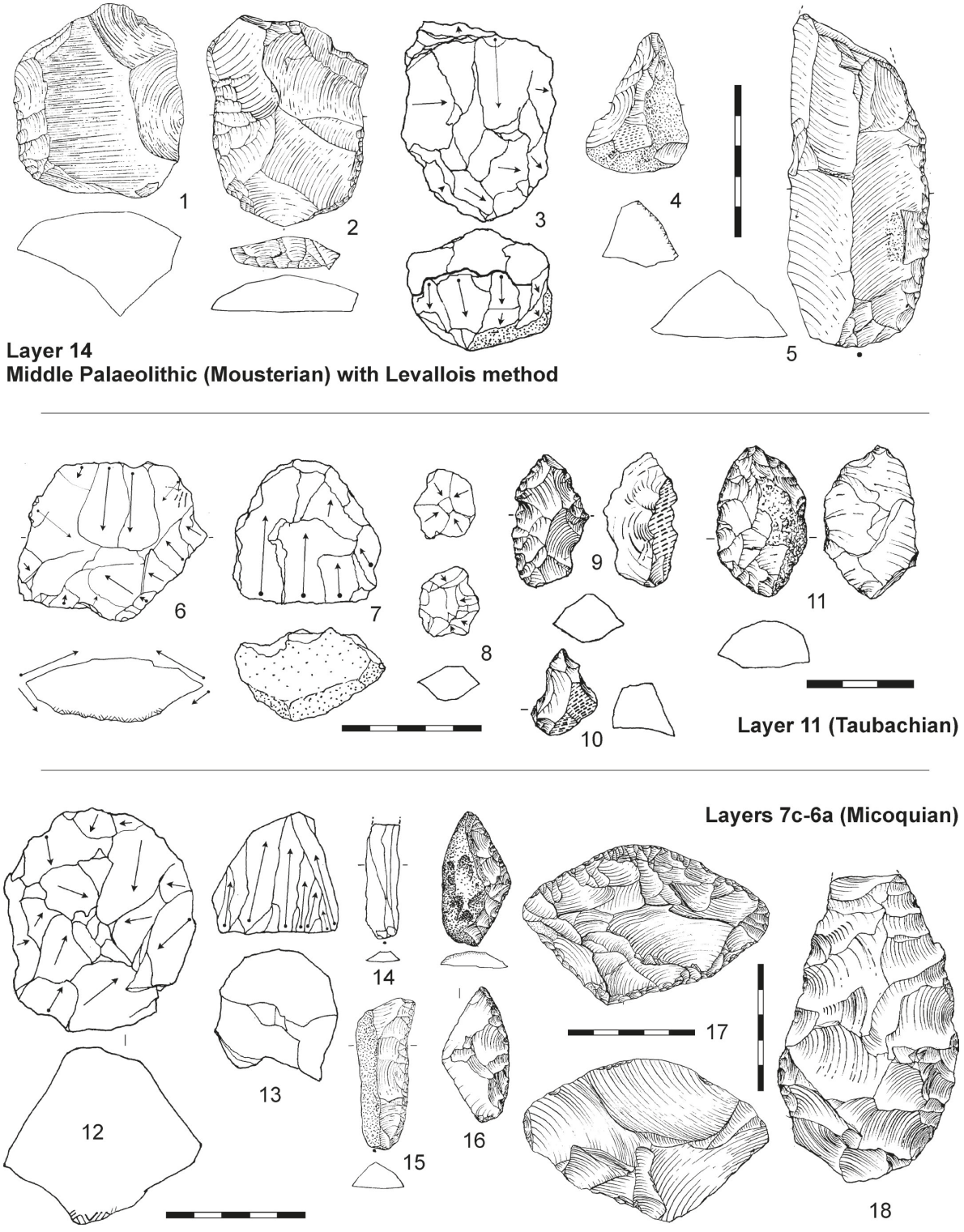

Fig.2: Middle Palaeolithic industries from Kůlna cave.

The next dominant settlement phase is related to the Micoquian, which is best documented in Layers 9b, 7c, 7a a 6a (Valoch, 1988a). Both 14C and ESR data for Layer 7a correlate relatively well around 50 ka BP (Mook 1988, Neruda, Nerudová, 2014, Rink et al., 1996). The raw material variability decreases in favour of spongolite, which rises, in some cases, to over 75 %. There can also be seen a certain level of technology standardization (only two types of the discoid (Fig. 2: 12) method as well as the prismatic (Fig. 2: 13, 14 and 15) method). The development of biface shaped tools (hand-axes, Fig. 2: 18), bifacial backed knives, leaf-shaped

points, bifacial side scrapers), which are supplemented by diverse types of combined side scrapers on flakes (Fig. 1: 16 and 17), is important for the next progression. Two retouchers from mammoth ivory are unique in the European context (Neruda, Lázničková-Galetová, 2018). From the economic point of view, we see evidence for standardization and logistic economic behaviour. We noted extraordinarily complex behaviour within spatial structures. In Layer 7a (Fig. 4) we distinguished several spots with a different function (a workshop, a butchery place, a main living area etc.). We may also consider, in some cases, structures could be related to non-utilitarian activity; for example, a cavity in the right wall of sector F, layer 7c, where three mammoth tusk were stored – artificially deposited there by humans (Neruda, 2017).

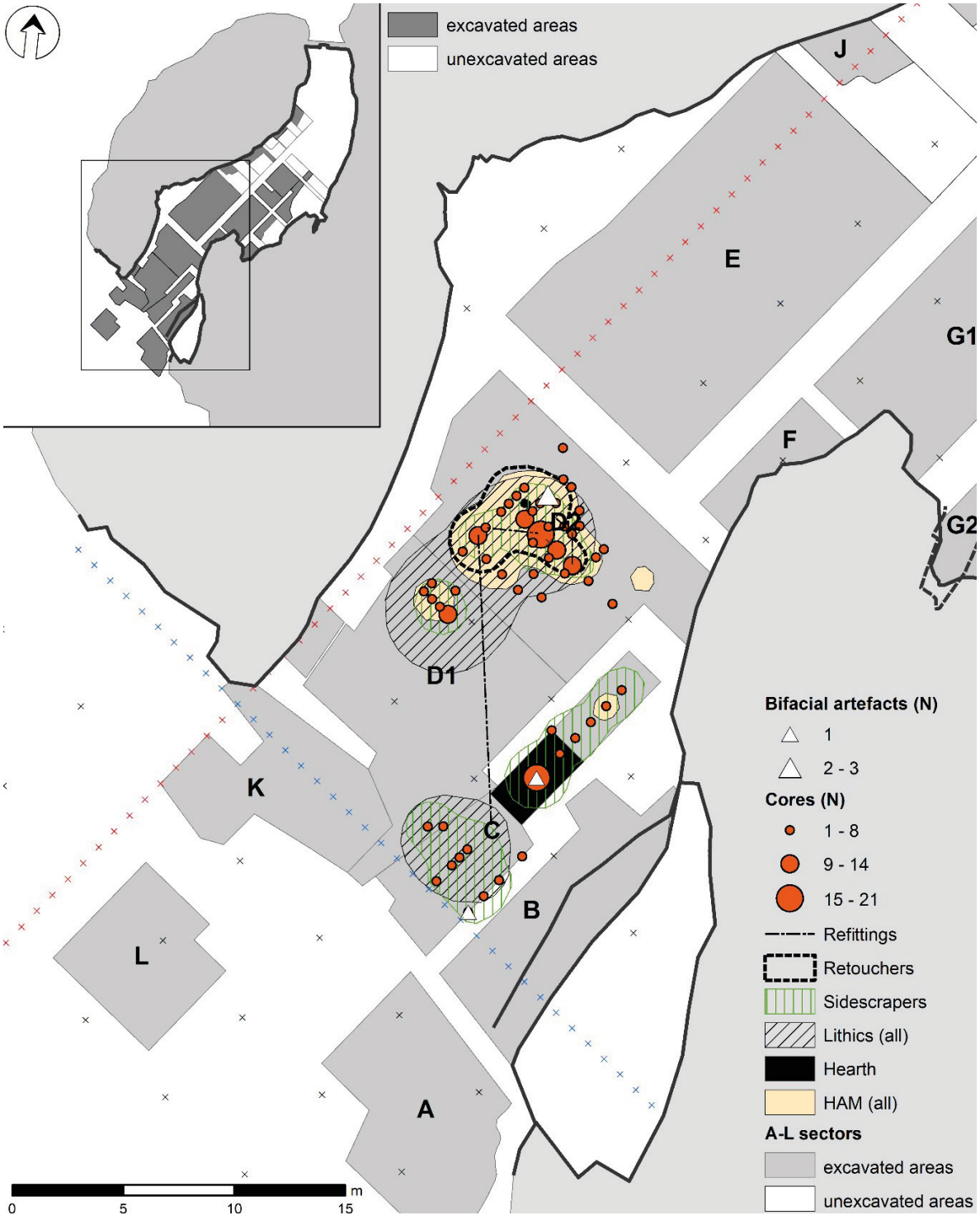

Fig.3: The spatial distribution of artefact groups in Taubachian Layer 11 (Neruda 2017).

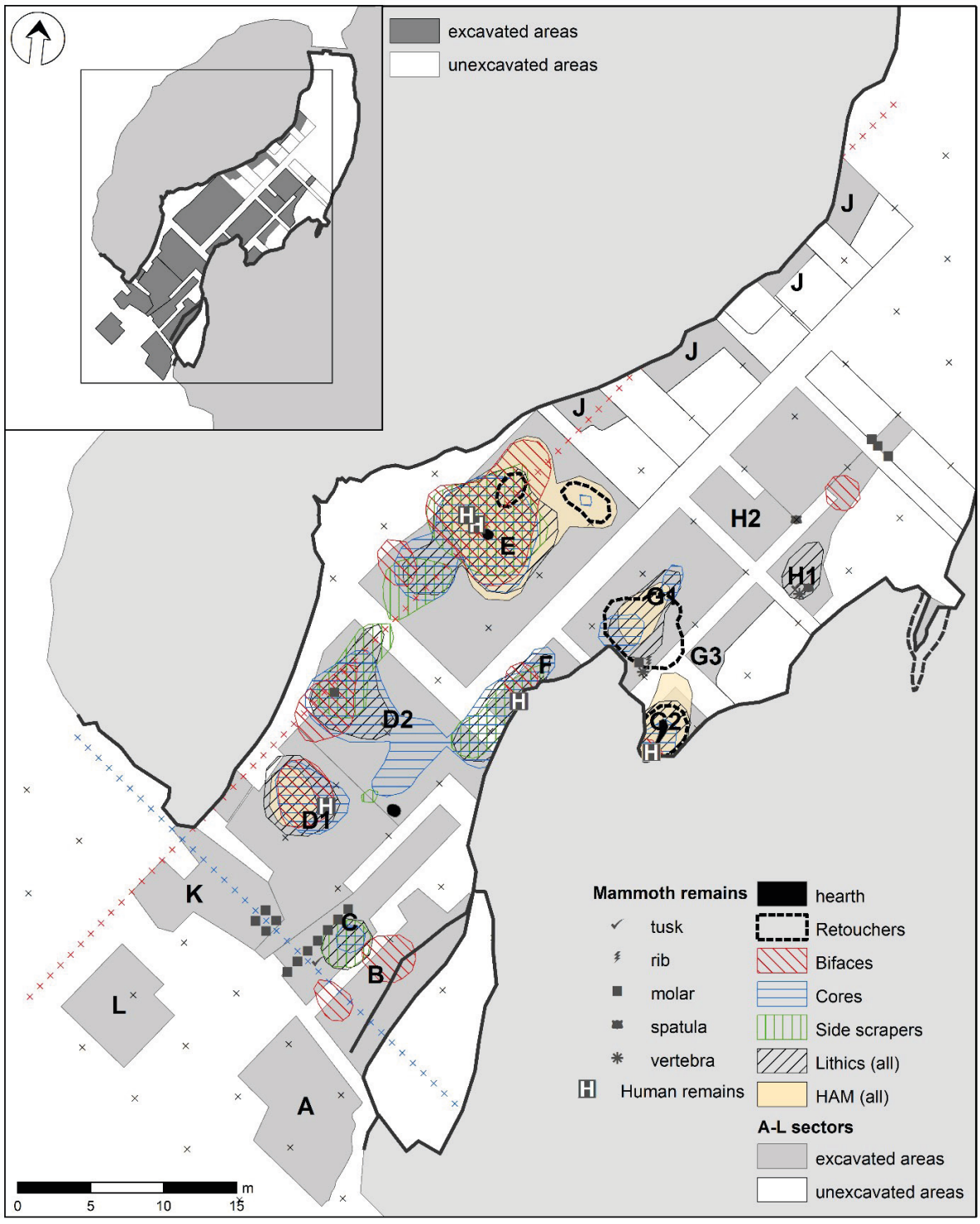

Fig.4: The spatial distribution of artefact groups in Micoquian Layer 7a (Neruda 2017).

Another issue of interest is the possible existence of an Early Upper Palaeolithic (EUP) industries in the cave. Geological layers corresponding to those captured in the nearby Pod Hradem Cave (Nejman et al., 2018, Valoch, 1965) were not identified by research into the filling of Kůlna Cave. In terms of stratigraphy, comparable sediments should be found between layers 6a and 6; in the large entrance part of the cave these only differed by the proportion of limestone clasts, otherwise the sediment was macroscopically uniform. It contained both Micoquian and Magdalenian artefacts and bones, from which we acquired the data capable of a correlation with the Gravettian (GrN-6853, GrN-6800, OxA-25269 and OxA-25299). No obvious proof of an erosion event was identified in the sediment; such an

event would explain the absence of Interpleniglacial soil, in which EUP industries occur in Moravia. Therefore, K. Valoch did not distinguish an individual layer that we could unambiguously link to the cultures of the EUP complex. Only four carinated-like endscrapers are documented in Layer 6a (Fig. 5). Although, we obtained one date from layer 6a, which falls within the EUP period (34,350 ± 600 ^{14}C BP; i.e. 39,420 ± 750 cal BP), the dated bone originates from the northern part of the excavated area (sector H3; cf. Fig. 1C), where even the Middle Palaeolithic sediments have been damaged, and there is no proof of anthropic impact on its surface (Neruda, Nerudová, 2014).

The fourth archaeological complex identified in the cave is the Gravettian occupation, which is rather sporadic in Moravian caves (Oliva, 2003). During the excavations, an independent Gravettian layer was not recognised in the cavern. Later on, its existence it was determined on the grounds of typological processing of the finds from sectors G and J and the radiocarbon data GrN-5773, GrN-5774, GrN-6800 and GrN-6853 (Mook 1988). However, the outcomes of a new dating of samples from sector J do not correspond to the established position, since they fit with the positions of the Epimagdalenian (OxA-25292 and OxA-25293) and the Magdalenian (cf. layer 6; OxA-25294 and OxA-25295).

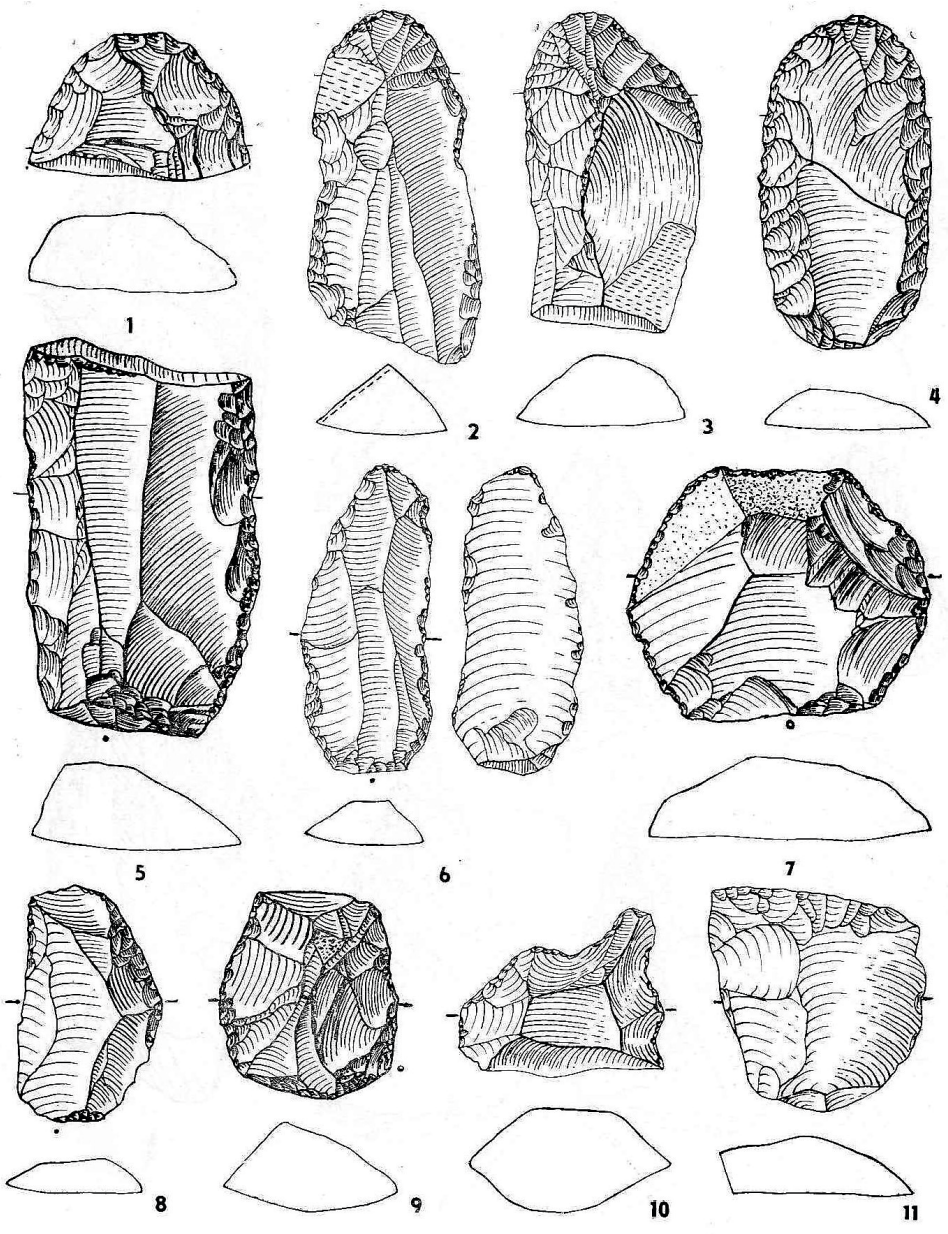

Fig.5: Carinated-like endscrapers from Micoquian Layer 6a (1–4) (Valoch et al. 1988, Abb. 17).

Endscrapers, retouched blades and blade points dominate (Valoch, 1988a, Oliva, 2002). Even a bone industry was found, while some pieces carry traces of ornamentation (Fig. 6), which correspond to the traditional patterns as we know them from the Pavlov settlement unit or from Předmostí by Přerov.
The cave entrance (sectors A-D) was probably also inhabited, but we were not able to capture an individual layer with a stone industry (Micoquian industry is present in the loess with limestone debris and Magdalénian findings in the same loess horizon with lower debris content). Only radiocarbon data indicate use of the entrance area by Gravettian hunters. Nevertheless, the obtained values (29,250 ± 260 and 29,830 ± 280 cal BP) are markedly older than the previous dates, which were within the range from 25,430 to 27,720 cal BP (Mook, 1988). Regrettably, at present we cannot decide whether it is necessary to shift the time of occupation of the Kůlna Cave to the middle phase of the Gravettian, or whether the new dating, in opposition to the older data, corroborates a second, older phase of Gravettian settlement within the cavern.

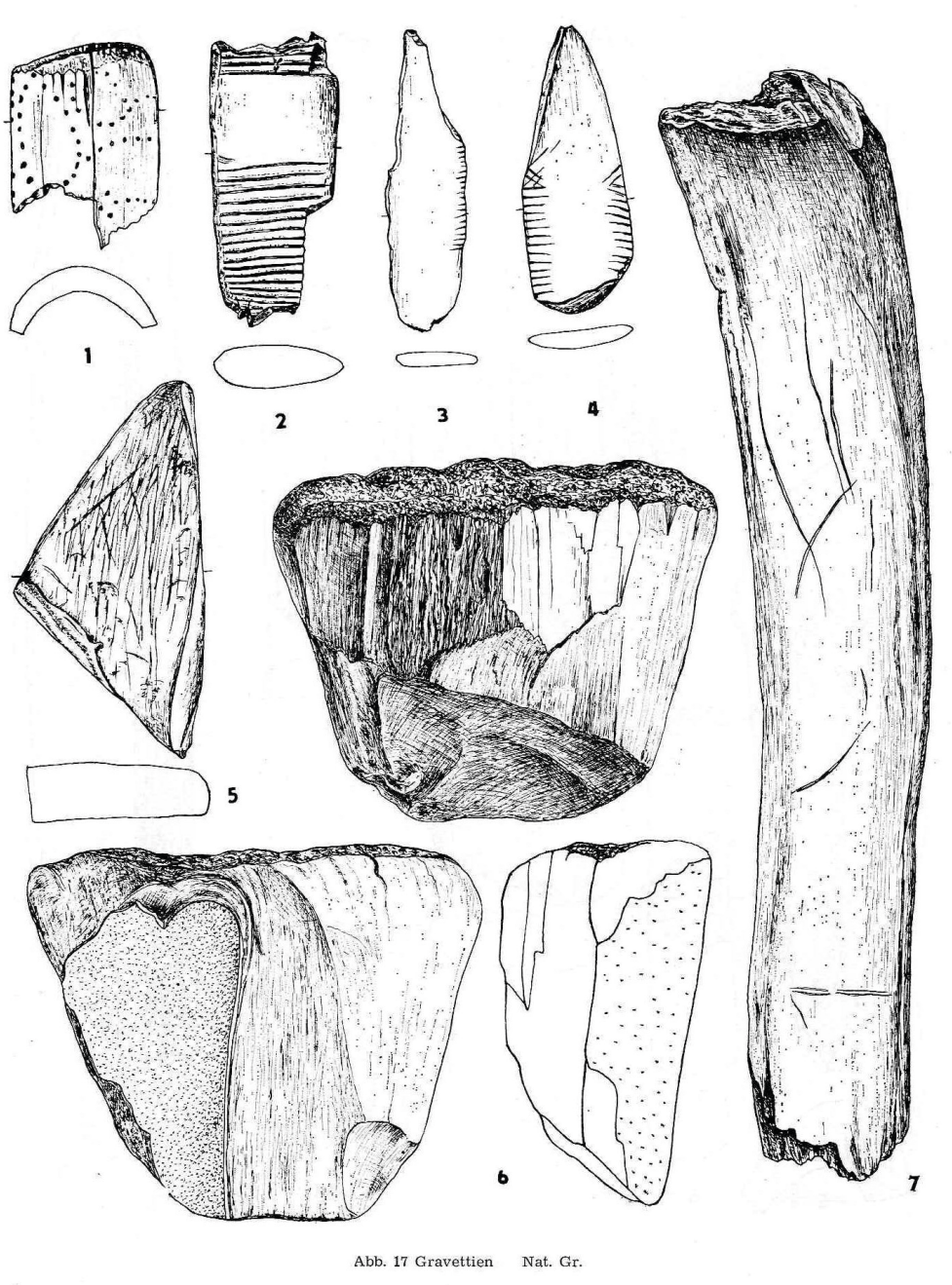

Fig.6: Pieces from hard animal materials related to the Gravettian (Valoch et al. 1988, Abb. 17).

The next cultural group is represented by the Magdalenian of Layers 6 and 5. Both layers were well preserved in the southern entrance of the cave. In the inner part of the cave the Magdalenian layer(s) was preserved only in sector G1 and H2 because the stratigraphic situation in other parts of the cave was destroyed during the construction of the cave factory. Preserved artefacts demonstrate a typical Magdalenian set (Fig. 7). As opposed to Pekárna Cave, artefacts from hard animal tissues are scarce. The most important problem is the chronological position of both Magdalenian horizons.
We acquired somewhat problematic results for layer 5. The difference between both of the new dates is 1600 years. The more recent date (12,900 cal BP) is close to layer 3 (cf. 12,940 cal BP; OxA-25283), the second matches with the Magdalenian of layer 6. From the stratigraphic point of view, in the case of the date 12,900 cal BP we have to consider an obvious contamination (mixing), although it is unclear, how this contamination between layers 3 and 5 could occur, since the position of the bone from which the sample has been taken was indubitable. Two explanations can be taken into consideration as regards the second date (OxA-25288): either the two horizons 5 and 6 are temporally so close to each other that the data overlaps, or the layers that yielded the finds were not very well differentiated. The previously acquired date (GrN-6103, bone; Mook, 1988) 17,480 ± 155 ^{14}C BP (20,830 ± 300 cal BP) most probably has nothing to do with the real chronological position of layer 5, because it is markedly older than the data from the underlying layer 6.
We can consider layer 6 to be the second chronostratigraphic marker of the Upper Palaeolithic sequence. A coherent set of data provided through new dating shifts the age of the Magdalenian of layer 6 from the Allerød to the period of LGT. In our opinion the date for layer 5, the data acquired from sector J (OxA-25294 and OxA-25295), and primarily sample OxA-25302 from a reindeer tibia dated at 14,810 ± 200 cal BP and originating from layer 6a also belong to this dataset (Neruda, Nerudová, 2014).

The last Palaeolithic cultural unit in the cave is related to the Epimagdalenian of Layers 4 and 3. The stone industry of this Epimagdalenian used smaller sized items (Fig. 8 and 9), but it kept typologically the Magdalenian spirit. The bone artefacts were rare (Fig. 9: 19 and 39); spear points are of similar shape as before. The environment changed significantly; cold weather adapted steppe fauna with reindeers disappeared and Holocene fauna with deer, moose, wild boar, and beaver dominated the region.

We noted a significant shift in the chronological interpretation of the Upper Palaeolithic sequence in the Kůlna Cave for layer 4; according to the original data layers 4 and 6 chronologically overlapped each other. Currently this is newly clearly delimited by dates in the interval 13,660-12,960 cal BP. From this, two samples (OxA-25284 and OxA-25285) come very close to each other and are generally 700 years older that the values for layer 3. Since layer 4 is clearly delimited in the main entrance part of the cave also geologically (Valoch, 2011a, 50), we can consider layer 4 to be a kind of first chronostratigraphic marker of the upper part of the cave filling.
With regard to the collections from layer 3, sample OxA-25282 falling within the Mesolithic period is problematic. Since the finds from layer 3 were discovered lying in dark Holocene soil that was difficult to differentiate from the overlying layer 2 (Neolithic; Valoch, 2011a, 50), the Holocene soil could also have contained more recent artefacts. This is corroborated indirectly by the radiocarbon date previously acquired from a piece of charcoal (GrN-6799), which corresponds to the Lower Neolithic (Mook 1988). In terms of stratigraphy, possible finds from the Mesolithic period would be part of the sediment of layer 3 as well. Although an independent Mesolithic layer was not differentiated during the excavations, in the processing of the material at a later date Valoch separated out stone artefacts the character of which corresponds to the Early Mesolithic (Fig. 9; Valoch, 2011b, fig. 1). The temporal position of the Mesolithic occupation of the cave could be determined to the date 7380 ± 40 cal BP. We can deem this reliable because of use-wears on the surface of a red deer antler. Two other pieces of data from isolated charcoals (OxA-25721 and OxA-25722) fall within the older phase of the Mesolithic (Preboreal) and they represent an evident contamination (Neruda, Nerudová, 2014). Sample OxA-25283 (12,940 ± 110 cal BP) would provide the best chronological delimitation of the Epimagdalenian from layer 3.

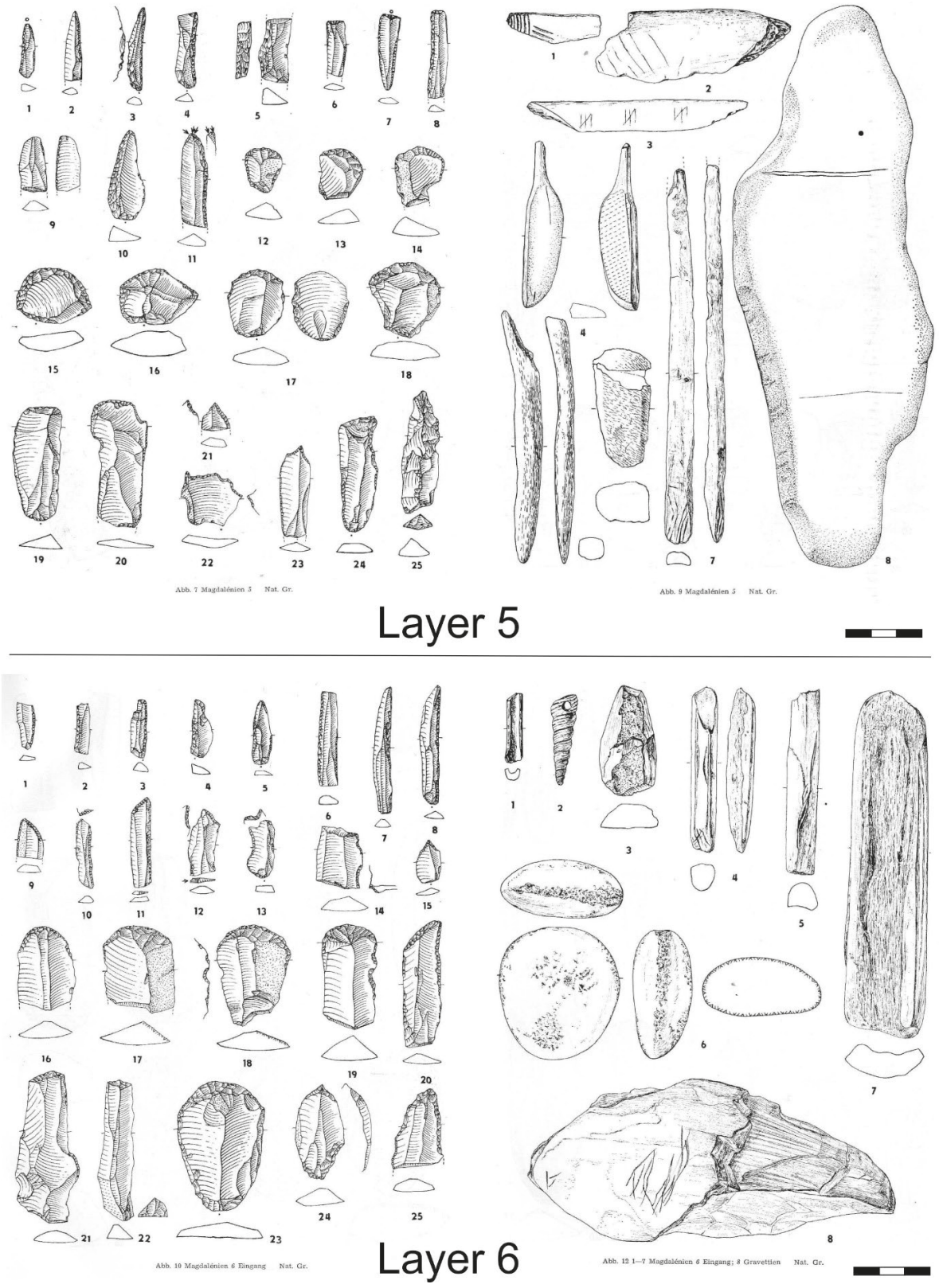

Fig.7 Magdalenian artefacts of Layer 6 and 5 (Valoch et al. 1988, Abb. 7, 9, 10, and 12).

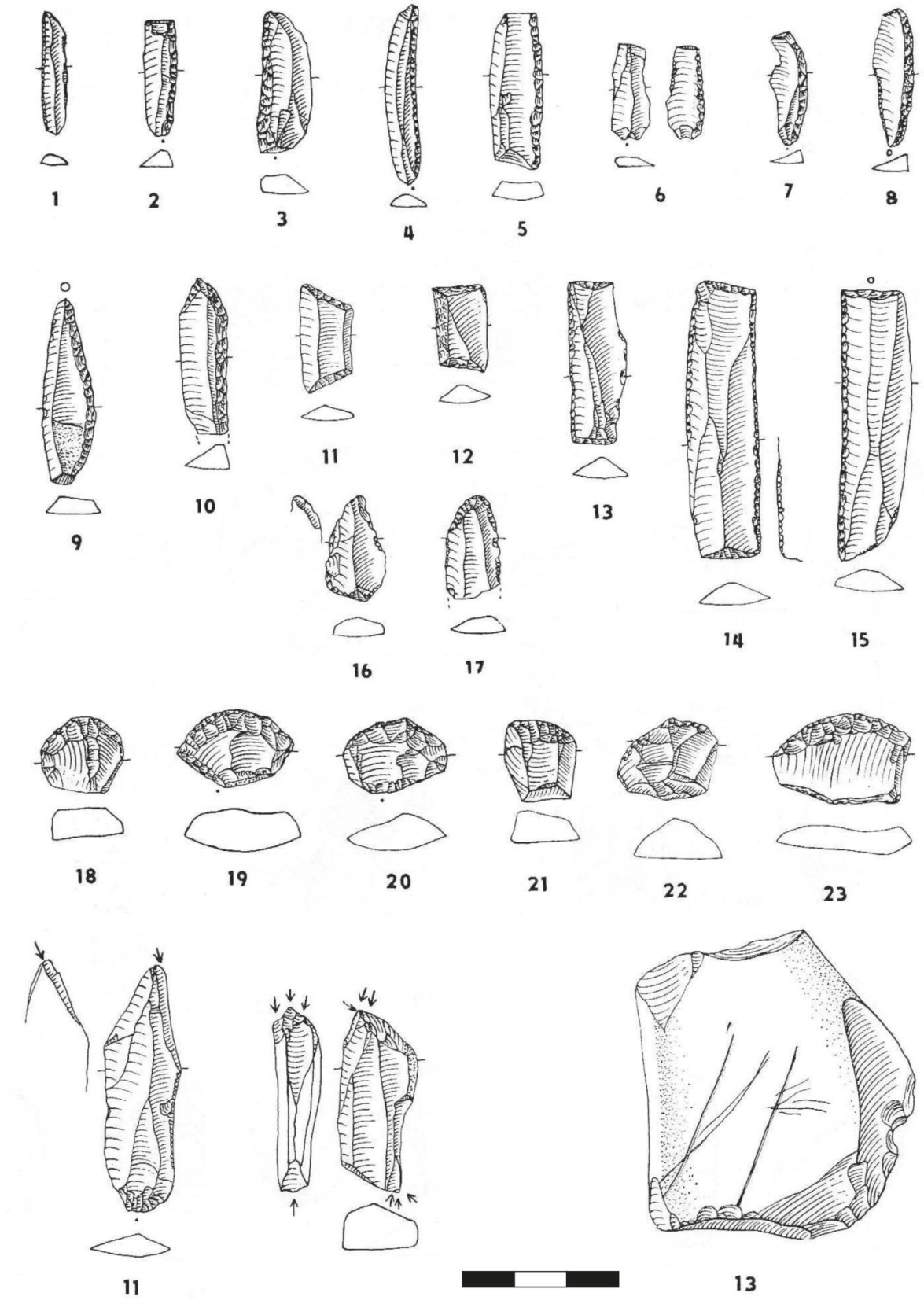

Fig.8: Epimagdalenian artefacts of Layer 4 (Valoch et al. 1988, Abb. 5 and 6).

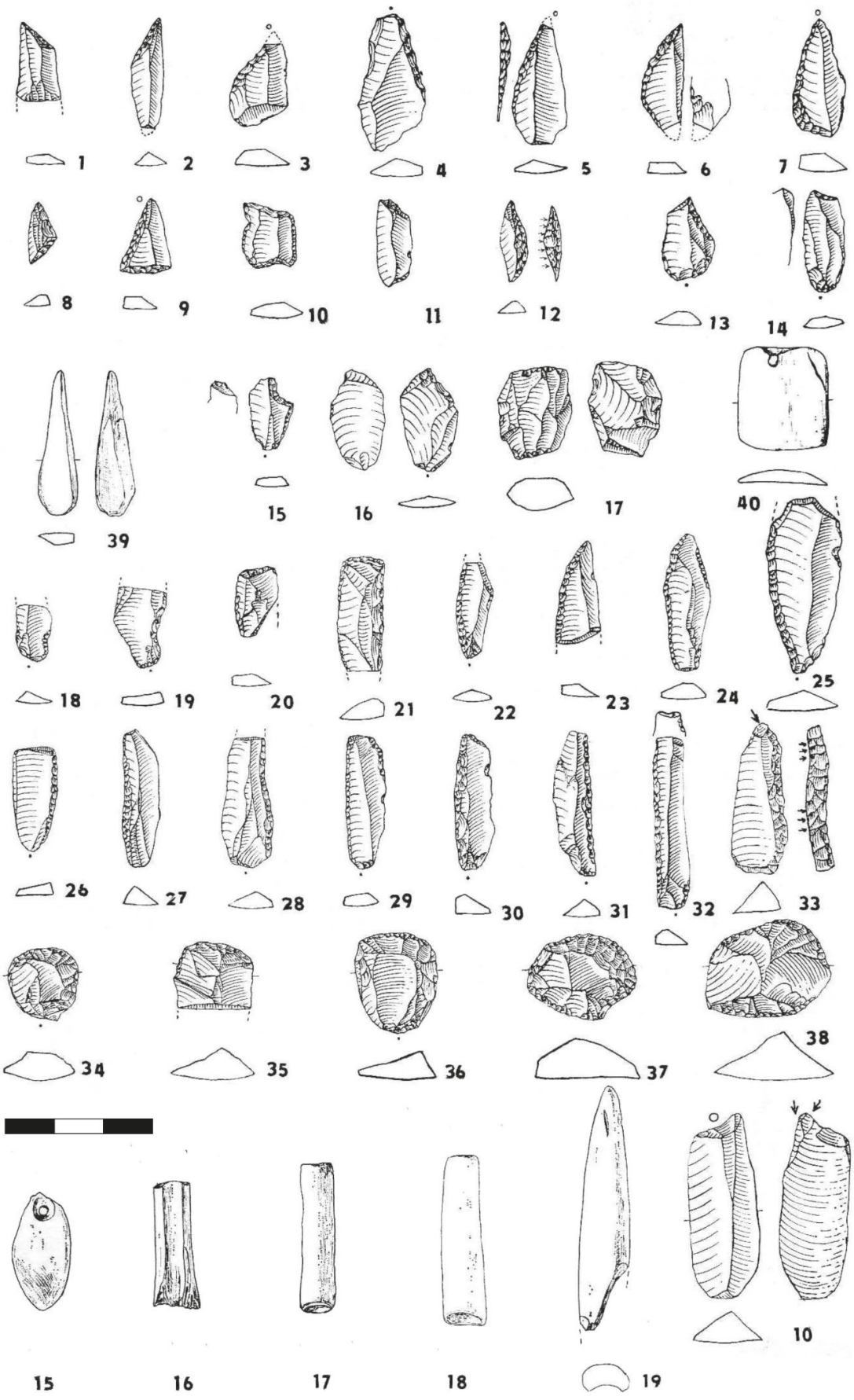

Fig.9: Epimagdalenian artefacts of Layer 3 (Valoch et al. 1988, Abb. 1 and 2).

Layers 2 and 1 contain finds from the Neolithic period to the Middle Age. Our knowledge about this time span occupation of the cave is based on finds from old excavation from the first half of the 20th century. During WWII Holocene sediments were removed from the major part of the cave and therefore, we could not study spatial distribution of artefacts and specify human activities in individual Holocene periods (Podborský, 2011).

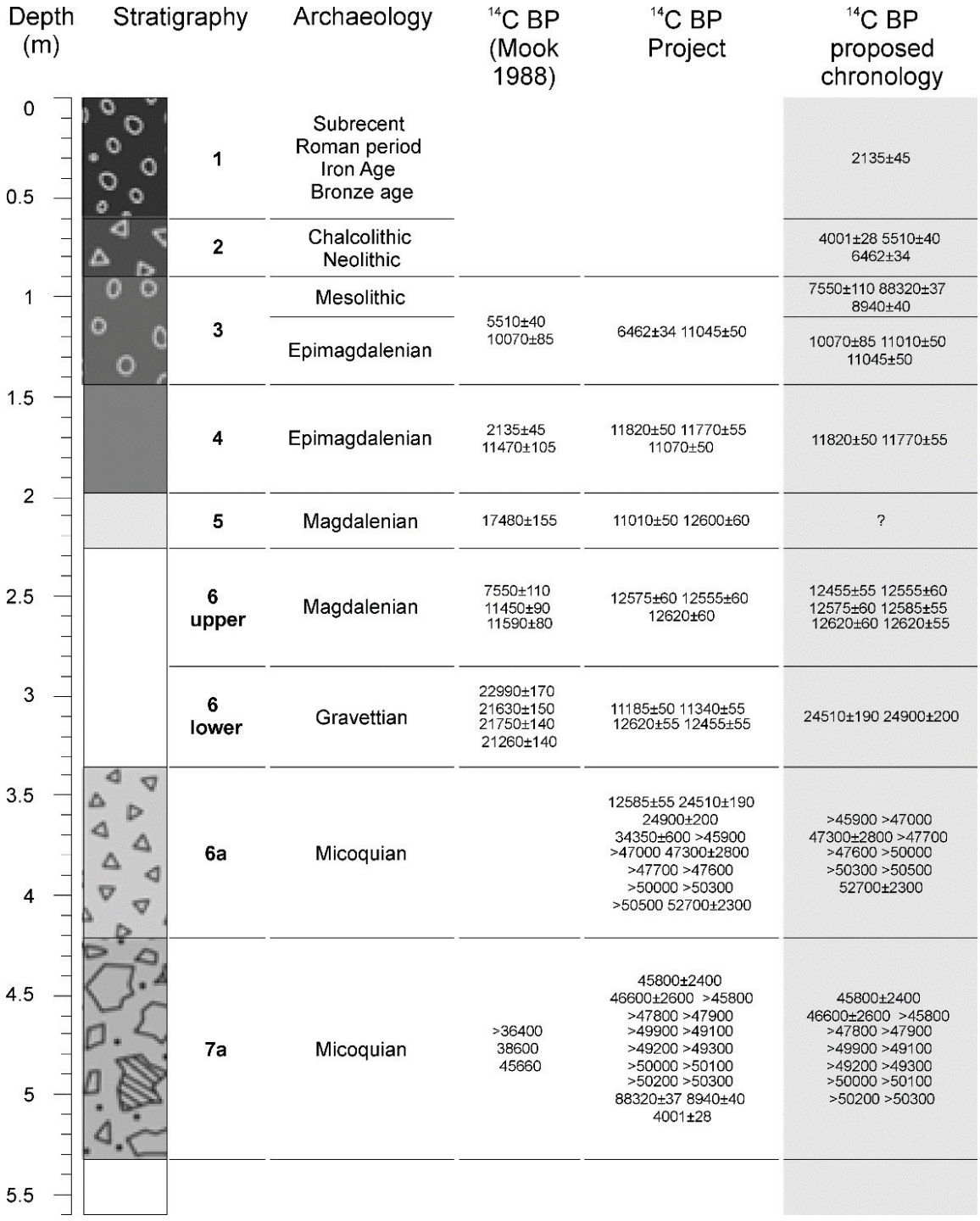

Fig.10: The chronostratigraphic model of Kůlna Cave.

Acknowledgements:
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Balcarka Cave, history of research

Zdeňka Nerudová, Moravian Museum Brno

Balcarka Cave is located roughly 32 kilometres northeast of Brno. The Cave is situated in the Suchý žleb (Dry Valley) near the market town Ostrov u Machochy (Ostrov near Macocha) in the Moravian Karst (Fig. 11, 12). Balcarka Cave was excavated at the end of the 19th and the beginning of the 20th centuries by Jan Knies and the inner cave system by Josef Šamalík (see Valoch, 2010 for a detailed overview). According to older publications, five, respectively six, hearths were uncovered as well as a small collection of knapped lithics (294 pcs preserved till today), bone and antler supports and their final products and decorated objects made from hard animal tissues (Rašková Zelinková, 2010, Pfeifer, 2017). This collection, according to 14C dating, is associated with the oldest Magdalenian occupation of Moravia (Valoch, 1960, 2001, 2010, Valoch, Neruda 2005, Neruda 2010, Maier 2015). Unfortunately, almost all the *in situ* sediments were removed from the cave during the original excavations, particularly those from the Magdalenian period (Nerudová, 2010), so nowadays, we can only study preserved artefacts. The cave was open to tourists soon after its excavation in the 1920's. This brought about significant morphological changes of its interior. Its aspect today is thus difficult to compare with excavation diaries and published reports.

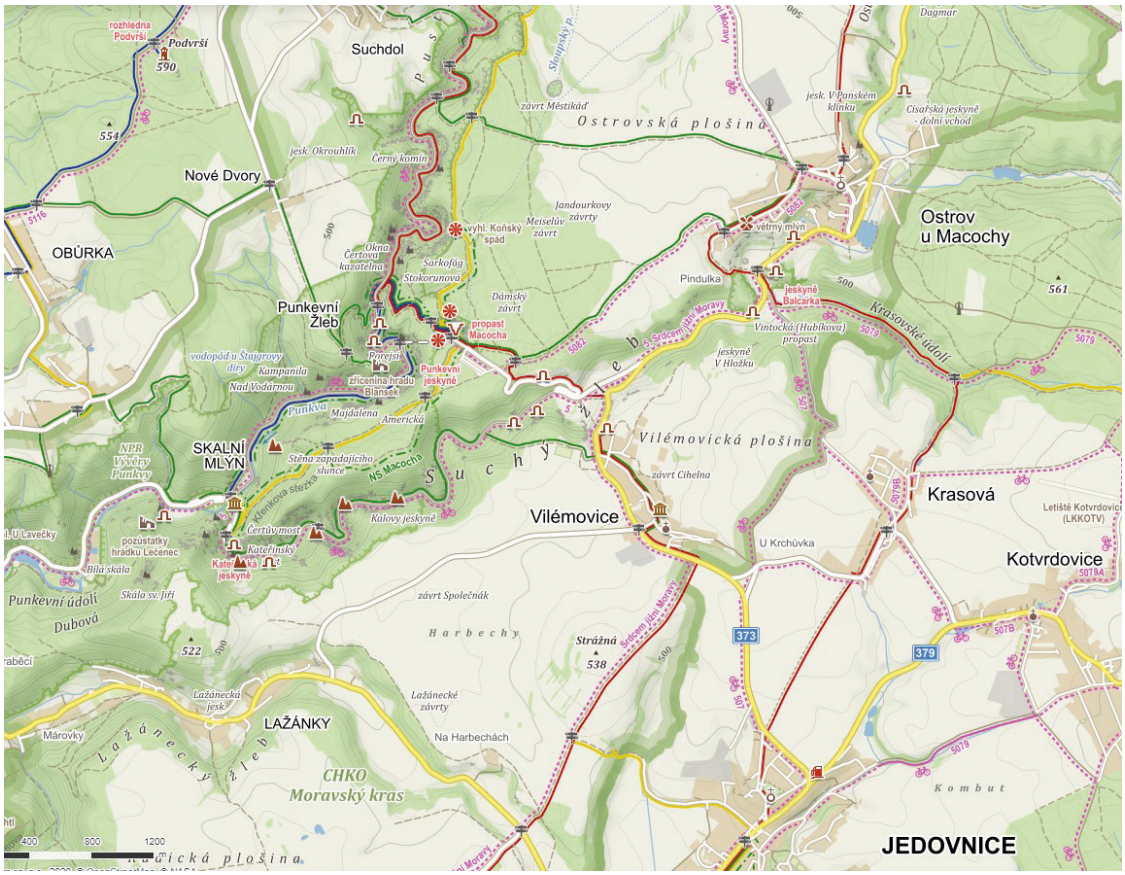

Fig.11: Map section of the Moravian Karst. Source: mapy.cz.

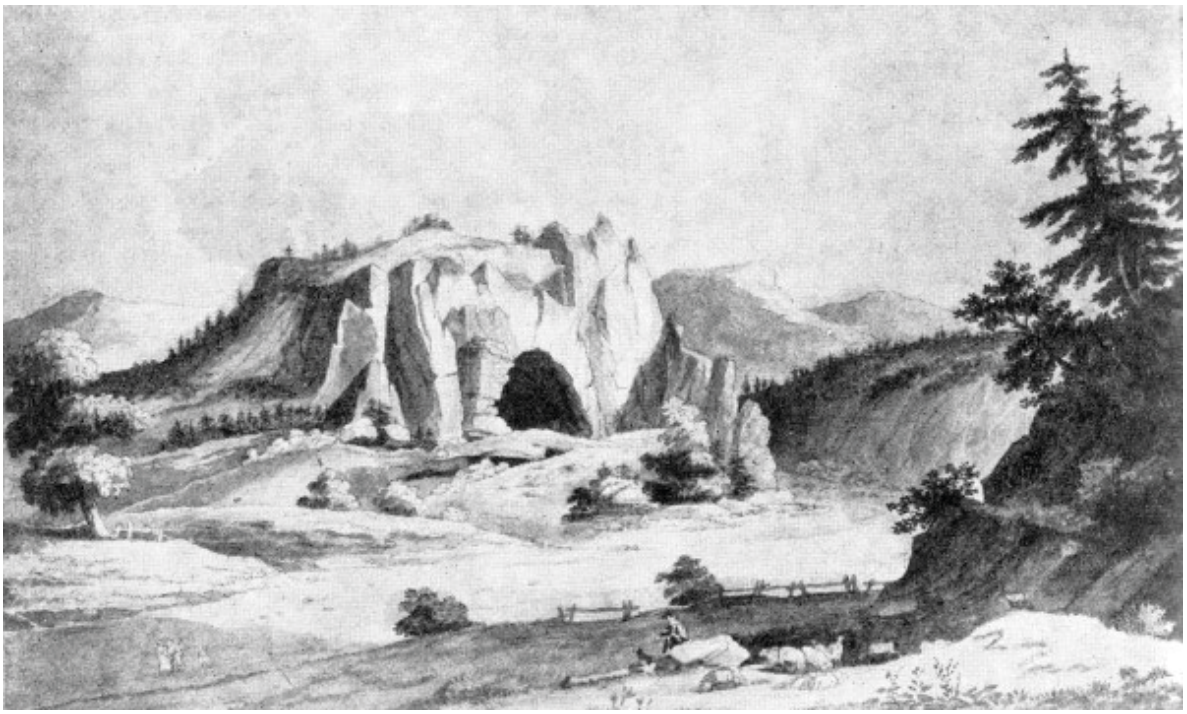

Fig.12: Romantic view - Balcarova skála Cave by F. Richter in 1820.

With regard to the lithics, these were encountered *in situ* in a single Magdalenian layer, together with osteological material *(Mammuthus primigenius, Ursus spalaeus, Rangifer tarandus, Vulpes sp., Canis lupus, Rupicapra rupicapra or Lepus timidus)*, numerous microfauna, three fragments of human bones (today lost) and bone and antler industry. The layer with archaeological and palaeontological finds and blocks of limestone also comprised of extensive - sometime discontinuous – black spots of charcoal and ash about 8-14 cm thick (Valoch, 2010). The precise position and character of these spots, originally interpreted as fireplaces, is impossible to reconstruct today. The most relevant published information (Valoch, 2010) is that in the immediate vicinity of these presumed fireplaces / hearths or directly in the ash lithics, animal bones and bone and antler objects were encountered (Fig. 13). Some objects from among the bone and antler industry have their surface macroscopically (i.e. probably) altered by fire (above all, colour change is evident here).

In 1937 Josef Šamalík investigated the next part of the Balcarka Cave - a little cavity called "muzeum" - situated in the western part of the Balcarka Cave system (Fig. 14). According to the investigator, evidence of human presence was found in a context abundant in Pleistocene fauna (Šamalík, 1937a, b). At the turn of 2001/2002 staff of the Anthropos Institute of the Moravian Museum in Brno carried out rescue archaeological research and a re-excavation within the frame of the planned reconstruction of this part of cave. During the excavation, only osteological remains of Pleistocene fauna were found (Neruda, Nerudová 2010). Unfortunately, we cannot confirm any evidence of human presence in this part of Balcarka Cave.

In 2007, within the framework of new reconstruction of the current entrance and inner parts of Balcarka Cave, we started the modern rescue archaeological excavation. Our research was focused on the entrance (the so-called upper entrance, previously excavated by Jan Knies). We discovered that the original sedimentological record had been disturbed by Šamalík's work at the beginning of the 20th century. We could document only rests of Pleistocene sediments abundant in animal bones (mostly cave bears). In the relocated sediments, we found only a few new lithic artefacts (not *in situ*), which can be associated with the Magdalanian or with older occupation of the cave. The older occupation is indicated by a radiocarbon date 32 520–33 040 cal. BP (OxA-18495; 28 360 ±140 ^{14}C BP) obtained from charcoals found together with a reindeer mandible probably in the rear part of the entrance (Nerudová, Neruda, 2010). The result of dating can be correlated to the Gravettian, which is unknown from the cave. Unfortunately, we cannot associate this radiocarbon date with an archaeological layer or archaeological finds because the original situation has been destroyed.

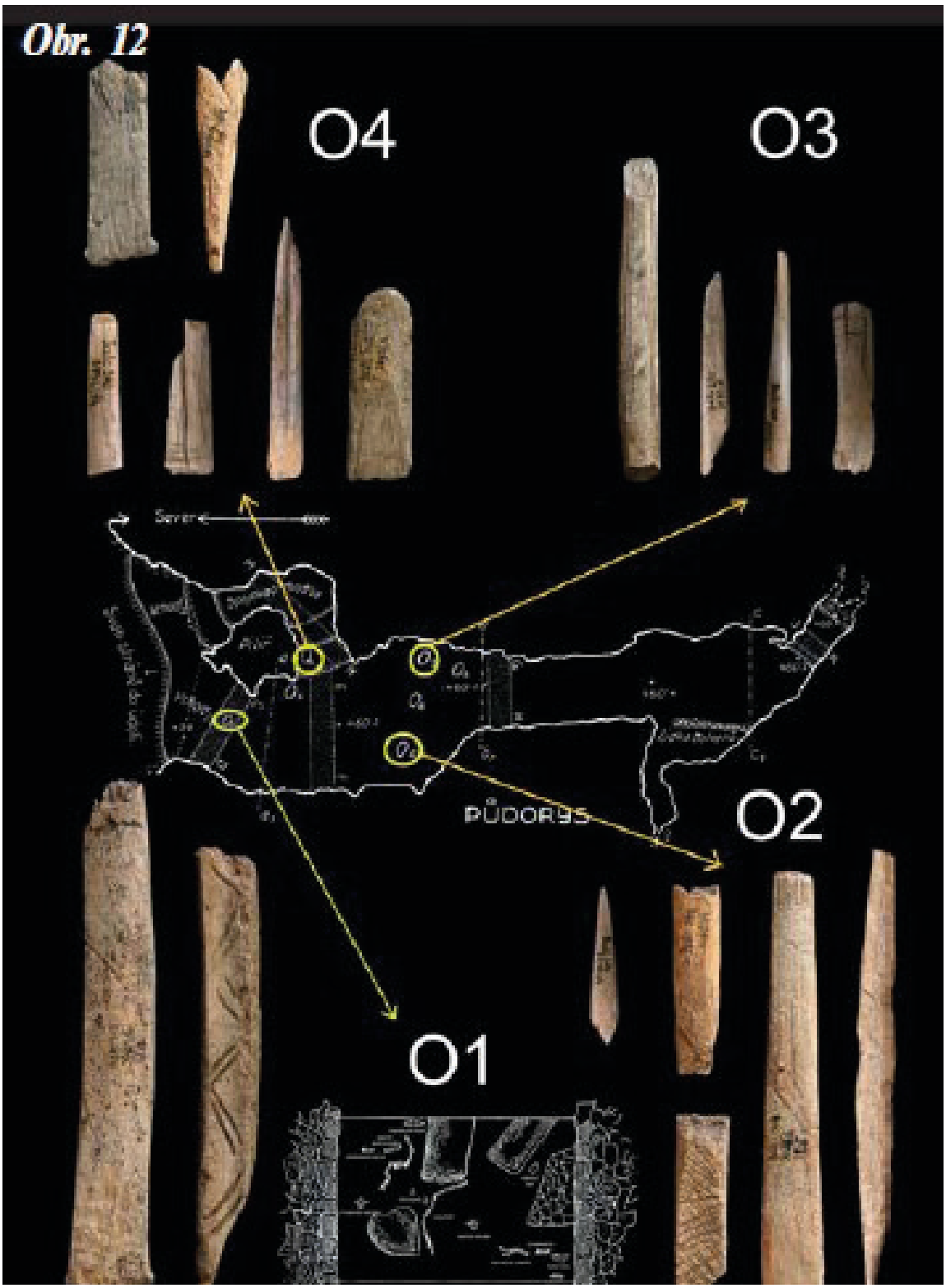

Fig.13: Spatial reconstruction some findings regarding fireplaces (O1-O4). As per M. Rašková Zelinková (2010, Obr. 12).

The total number of lithics totals 314 pieces. These are made from different raw materials. A white patina covers most of them. 247 (plus three unpatinated pcs) are made of erratic flints. Among other materials in Balcarka Cave, of note are Slovakian and Austrian radiolarites, a Hungarian radiolarite of the Szentgál type, spongolites from western Moravia, Olomučany type cherts. Rare finds include cherts of the Krumlovský les type, quartz, quartzite, rock crystal, limestone, porcellanite and a chert from the Cracowian Jurassic.

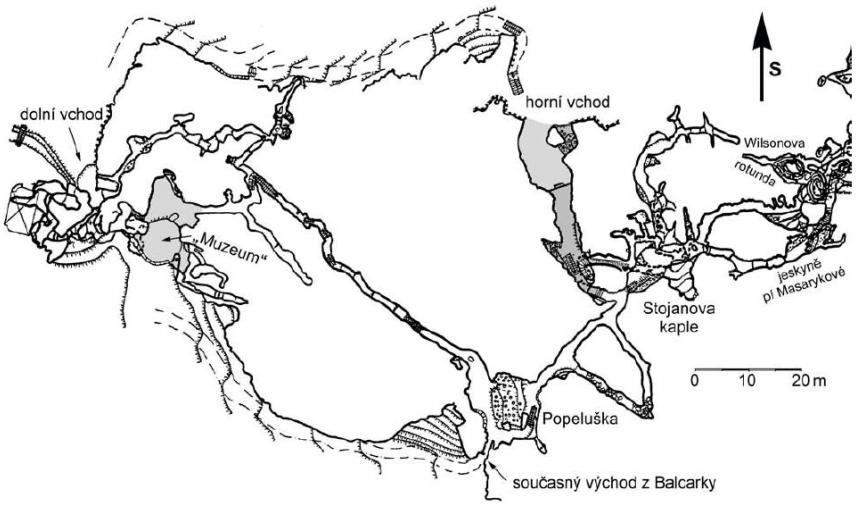

Fig.14: Plan of the Balcarca Cave. Dolní vchod – lower entrance, horní vchod – upper (current) entrance, současný východ z Balcarky – current exit as per Absolon (1906), Digitalisation P. Neruda.

In the chipped stone industry, backed bladelets (Fig. 15: 5-23) significantly prevail over end-scrapers, borers (Fig. 15: 27-31), notches and denticulates (Fig. 15: 1-4). Two segments (crescents; Fig. 15: 24, 25) and some short end-scrapers possibly indicate Late Palaeolithic occupation of the cave. Nevertheless, the main occupation of the cave is associate with the Magdalenian.

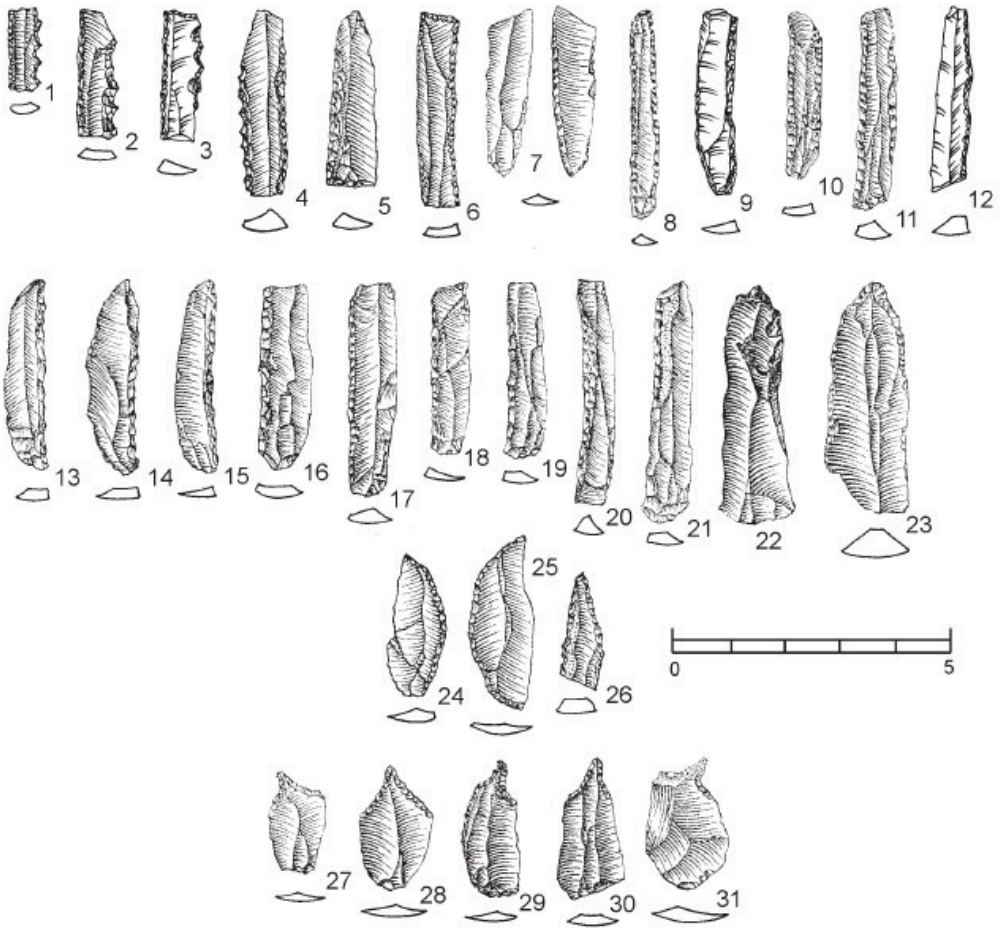

Fig.15: The lithic pieces from Balcarka Cave as per Valoch (1960) and Nerudová, Neruda (2010).

Fig.16: The view on the limestone block with the current (upper) entrance to the Balcarka cave. Photo P. Neruda.

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A phenomenon of the episodic Magdalenian settlement of the caves in the Suchý žleb Valley

Ondřej Mlejnek, Brno

The Moravian Karst is a region with numerous sites of Magdalenian settlement. Next to the main central settlements, such as the Pekárna, Kůlna or Býčí skála caves, there are many caves showing the sporadic presence of prehistoric foragers, archaeologically documented by isolated pieces of lithic artefacts or by cut animal bones and reindeer antlers. In this part we will focus on episodic settlement sites in the Suchý žleb valley located between Skalní mlýn (Rock Mill) and Vilémovice village in the northern part of the Moravian Karst. This is mainly the case of the Verunčina, Srnčí, Rytířská, and Koňská jáma caves. However, scarce evidence of the Upper Palaeolithic settlement has been documented also in other caves in this valley, such as the Smrtní, Kravská díra, and Kateřinská (see attached map – Fig. 17).

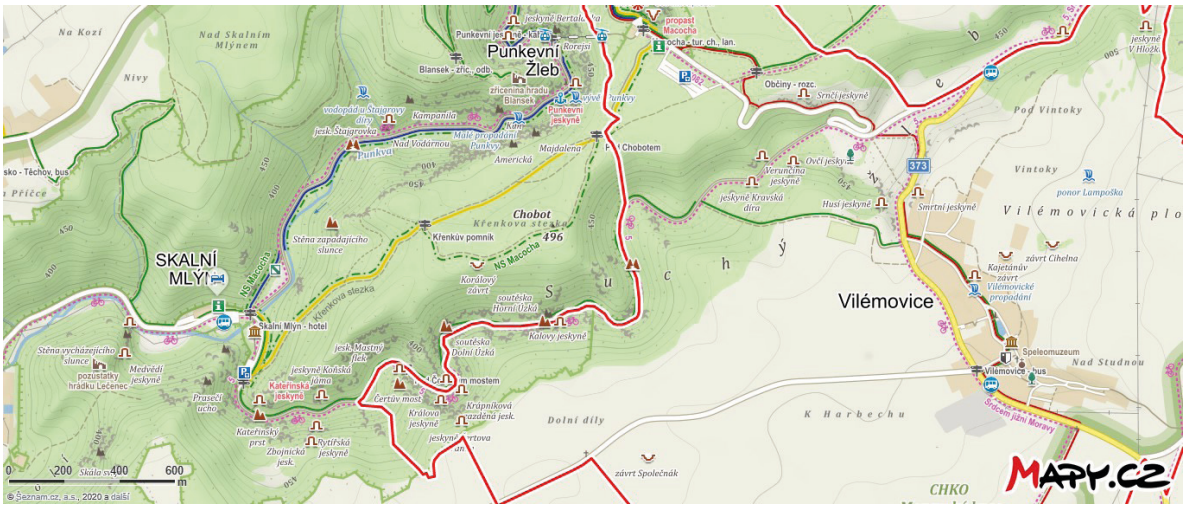

Fig.17: A map of the Suchý žleb (Dry Deep).

Verunčina jeskyně (Veronica´s Cave)

This site is located in the central part of the Suchý žleb valley in the cadastral territory of the Vilémovice village, at an altitude of 422 metres, circa 7 metres above the bottom of the valley. This cave was already well known to J. Wankel, who left his signature at the cave wall. Only animal bones were found here during the first excavation in 1906. The first evidence of Palaeolithic settlement was obtained by M. Zapletal, an amateur archaeologist from Vilémovice, who, together with J. Kučera, excavated this cave and later, in 1912, also with J. Knies. Their trenches were situated in the central part of the cave around a huge boulder which had fallen down from the cave ceiling, and later also in the rear and entrance parts of the cave. A thin Magdalenian cultural layer was situated in the upper part of the loess sediment under the Holocene soil. It contained charcoal, animal bones and five pieces of lithics including an end-scraper and three borers. In 1960, another excavation was conducted in this cave by J. Skutil within the framework of a project organized by the Archaeological Institute in Brno. A cave stratigraphy was geologically analysed and described by J. Pelíšek. Under the Holocene soil there was a loess sediment containing Magdalenian artefacts (Fig. 18), which fluently turned into a debris horizon, underneath which there was another loess layer. Excavated lithic assemblage consisted of circa 160 artefacts, specifically flakes, blades, bladelets, microblades, fragments, three cores, eighteen locally retouched artefacts, and one burin spall. A collection of twenty-two tools consisted of four end-scrapers, three burins, two borers, five backed bladelets, four bladelets with ventral retouch, and four retouched bladelets. Four locally retouched pointed blades had an impact in a distal part; therefore, they probably served as projectiles. Based on the field documentation, it was possible to prepare a plan of the artefact distribution and also to refit five broken lithics. Bone and antler artefacts were represented by cut reindeer antler, a basal fragment of the Magdalenian antler point, and a fragment of a pierced needle. The assemblage of finds is completed by

two shells of Tertiary molluscs (genus *Dentalium)*. Younger finds are represented by a prehistoric, probably Neolithic, pottery shard and a bead. Findings of Medieval pottery, including a fragment of the Loštice-type cup (15th Century) come from a trench located next to a rock wall in front of the cave. To conclude, Veronica´s Cave can be characterized as a site with episodic Magdalenian settlement.

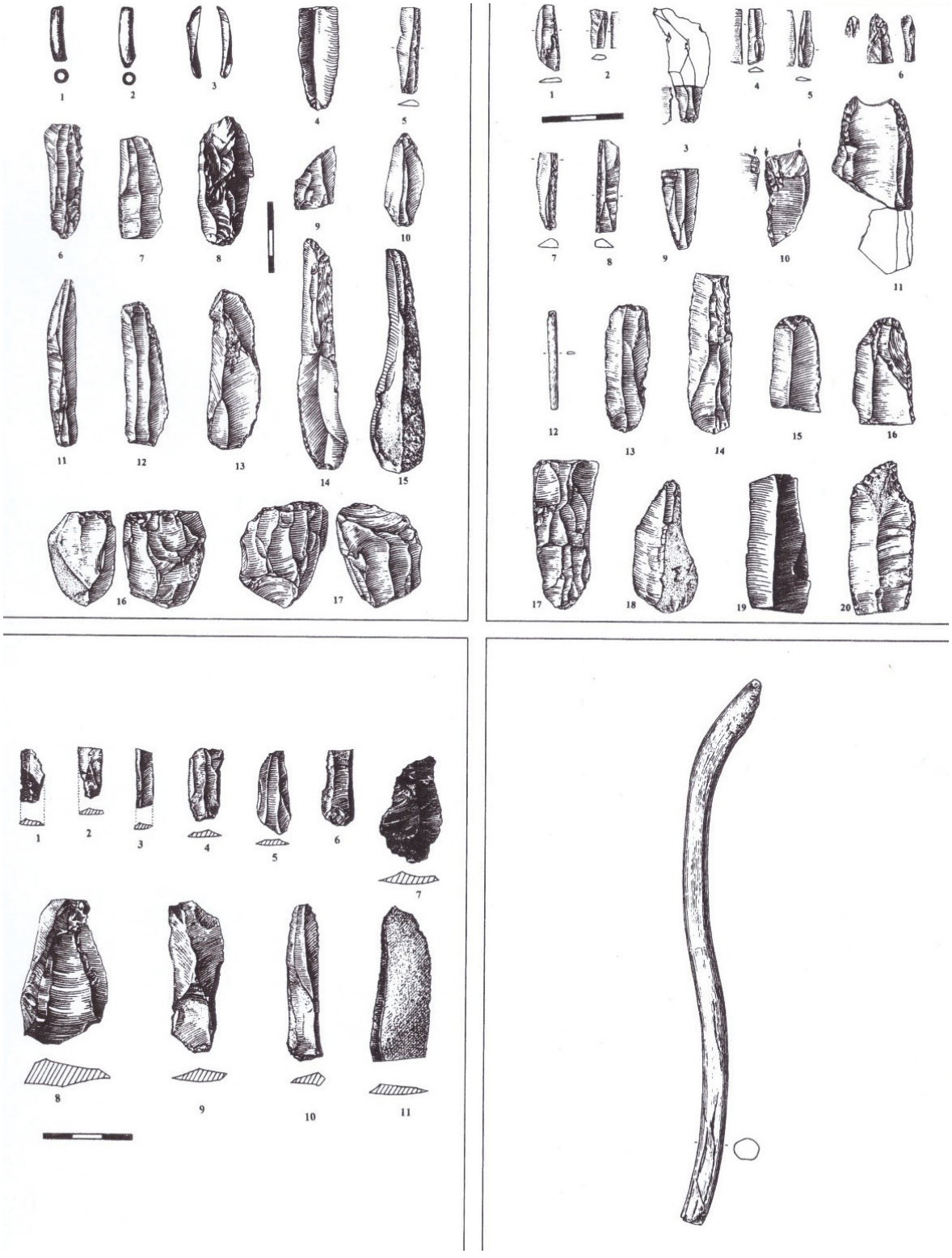

Fig.18: Selected finds from Verunčina jeskyně (Veronica´s Cave).

Srnčí jeskyně (Roe Deer Cave)

This cave, with a collapsed ceiling, is located in the upper most level of the Suchý žleb valley in the cadastral territory of Vilémovice village, at an altitude of 476 metres, 57.5 metres above the bottom of the valley. The first excavations was conducted here by the speleologist K. Pilát in 1912 and 1913. He managed to unearth several fragments of bear bones and one flint artefact. Another excavation conducted here in 1960 and 1961 was led by J. Skutil from the Archaeological Institute in Brno, who distinguished twelve geological layers. On the basis of a humic layer, in an upper part of a loess in front of the cave entrance, a cultural layer containing 48 artefacts was found (Fig. 19). This lithic assemblage consisted of several flakes, bladelets, a quartzite borer, a jack plane-like shaped tool, and a core crest. Artefacts were made of erratic flint, chert, quartzite and radiolarite. A collection of finds was completed by two slate pebbles and cut animal bones. The underlying loess contained a greater amount of debris, animal bone fragments and two flint flakes, which were interpreted by J. Skutil as evidence of an older settlement of the cave, perhaps from the beginning of the Upper Palaeolithic. K. Valoch suggested, that the cave stratigraphy could even reach the Middle Palaeolithic layers. To conclude, the findings from this cave could be interpreted as evidence of the episodic Magdalenian settlement. Older settlement of the cave is also possible, but this is not proven with certainty.

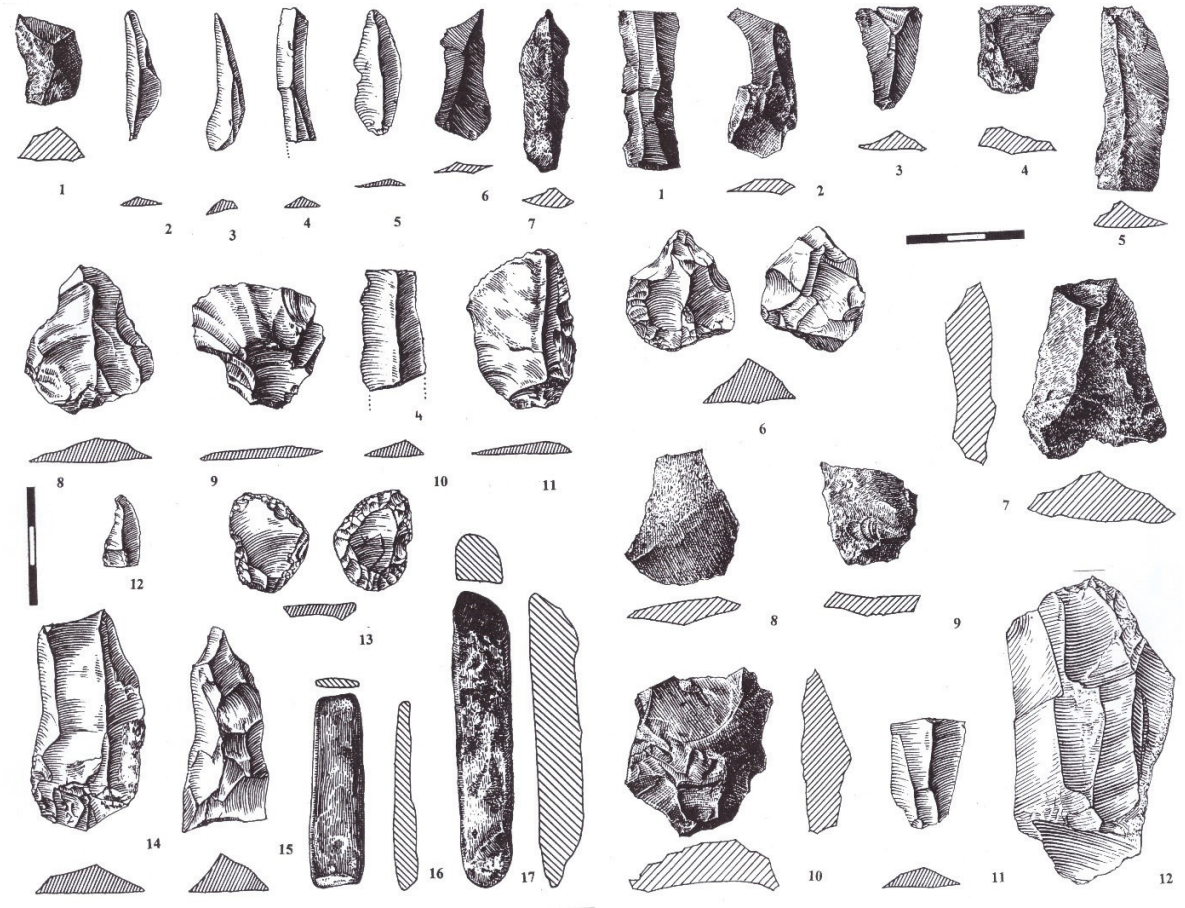

Fig.19: Selected finds from Srnčí jeskyně (Roe Deer Cave).

Smrtní jeskyně (Death Cave)

This cave is situated on the outskirts of Vilémovice village at an altitude of 477 metres, in the central part of the Suchý žleb valley, 53.6 metres above the bottom of the valley, next to the road from Jedovnice to Ostrov. The cave was already well known to K. Absolon. However, he did not report any finds from this site. An excavation was conducted here by J. Skutil in 1960 within the framework of a project by the Archaeological Institute in Brno. J. Skutil described 13 geological layers of a cave stratigraphy. The only artefact found here is a mesial fragment of a patinated flint bladelet, possibly of the Magdalenian age. It comes from

a transversal trench in the cave entrance. A prehistoric hammer made of red deer antler, which was deposited in the school building in Vilémovice, might also have been found in this cave. It can be stated, that from the archaeological point of view this cave is not particularly interesting and that the above mentioned bladelet is just an isolated find.

Rytířská jeskyně (Knights cave)

This cave with an imposing portal is situated at the junction of the Suchý žleb valley and the Punkva valley in the cadastral territory of Lažánky village, at an altitude of 386 metres, 46.2 metres above a bottom of the valley. Testing pits were excavated here in 19th Century by J. Wankel, M. Kříž, and J. Knies. M. Kříž managed to find here several Neolithic pottery sherds. Palaeolithic artefacts were discovered here in 1912 by a school principal in Rudice, H. Sáňka. In 1938 this cave was excavated by J. Simon, who found here bear bones and scarce flint artefacts, including an exceptional leaf point. These findings inspired K. Absolon to conduct a larger excavation here in 1939, which was reported a year later by his son K. Absolon Jr. According to his report, a thin Magdalenian cultural layer was located above a debris horizon, covered by a layer containing the Neolithic pottery. Findings from these older excavations were later published by K. Valoch. A tool assemblage consisted of several end scrapers on blades and flakes, two double end scrapers and a round scraper, numerous burins (mainly burins on concave truncation), borers, retouched bladelets, and a chisel. Antler tools were represented by fragments of Magdalenian antler points. A unique find is a gynomorphic pendant (Fig. 20), reminiscent of "breasted sticks" from Dolní Věstonice rather than female depictions of the Gönnersdorf type, elsewhere typical for Magdalenian art. Another excavation was conducted here by F. Prošek and L. Homola in 1946. This excavation was visited also by J. Skutil, B. Klíma, and J. Petrbok. The excavators distinguished 11 geological layer and they managed to find a Neolithic hearth. J. Skutil excavated this cave again between 1960 and 1962 within the framework of a project organised by the Archaeological Institute in Brno.

Fig.20: A gynomorphic pendant from Rytířská jeskyně (Knight's Cave).

During this excavation he found another chert leaf point, a radiolarite blade, a pointed flint blade, an ivory stick, and animal bones in the rear part of the cave (Fig. 21). Among younger finds he excavated several Linear Pottery sherds, Eneolithic, Bronze Age, and Medieval pottery. In the front part of the cave he excavated an approximately 1 metre high and 5.6 metres long stone wall, interpreted as the remains of a small Medieval cave castle. Test pits excavated here by J. Svoboda and L. Seitl in 1982 did not yield any new finds. Generally, it is possible to interpret the finding situation as a short-term camp of Magdalenian foragers, later disturbed by prehistoric settlement activities and mainly by the construction of a small Medieval cave castle. Interesting finds of two leaf point could indicate an episodic (probably Szeletian) human presence in the cave at the beginning of the Upper Palaeolithic (similarly to the finding situation at the nearby Pod Hradem Cave).

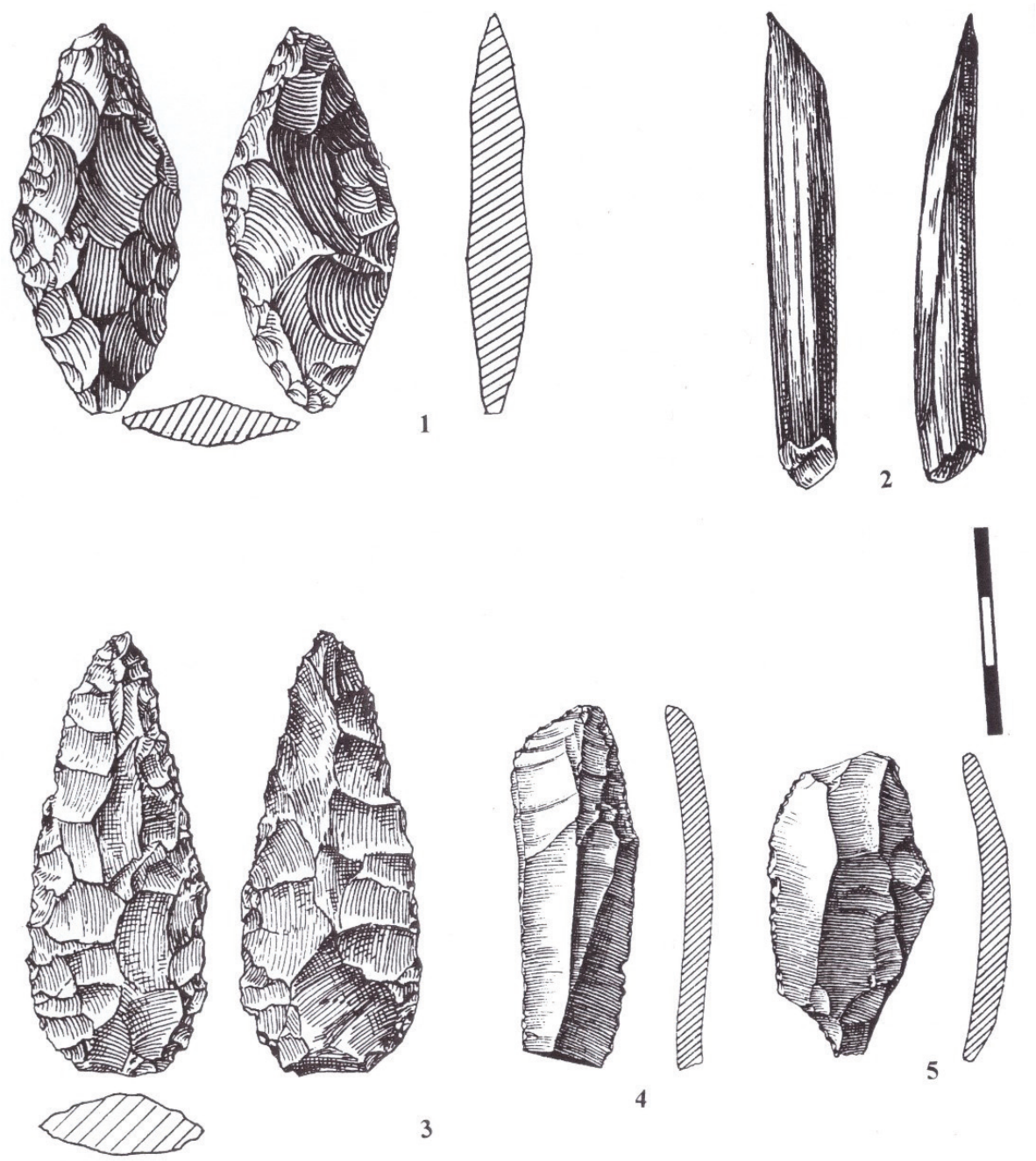

Fig.21: Selected finds from Rytířská jeskyně (Knights Cave).

Koňská jáma (Horse Hole)

This cave is situated at the western margin of the Suchý žleb valley near its junction with the Punkva valley at an altitude of 358 metres, 19.5 metres above the bottom of the valley, on the opposite slope to the Knights Cave, in the cadastral territory of Suchdol village. It was already well known to M. Kříž and K. Absolon. However, it was J. Skutil, who conducted an excavation here within the framework of a project of the Archaeological Institute in Brno between 1960-1962. This excavation was focused on the rear part of the cave. He found eight animal bones and four flint tools (an end scraper on blade, a burin, and two fragments of bladelets with oblique transversal retouch), which were probably washed off from the front part of the cave. A Neolithic hearth with sherds of Linear Pottery and a piece of rock crystal were found underneath a cave chimney. A special find was a sherd of an anthropomorphic vessel with a relief of a human face. Other pottery sherds found during this excavation were dated back to the Neolithic, Iron Age, and Middle Ages. Lower cave levels were without finds. M. and A. Štrofs conducted another archaeological excavation here between 1973-1976. They managed to enlarge the assemblage of Linear Pottery sherds. The finds of two bladelets, a Tertiary mollusc shell, and animal bones can be dated back to the Magdalenian. Obviously, this is another cave, which was episodically visited by the Magdalenian hunters. The cave was occasionally visited also in later periods, especially by the people with Linear Pottery Culture in the Neolithic. Some ritual activities could have taken place here.

Indistinctive proofs of human presence during the Upper Palaeolithic were found also in the nearby caves **Umrlčí/Vlčí (Deadman/Wolf Cave), Kravská díra (Cow Hole), and at the entrance to Kateřinská jeskyně (Catherine's Cave)**. All the above mentioned finds provide evidence that the Magdalenian hunters of reindeer and horses frequently visited, apart from the central settlement caves, also smaller caves in their vicinity, which could serve as hunting stations, places of ritual activities or as a short-time shelter in a bad weather.

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Kateřinská (Catherine) Cave

The entry to the Kateřinská Cave is situated in the deep Canyon of Suchý Žleb near the Skalní mlýn Information Center. The access is through an entrance passage leading to the Main Dome, known for ages. With the size of 96 × 44 × 20 m the Main Dome is the largest underground space accessible to the public to be found on the territory of the Czech Republic. For its excellent acoustics the cave is occasionally used for vocal and instrumental concerts. The cave includes the New Catherine Cave discovered in 1909 by Karel Absolon's group of spelaeologists. The beauties of the cave include the stalagmite Witch lit by spotlights of different colours, and the Bamboo Forest, a group of rare, several metres high stick-shaped stalagmites. The entrance portal is a significant archaeological and paleontological monument. There is also the unique finding of a mass of skeletons of cave bears in one of the chimneys of the cave.

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source: https://visit.caves.cz/en/cave/katerinska-jeskyne.

The Oldest Cave Drawings in the Czech Republic, about 6200 years old

Petr Zajíček, Cave Administration of the Czech Republic Blansko

Old writings and abstract drawings were found on the walls inside of the Catherine (Kateřinská) Cave (Fig. 22). In 2019 chosen charcoal abstract paintings were analysed using radiocarbon dating analysis to determine their absolute age. Two of them are in s.c. ice passage, the other one was found in s.c. nameless passage. The analysis shows that they were created about 6200 years ago, at the time of Neolithic settlement of the cave portal. They´ve been the oldest proved drawing attempts in Czech caves.

The research and analyses were provided by Cave Administration of the Czech Republic, Palacký University Olomouc and Nuclear Physics Institute of the Czech Academy of Sciences.

Fig.22: Kateřinská Cave, the oldest cave drawings in the Czech Republic.

Býčí skála - Magdalenian occupation

Martin Oliva, Moravian Museum Brno

Býčí skála *(Stierfelshöhle)*, cave no. 1185, cadastre of Habrůvka, Blansko district. The Býčí skála Cave is situated in the middle part of the Moravian Karst. It represents the lower part of the Jedovnice brook system, which starts with the caves of Rudické propadání. It was probably in Býčí skála Cave where, in 1870, Dr Heinrich Wankel discovered the first traces of Palaeolithic period within the territory of the Austro-Hungarian Empire. The Magdalenian settlement was concentrated in two entirely dark areas 90–100 m from the entrance (Fig. 23), the so called Southern and Northern Branchings. In addition to the higher temperature and a source of water, a great advantage of the site was a wealth of material suitable for flaking. The Giant Chimney rises halfway through the length of the main corridor. A large quantity of chert gravels lie below. Previously chert of Jurassic formation used to be designated as quartzite.
The temperature in the Northern Branching never drops below 10 degrees, even in winter – this is approximately 30 degrees more than what the outside temperature would have been on the coldest days of the year. It was not necessary to leave the cave to obtain water, since it was available in Bull Lake *(Šenkův sifon)* at the end of the main corridor. However, a severe disadvantage was dampness, darkness, and a lack of a view of the valley through which game animals certainly migrated from time to time. Horse bones dominated around the fireplaces in the Southern Branching. If campfires served mainly as sources of heat for people and of charcoal for roasting elsewhere, in this place they were also important as source of light. This increased demand for fire, especially in winter, when the cave was occupied,

Fig.23: Entrances into the Býčí skála Cave.

was at odds with the lack of fuel, which had to be brought in from outside. This is no doubt mass chipping of chert related to its local incidence, but mainly to the psychological atmosphere created by a tight, dark space that called for an activity to become engaged in with few options to choose from. Moreover, routine chipping of chert does not require a lot of light. Apparently, this work was lacking in either practical or supply importance, as evidenced by the numerous unretouched blanks and unused tools made from other raw materials, as well as the scarcity of export of products to other sites. Radiocarbon dates from Býčí skála are relatively high (17 to 15 thousand years uncalibrated BP), but they are accompanied by rather advanced inventories.

Leaving aside the artefacts made of local chert, the second most numerous group of artefacts consists of erratic flints (69% exclusive of local cherts), in spite of the fact they had to be brought from a minimum distance 120 km to the north. Far fewer are the numbers of radiolarites, undoubtedly imported mainly from the White Carpathians (8%, 100–120 km to the east), Cretaceous spongolites from the Svitava River valley (5.7%), cherts of Olomučany type (2.6%) and other cherts of mainly Jurassic origin (5.6%), all of these accessible within an hour's expedition. The incidence of high-quality flints of the Cracowian-Czenstochowa Jurassic formation (1.1%; 240 km) and chocolate-type silicite from the Holy Cross Mountains (0.9%) brought from nearly 400 km distance suggests the scope of contacts, whether direct or mediated. The mentioned raw materials occur in similar ratios at the other Magdalenian sites in the Moravian Karst as well, but the chocolate-type silex is limited only to the Pekárna Cave and layer 6 in the Kůlna Cave. Admittedly handling of all these raw materials varies a lot, and a common rule applies: the farther the origin of the rock material, the more advanced is its reduction.

Formal tools amount to less than 30% among the brought raw materials, and roughly three times less among local cherts. The typology does not go beyond the scope of the usual Magdalenian industries: endscrapers slightly prevail over burins and form the most numerous group (18%), but only because the small backed bladelets escaped attention during amateur excavations. The best quality endscrapers were made on blades of a very distant origin; nevertheless, they belong to the longest, or the most elongated (Oliva, 2015a).

The bone and antler industry is rather sparse, consisting of 6 fragments a of antler spears, some eyed needles and cut antlers. A specific phenomenon in Býčí skála are grooved pebbles, the best-known engraved pebble was even found in front of the cave (Fig. 24, Oliva, 2015b).

Only isolated and inconspicuous chert artefacts were found in lower levels below the Magdalenian layer. Their number and importance were heavily overestimated in older literature.

Fig.24: Býčí skála Cave, engraved slate pebble.

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The Býčí Skála Cave princely sanctuary/tomb in Ha D1b–D3

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The Býčí Skála Cave is a specific site not only in Moravia but also in Hallstatt Europe. Although a great deal of scientific opinion has been written about it in almost 150 years, there are still many misinformations about their basic parameters. In 1872, H. Wankel – „the father of Moravian prehistory" – discovered unique find in the Entrance Hall of the cave. It contained a large number of elite items – parts of four-wheel wagons, iron weapons, bronze, glass and amber jewelry, and remnants of a luxury items workshop. Three years before, in 1869 was found a bronze figurine of a bull with iron intarsia, which became a symbol of this find. Also 40 human skeletons, large amount of animal bones and other finds were described in the Entrance Hall. They have been deposited in the NHM in Vienna since 1883 (Parzinger et al. ,1995). The authors of this text have been devoted to this locality – Martin Golec since 2007 and Zuzana Mírová since 2017. They combine the principle of speleoarchaeology, get to know the cave and its surroundings, and archaeology. The latest detailed site-specific description of the site has been published recently (Golec, 2017). The concept of the cave sacrificial site interprets the Hallstatt site in a monofunctional way, which does not fully cover all the ranges of findings discovered by Heinrich Wankel (Wankel ,1882). The most important for the contemporary conception of the site is the funeral function, which the authors discuss on the basis of a new analysis of four-wheeled wagon components and the votive function, which points to hoards deposited in the "open landscape" of the Platěnice group. The elite has become the red thread, which we monitor not only in the Býčí Skála Cave, but throughout Moravia. This comparison points to the hegemonic importance of the site, which we explain as a means/outcome of the process of centralizing the socially and politically most successful social group, which probably began to interfere with both the Horákov and Platěnice groups. It is a central sanctuary and due to its location still situated in an unoccupied landscape, it had to be reached by the planned route and is therefore a pilgrimage sanctuary. From a chronological point of view, the sanctuary was institutionalized around 575 BC (Ha D1b) and was still used in Ha D3, i.e. approximately up to 450 BC (Ha D1b = 575–550 BC, Ha D2 = 550–500 BC, Ha D3 = 500–450 BC). The concept of a site as a remnant of a one-off process cannot be said in any perspective. The new socio-political hegemon probably started to use the Býčí Skála Cave as a new signatory of his successful role., the funerals of the ruling group – the donators of the sanctuary – laid on the ceremonial four-wheeled wagons, which we take not as sacrifices but as funeral wagons, played a key role here. Within Hallstatt Europe, we know only such use of wagons and it is most natural to believe that this was the case. Our view is consistent with the previously published concept of H. Peter-Roscher about the cave burial ground with the confession of the cult of the dead (Peter-Röscher, 1998), which we now describe as a cave tomb within the sanctuary. The burials can then be seen as graves. The cult of the dead then helped the applying group to raise social status during the period of centralization. Such an approach respects The prestige goods theory (Friedman, Rowlands ,1977), which discusses, among other things, the growth of political power in relation to a mystical ancestor whose protection reinforces the legitimacy and importance of the ruling center. The greater its cult and protection, the more politically strong the ruling clan and greater the social stratification; centers are gaining importance; there is a larger acquisition of luxury items, the function of which, however, is separate from the objects of the general economy of society and serves only to increase the

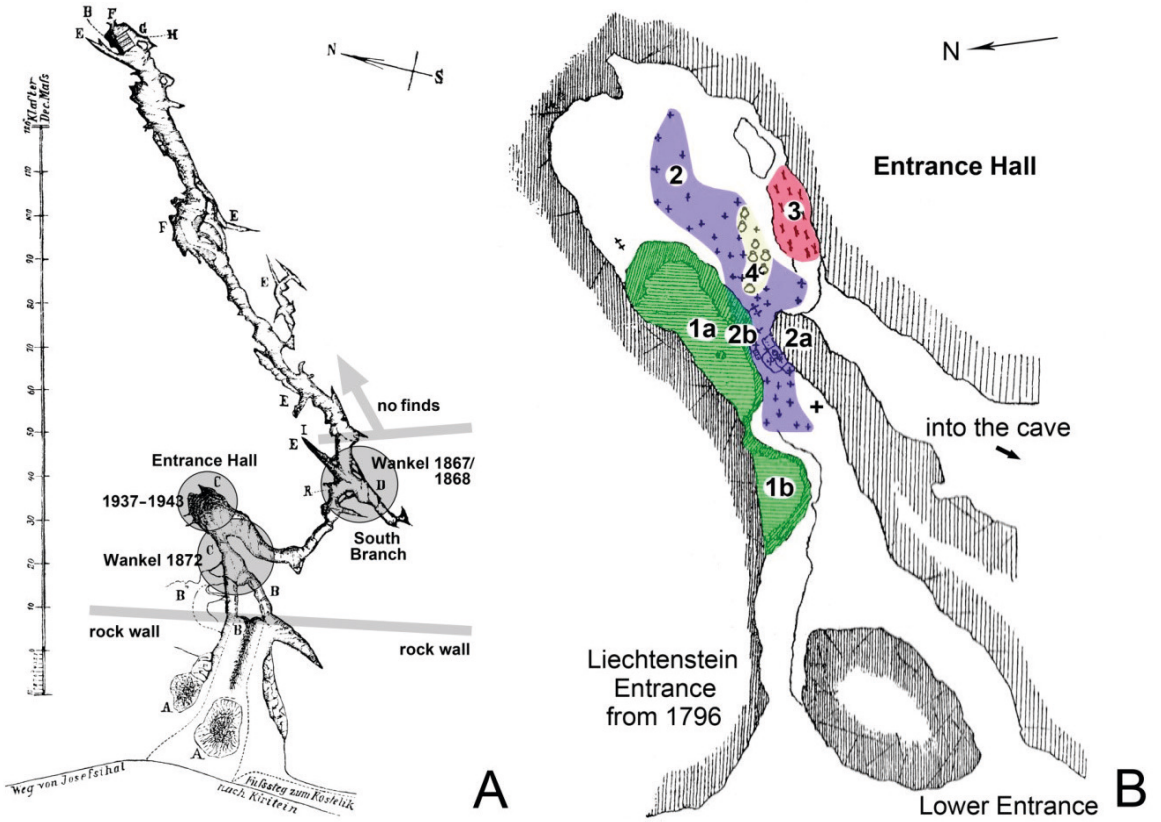

Fig.25: A – Maps of the Old Býčí Skála Cave from 1871. They mark both positions examined by H. Wankel – the South Branch (since 1867/1868 many times also by other researchers) and the Entrance Hall (1872 and later, 1937–1943), (source A. Špaček and M. Golec); B – map of the finding situation from 1872 indicates that the area was probably divided and used in a different manner (practical functions): 1 – the so-called small (1a) and large (1b) cremation grounds (rather rotting ground), i.e. the places of deposition of items without human skeletons, the exception is Wankel´s magnate in 1a (the skeleton in context of the wagon V1 designated by Z. Mírová and M. Golec); 2 – the so-called burial ground, the area of artefacts deposited (as long as proved by the sources, together) with human skeletons, described also the so-called stone pavement (2a) and the so-called altar with the surrounding concentration of skeletons of princess with luxury items including Wankel´s princess with gold earings (2b); 3 – the so-called forge referring to a crafts workshop; 4 – a large concentration of pottery along with other finds (Wankel 1882, Fig. on page 383 and interpretation by M. Golec).

status of individuals and institutions. However, the remains of other operations, such as the depositing of the remains after the craftsmanship or without the burials of separated hoards–vota, were also added to the funeral function (Fig. 25:B). The Býčí Skála Cave is not a vertical (shaft) cave, but horizontal cave (stone house).

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Výpustek Cave and its surroundings

Petr Neruda, Moravian Museum Brno

Výpustek Cave

The extensive cave system called Výpustek can be found on the left slope of Křtinské Valley about 1.6 km from the town of Křtiny (Fig. 26). The lower entrance to the cave (now entrance 1) is about 11 m above the valley floor (Fig. 27a). Entrance 2 is better preserved and can be found a few metres higher and to the west. The other two entrances were excavated for military purposes.

Fig.26: Map of caves near Křtiny Market Town (the source www.mapy.cz).

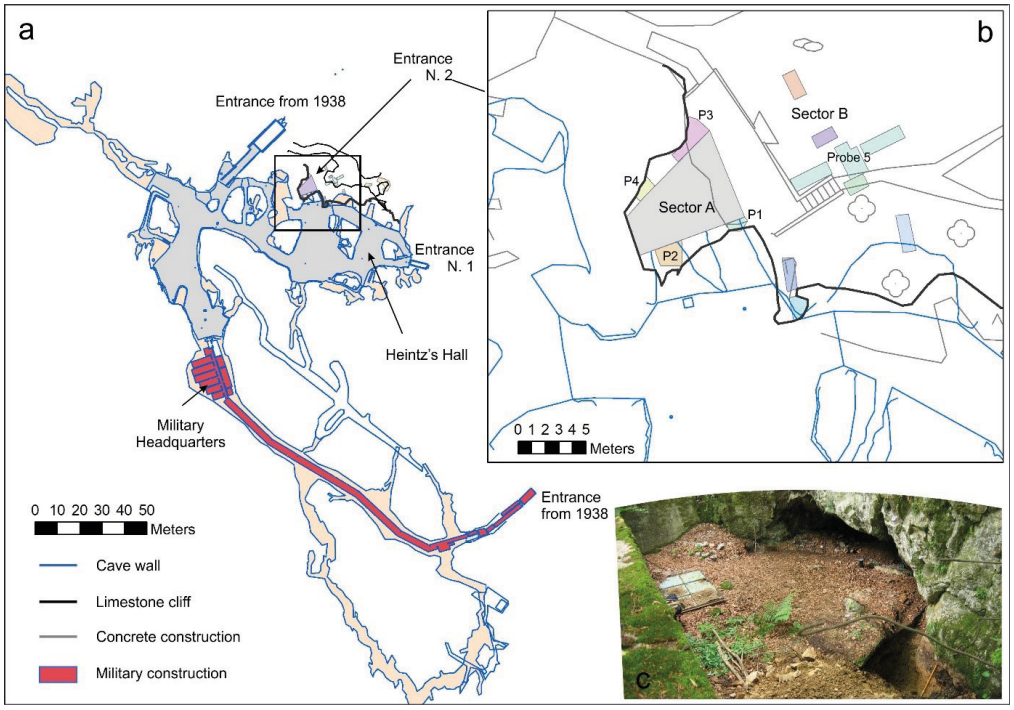

Fig.27: a- Plan of the Výpustek Cave, b – the detail of the second entrance with position of probes, and c – Entrance 2.

Výpustek Cave is one of the oldest known Moravian caves. The first records date back to the beginning of the 17th century (for the history see Musil, 2010). A number of speleological and archaeological surveys have been carried out in the cave, some of the modifications to the terrain inside the cave were connected with an effort to make the cave accessible to the public (the end of the 19th century). From the archaeological point of view, one of the most important surveys is considered that carried out by Heinrich Wankel. In 1870 he found a large number of vessels in what is now called Heintz's Hall (Fig. 28). This find has now been associated with the younger phase of the Linear Pottery culture (Wankel, 1871).
Výpustek was the first locality where this culture was found. In addition to these finds the thick layer of coals and ash yielded the bones of sheep, pigs, bone awls , shaft axes and a polished axe (Fig. 28). During later surveys led by Ferdinand Hochstetter (Professor of Mineralogy and Geology, University of Vienna) in 1882 a skeleton of a child (6-7 years) was found. This is now skeleton number 5 in the collections at the Naturhistorisches Museum in Vienna. This indicates that perhaps more individuals were buried here. It is thought that the situation as a whole was a ceremonial site associated with burial rituals (Oliva, 2019).

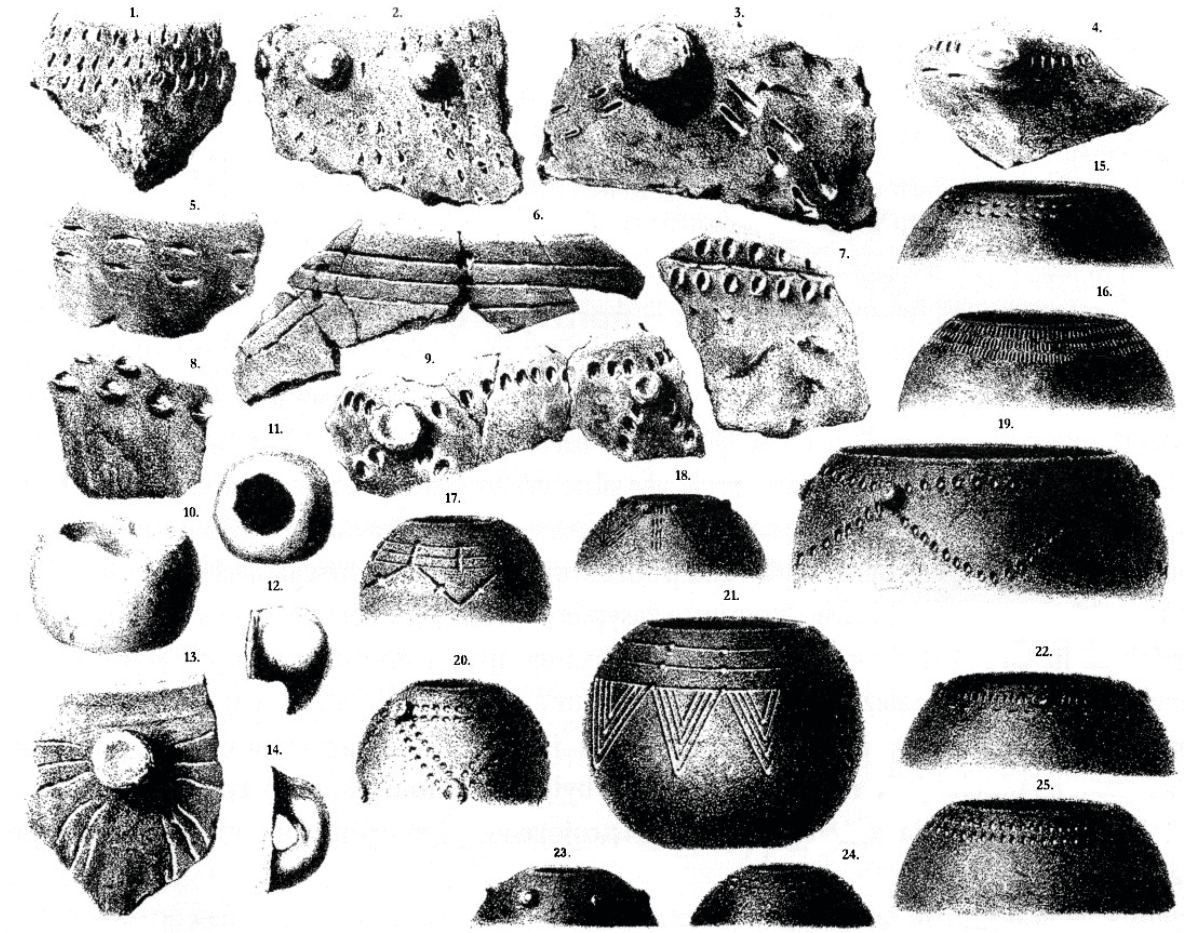

Fig.28: Neolithic findings from Heintz Hall (Wankel 1871).

After the First World War, the cave fill was almost completely destroyed by mining the phosphate clays. These reached a thickness of up to 6 m in places. During World War II, a large part of the cave was modified for the needs of factory production. To make this "Boiler room" (Fig. 29), a part of the cave was blasted, thus destroying the remains of any intact archaeological situations. After the war, the Czechoslovak Army built a reserve command post in the cave in the event of war.

Fig.29: Výpustek Cave – „boiling room" (photo P. Neruda 2011).

In 2010, the forefront of what is now Entrance 2 was tested in order to determine its archaeological potential for finding intact archaeological structures, or even to reconstruct the history of the cave's settlement.
Four small probes were placed on the edges of the concrete slab in the portal to the cave (Fig. 27b). The slab was laid so fuel could be transported for "Hitler's boiler room" (a local name), which served to heat the factory located inside the cave. Relics of Pleistocene sediments were found in the northern part; however, they did not contain any archaeological material. Only the bottom of the third probe uncovered a part of a rhinoceros pelvis.
The probes located to the south of the concrete slab only revealed sediments that had been dug over with archaeological finds mixed with sub-recent material. According to the available information, it can be assumed that there were two entrances of a chasm-like nature that were situated on the left (south) side of the portal. Pleistocene sediments were deposited into these chasms. The chasms were later filled with sediments from the inner part of the cave during World War II. They contained archaeological materials of varying ages and indicate the cave was settled in several stages. Bearing in mind the materials originating from the carbon-bearing sites on the cave walls, it can be stated with certainty that the cave was used during the Šárec Phase of the Stroke-ornamented ware pottery culture, in the Lengyel period, in the Bronze Age and probably later too. It cannot be ruled out that some findings of the stone knapping industry (e.g. a discoid nucleus) may even date from the Palaeolithic period.
The talus cone in the forefront of the portal was completely removed in the past in connection with altering the entrance. The sediments in front of the concrete wall, however, are intact. They are only covered by a thin layer of relocated sediments, which were used to level the forefront of the cave. Georadar measurements have shown that there should be up to 4 m of soft sediments that sit above the limestone bedrock. At a depth of about 5 m they contain an indication of another, lower level of the cave system.
The findings were mainly verified by a system of several probes located in the foreground of the cave. They captured an undisturbed stratigraphic sequence from the Holocene until the period of about 40,000 years BP (Fig. 30). Deposited under the preserved Holocene formation was a layer of loess sediments with a lower content of limestone clasts (layer C), which had only been sporadically preserved in the cave foreground. The largest part of the profile

included layer D divided into three sub-layers on the basis of the change in the sediment's structure and colour. This horizon contained a significant proportion of large limestone clasts, and sedimentological analysis showed that sediment deposition should take place even below the cave portal. The situation as a whole has been interpreted as evidence of the retreat of the original cave portal.

The remains of Linear Pottery culture were found In the Holocene sediment. They are represented by fragments of ceramics and a quern-stone. This phase of settlement probably corresponds to the use of a cave as a burial place (see the findings of Heinrich Wankel in Heintz's Hall). Keeping on the basis of the Holocene strata, a distal fragment of a patinated blade with slight edge retouching at the apex was found. The isolated bones of a horse and bovids were then found in the lower sediments, C/D and D, however, they were without visible anthropic interventions. Nor did these sediments contain unambiguous stone artifacts.

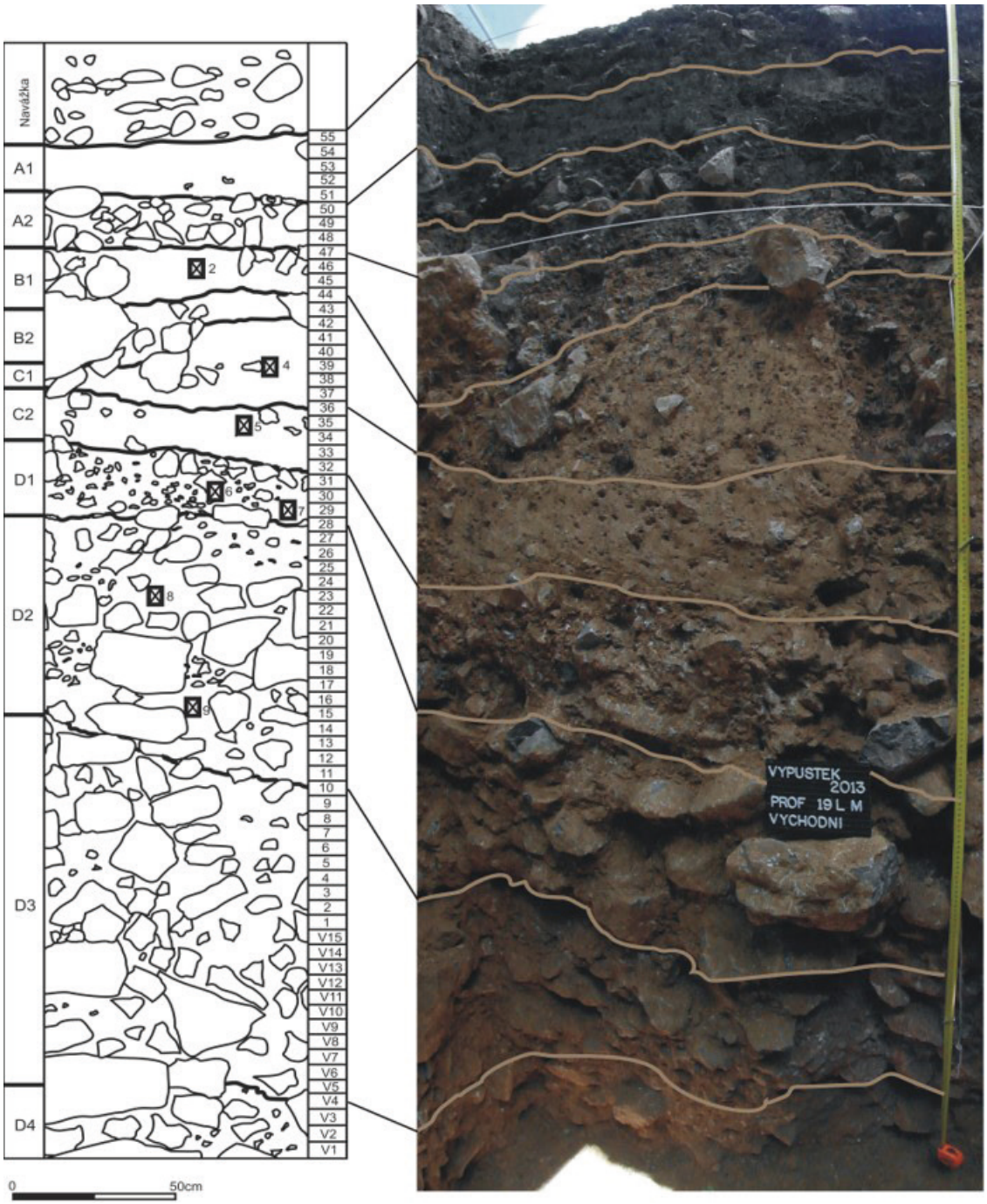

Fig.30: The cross-section in Sector B, Probe 1 (digitalization P. Neruda, L. Lisá and K. Adameková).

Nová drátenická

The cave is located in a limestone body on the southern side of the valley formed by the Křtinský stream approximately 1.4 km from the town of Křtiny (Fig. 26). The small entrance opens to the NW at an altitude of 393 m, about 12 m above the valley floor (Valoch et al., 2002).

The cave was discovered in 1947 during research into the cave system of the Drátenická Cave, which is connected with the Nová Drátenická (New Drátenická) Cave by a narrow corridor. Breaking through the calc-sinter floor in the wider area, which is connected to a small entrance in the limestone cleft, revealed intact sediments containing stone knapping industry and paleontological material (Fig. 31). The research was carried out in 1948 by Bohuslav Klíma in cooperation with J. Pelíšek and Z. Hokr (Klíma, 1949).

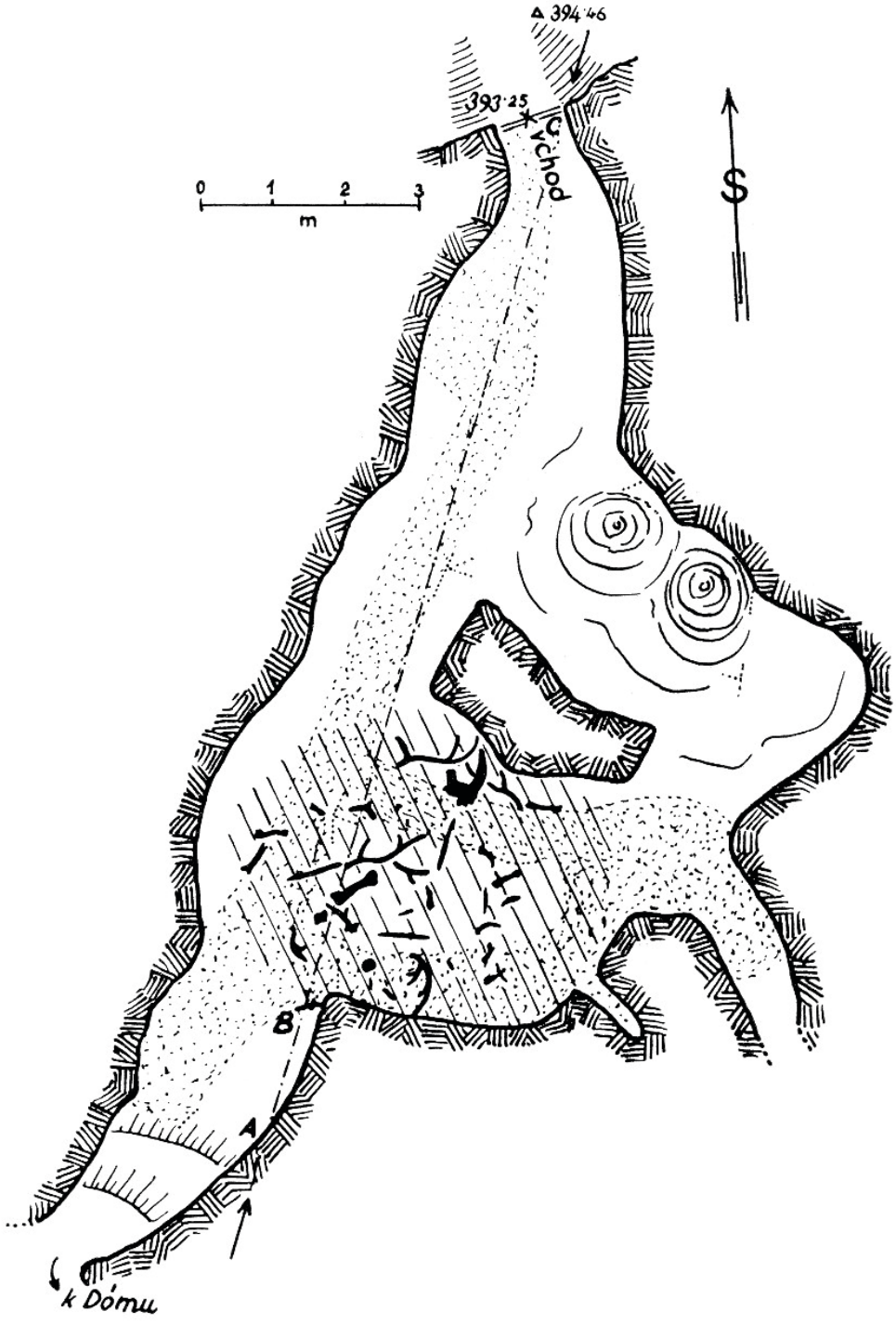

Fig.31: Plan of Nová Drátenická Cave (Klíma, 1949).

Eight geological layers were distinguished during the research, while the Palaeolithic layer (Layer 5, Fig. 32), usually associated with Magdalenian, appeared as a grey site on a base of loess loams 6. The subsoil contained a site of broken travertine (4), which lay on a lighter loess loam (3).
The cave is primarily known for its three unique bone points, which, however, differ in shape from the usual Magdalenian inventory (Fig. 33). The tip of each point is formed into a kind of beak, from which a groove protrudes, which was meant to either drain blood from the wound, or could serve, as some researchers believe, for stone blades with a blunted side to sit in. This would create a sharp cutting edge causing greater injury to the prey animal. One of the points even has two such grooves opposite each other. The bases of the points are pointed and zigzag grooves have been carved out.

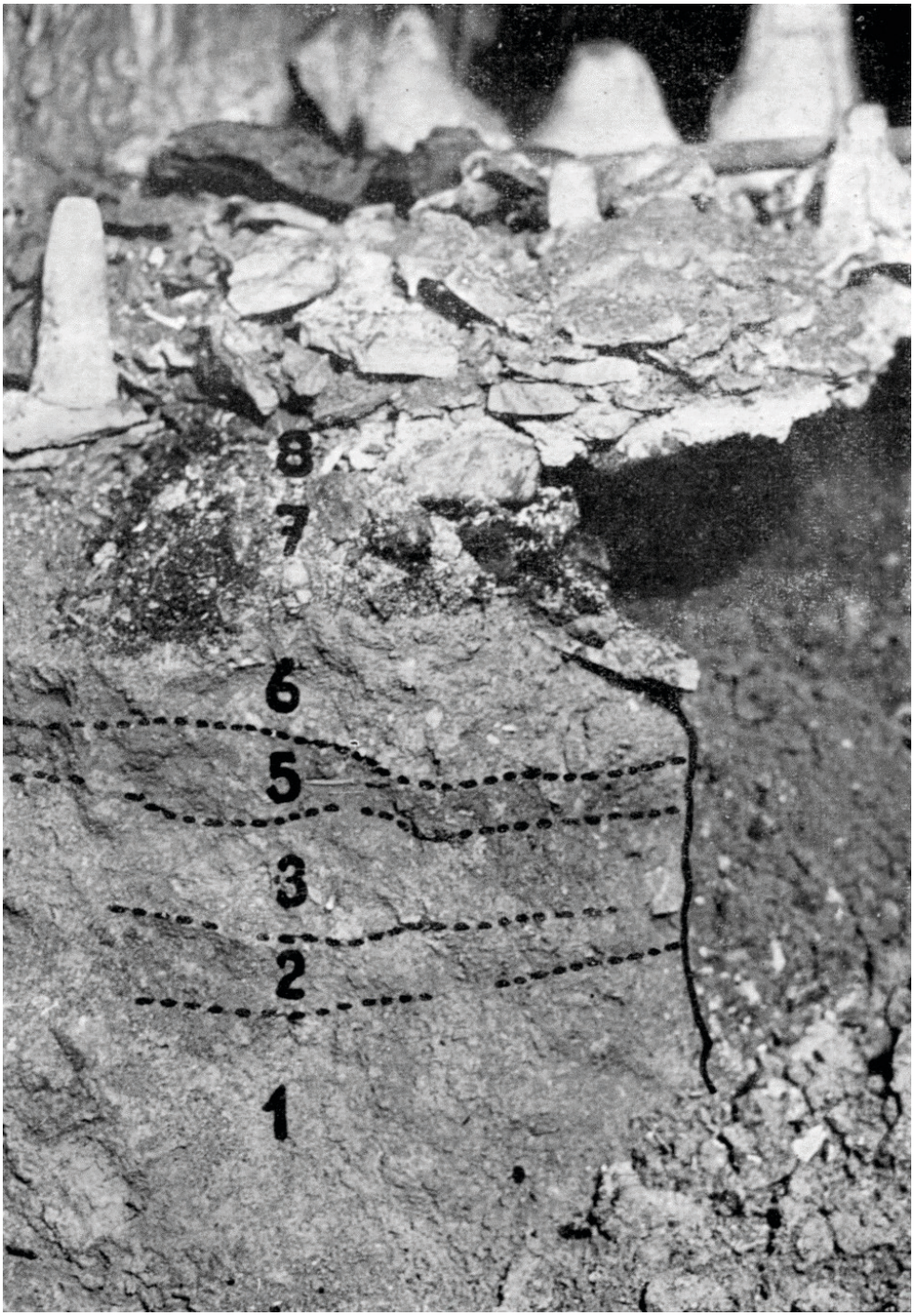

Fig.32: The stratigraphical section in Nová Drátenická Cave (Klíma 1969).

The cave is primarily known for its three unique bone points, which, however, differ in shape from the usual Magdalenian inventory (Fig. 33). The tip of each point is formed into a kind of beak, from which a groove protrudes, which was meant to either drain blood from the wound, or could serve, as some researchers believe, for stone blades with a blunted side to sit in. This would create a sharp cutting edge causing greater injury to the prey animal. One of the points even has two such grooves opposite each other. The bases of the points are pointed and zigzag grooves have been carved out.
The points lay in the cultural layer that was hidden under the calc-sinter floor in the first extension of the entrance hall behind the rock pillar, which stands in the middle of the area. In addition to unretouched spears, B. Klíma and his colleagues also uncovered blades and microliths with a blunted side, which are typical of the Moravian Magdalenian (Fig. 34). The stone tools were in a layer with the bones of a reindeer, an ibex, snow fox or hare, and could be the remains of the animals caught. In his research report B. Klíma also mentions the use of fire. In the original research report, B. Klíma mentions the finding of a talus, which palaeontologist Z. Hocker identified as human, and Klíma believed that under the sinter floor there may be further remains of people from the early Palaeolithic. Naturally, this cannot be ruled out, however, according to a new examination (R. Musil, M. Roblíčková, Z. Tvrdý), the ankle bone found in the collections of the Moravian Museum comes from a bear.

Fig.33: Three bone points from Nová Drátenická Cave (photo P. Neruda).

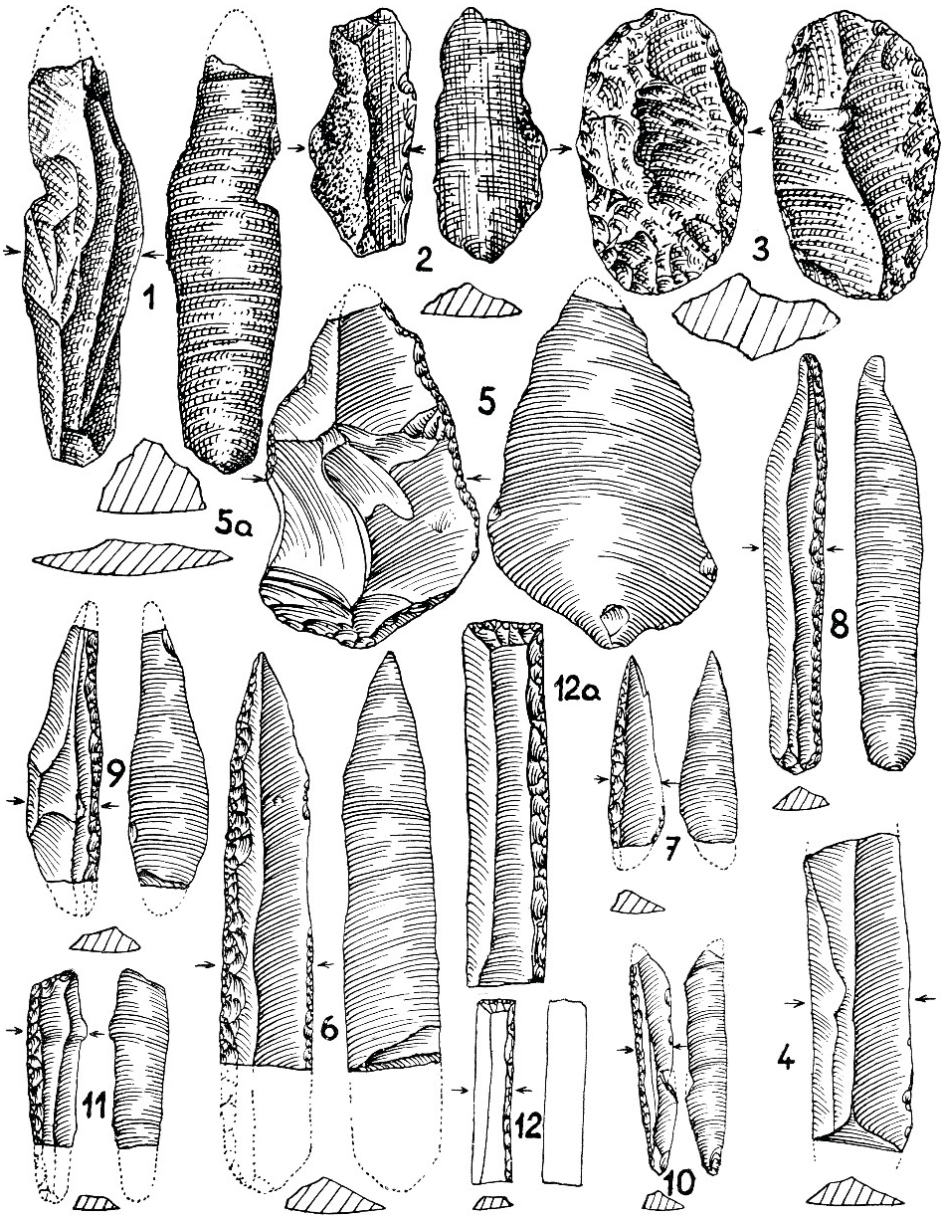

Fig.34: Lithic artefacts from Nová Drátenická Cave (Klíma 1969).

Probably the biggest problem to date is determining the age of the objects found. Radiocarbon dating of the animal remains provided 3 dates, which are quite far apart. In 2002 (2002, 214–215) K. Valoch commented on the collection's homogeneity, expressing doubts as to whether all the findings really do relate to the Magdalenian layer. Without doubt there is a reindeer antler fragment from the layer of the findings which gives the earliest date (OxA-1952 about 13,500 calBP); both the following data (OxA-1953 and OxA-1954: 15,600 and 17,000 calBP) come from compact bone fragments from various locations, however, according to Klíma's report, it should be the same stratigraphic horizon. But, such a large range of dates is difficult to explain. The only possible explanation is that carnivores beasts were bringing their catch into the cave, long before it was visited by Palaeolithic hunters.

Table of dates:

Sample ID	**14C data**	**material**
OxA-1952	11670 ±150	antler
OxA-1953	13870 ±140	bone
OxA-1954	12900 ±140	bone

Drátenická

In the 1920s František Čupik found two chert artefacts and animal bones on a phosphate clay slag dump. A two-sided artefact is of particular interest, which K. Valoch (1999) likened to the Micoquien wedge-shaped instruments from the Kůlny Cave. In any case, both findings from the cave suggest that the Drátenická cave was used by Neanderthal hunters.

Žitného jeskyně Cave

In the limestone spur with low cliff faces about 650 m southwest of Křtiny there is the small Žitného Cave, which quite unexpectedly provided unique evidence of the lives of Magdalenian hunters in Křtinské údolí (Fig. 26). The entrance, which opens to the north, is located about 30 m above the valley floor at an altitude of 414 m (Fig. 35 and 36). In the cave itself, which was first investigated by J. Szombathy in 1883, there were not many artefacts; however, in the talus cone at the forefront of the cave (Fig. 37) K. Valoch managed to obtain a valuable collection of artefacts by means of a systematic interdisciplinary research (Dvořák et al., 1957).

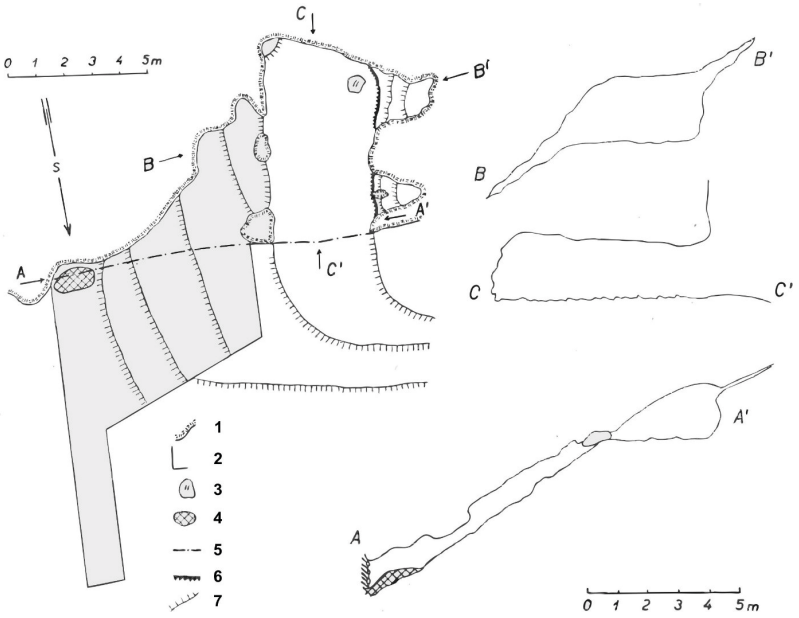

Fig.35: Plan of Žitného jeskyně Cave. 1 – limestone massive rock; 2 – extension of the probe; 3 – isolated rock; 4 – multicoloured clay, 5 – drip line; 6 – vertical rock step and 7 – contour line (Dvořák et al. 1957).

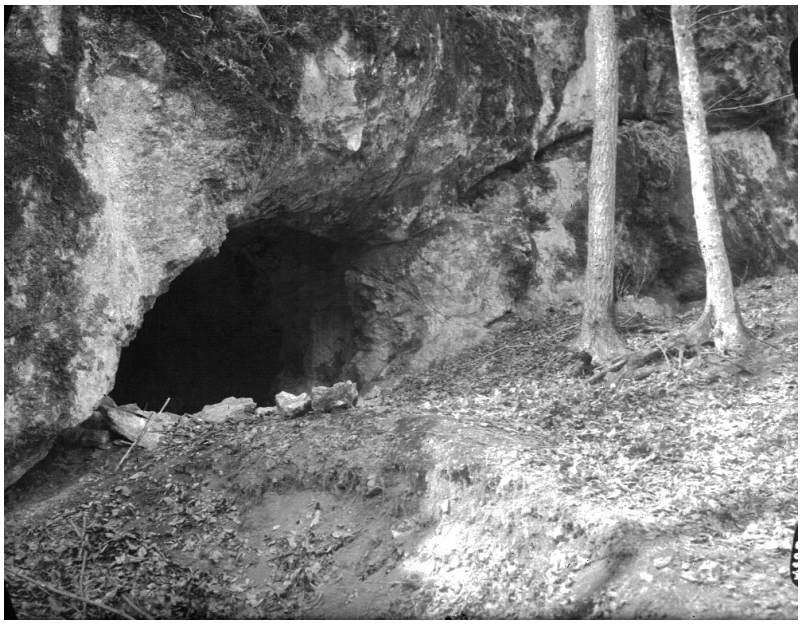

Fig.36: The entrance of Žitného jeskyně Cave (photo K. Valoch 1953).

The most interesting objects were made of crystal. The use of this material is not unique in the Moravian Karst, as evidenced by findings from other karst localities, but nowhere else has there been so many flakes, blades and retouched crystal instruments as here (24% of all findings). The nearest sources can be found in the Bohemian-Moravian Highlands, where the presence of Magdalenian hunters (Valoch 2004) was proven in association with looking for suitable crystals with which they returned to the Moravian Karst area. Moreover, considering that this material is not best suited for knapping because the inner crystal structure affects the force's spread after striking, then it would seem that the main reason why the Magdalenian hunters invested so much energy in obtaining and processing it is linked to its attractiveness. The findings from Žitného Cave hide yet another unique artefact. It is the largest bone needle with an eye that has so far been found in the Moravian Magdalenian (Fig. 38). The other needle fragments are similar, for instance, to those found in Pekárna Cave, but are much smaller.

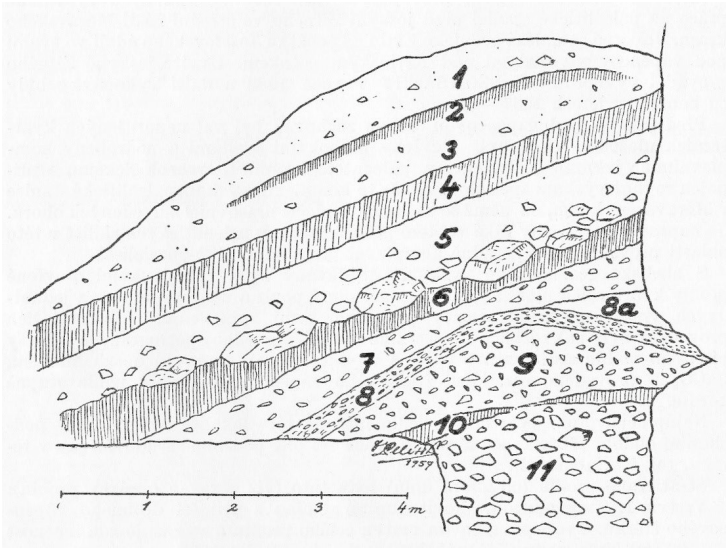

Fig.37: The cross-section recorded in front of Žitného jeskyně Cave (Dvořák et al. 1957). 1–4 recent and Subatlantic, 5 – Subboreal, 6 – Atlantic, 7 – Boreal and Preboreal, 8–9 Würm 3 (Layer 8 – the Magdalenian horizon), 10 – interstadial Würm 2-3, and 11 – Würm 2.

Fig.38: A unique needle from Žitného jeskyně Cave (centre) in comparison to a recent one (right) and to a needle from Pekárna Cave (left).

Other findings of stone artefacts made of imported erratic silicites or radiolarites, or antler tips with a cut base, fully fit in with the classic inventory of Moravian Magdalenian sites. It is, however, necessary to mention that after the Balcarka Cave near Ostrov u Macocha, the findings from the Žitného Cave are the second oldest collection from the Magdalenian in our territory. The calibrated radiocarbon date puts the settlement of the cave's foreground in the period around 16,000 years before present (Valoch, Neruda, 2005).

Acknowledgements:
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Pilgrimage Church of the Name of the Virgin Mary in Křtiny

Ondřej Mlejnek, Brno

The Church of the Name of the Virgin Mary is a Baroque pilgrimage church in Křtiny (Blansko district) in the central part of the Moravian Karst, which was built in a first half of the eighteen century according to a project designed by the architect Jan Blažej Santini-Aichel. The church, the adjacent Saint Anne Chapel, and a building of a former provostry dominate the Křtiny valley. In 2008 the entire pilgrimage compound was proclaimed a National Cultural Heritage Site of the Czech Republic.
The small town of Křtiny (836 inhabitants) is located circa 14 kilometres north-east of Brno. It became famous mainly because of pilgrimages to the stone Gothic sculpture of Virgin Mary, which was created probably around 1340. The main pilgrimage takes place here annually on Pentecost Sunday (fifty days after Easter Sunday). The first written evidence of Křtiny dates back to 1237, when Křtiny was noted as one of the villages in the property of the Premonstratensian monastery in Zábrdovice, which is now a suburb of Brno. As early as the end of the 13th Century a church stood here and later there were even two Gothic churches built in Křtiny, the result of growing numbers of visiting pilgrims. A smaller building, the so-called Czech church, used to stand at the place of the current church, whereas at the place of the current Saint Anne Chapel a bigger so-called German church was built. In the first half of the 18th Century, both churches were renovated, which provides evidence that

at that time there were no plans to build a new church. However, the new abbot Hugo Bartlicius decided to construct a new splendid pilgrimage compound. For this task he hired a Bohemian architect with Italian ancestors, Jan Blažej Santini-Aichl, who designed the project for a new church. Work started in 1718 with the building of Saint Anne Chapel. The builder was František Benedikt Klíčník from Brno. The chapel was finished and decorated in 1733 and in the same year the statue of Virgin Mary was transported here from the Czech church, which was demolished to make place for a new Baroque church. Work on the church started in 1728, five years after Santini´s death. The builder was Antonín Ritz. The building was finished in 1750, when it was blessed by a new abbot, Kryštof Jiří Matuška, and in the same year the statue of the Virgin Mary was moved back to this church. Santini´s original project was slightly modified. Over the next twenty years decorating work took place in the church. Jan Jiří Etgens is the author of the frescos and Antonín and Ondřej Schweigls are the authors of the statues. The completely finished and decorated church was consecrated on 21st April 1771 by the first bishop of Brno, Matyáš František Chorinský of Ledská.
The monastery in Zábrdovice was abolished by Emperor Josef II in 1784 and Křtiny became state property. It was later sold to secular noble owners. In 1884 the church roofs burned down and they were later reconstructed in a simplified form. Between the years 1864 and 1865 a part of the provostry was rebuilt as a neo-Renaissance château by the owner of the Křtiny manor farm estate. The smaller part, which stayed in its Baroque form, serves up to this day as a parish house. The cloister was demolished by a bomb during the Second World War. However, it was reconstructed early after the war. A major reconstruction of the pilgrimage compound in Křtiny took place between 1975 and 2009.
The pilgrimage compound consists of the central north oriented Church of the Name of the Virgin Mary, which is built on the ground plan in the shape of the Greek cross. The cloister is connected to the church in the east and it is terminated with the tower-like Saint Anne Chapel. This should have had a counterpart in the a never-constructed western Chapel of Saint Joseph, also connected by a cloister. The provostry, currently rebuilt as a château, is situated in a northern direction from the church and in comparison to the original project, was only partially built. The inscribed pentagons play a key role in a draft of a church project. They could refer to the five wounds of Jesus Christ as well as to the symbol of universality. The symbolism of five is complemented by the meaning of other numbers -three, four, and twelve. Some latent "gothisms" are present in the otherwise Baroque church building. As an example, the inner galleries, which follow a type of gallery common in the Gothic cathedrals, could be mentioned. A principal part of the church walls is the abundance of arcades and window openings, which open the wall surfaces and form the wonderful light-transparent character of the walls. The landscape-urbanistic concept of the pilgrimage area is also perfectly mastered. Santini was probably partly inspired by the Immacolata Concezione Church in Turin, designed by Guarino Guarini. The pilgrimage church in Křtiny represents one of the masterpieces of Moravian Baroque architecture.

Fig.39: An aerial view of the pilgrimage Church of the Name of the Virgin Mary in Křtiny.

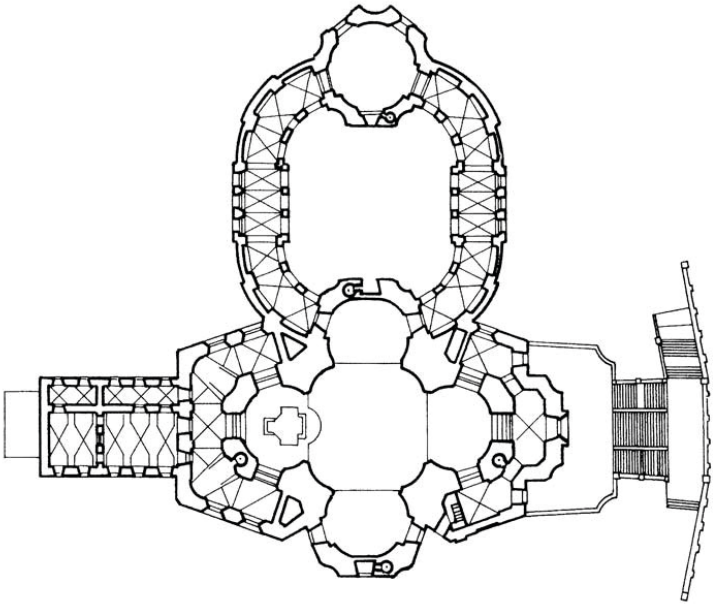

Fig.40: The ground plan of the pilgrimage Church of the Name of the Virgin Mary in Křtiny.

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Palaeolithic settlement of the Říčka Valley

Ondřej Mlejnek, Brno

The subterranean Říčka creek forms an axis of the southern part of the Moravian Karst. Several Palaeolithic sites are situated in its valley (Fig. 41). Pekárna cave served as a central Magdalenian settlement, whereas the Švédův Stůl cave, which has provided Neanderthal bone remains, is a venue of currently ongoing excavational project. There are also many other smaller caves (Kůlnička, Hadí, Křížova, Adlerova, Liščí Díra, Klímova, and Puklinová) located from where other Palaeolithic finds come and it is therefore obvious that these caves also served for a certain time as a refuge of Palaeolithic, mainly Magdalenian, foragers. Apart from these cave sites, several open-air sites have also been recorded (settlement in front of the Ochozská cave or of a site next to a path crossing under the Pekárna cave).

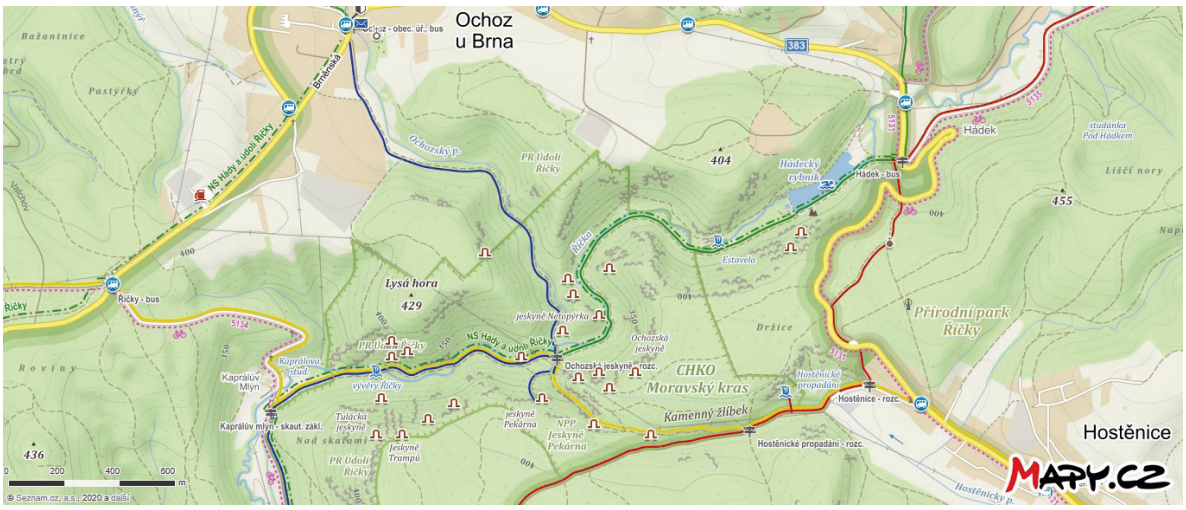

Fig.41: A map of Říčka valley with the location of particular caves.

Most of the local Palaeolithic finds were dated to the Magdalenian period. However, we have also evidence of Neanderthal settlements and perhaps also of the presence of Early Upper Palaeolithic people in the Říčka valley. During the Middle Upper Palaeolithic, people in Central Europe avoided caves and therefore the evidence of presence of Gravettian mammoth hunters in karstic areas is rare.

Švédův stůl Cave

The Švédův stůl (Swedish Table) cave is situated on the right slope of the Říčka valley in the cadastral territory of the village of Ochoz u Brna, at an altitude of 335 metres, approximately 8 metres above the valley bottom. Water flows in a stream bed only during floods, otherwise it disappears underground circa 600 metres upstream into the Hádek swallow hole.

The cave has been well known to the locals since ancient times. Originally it was bigger, but later a large part of a cave ceiling collapsed. This cave, first described by F. Koudelka in 1883, was excavated by M. Kříž between 1886 and 1887. However, the cave was not famous before 1905, when K. Kubasek, a geology student at the Technological University in Brno, found a Neanderthal mandible under a cave chimney. This find was published in 1906 by his professor A. Rzehak (Fig. 42). There were some disputes concerning this find shortly after its discovery. It is not complete, both distal parts as well as the chin are broken off and therefore it was more difficult to distinguish it from an anatomically modern jawbone. However, finally it was determined to be Neanderthal. This find provoked M. Kříž to conduct another excavation here in 1908, but he did not find any other human remains. Neither did later another excavator, K. Schirmeisen.

The biggest excavation was conducted here between 1953 and 1955 by B. Klíma within the framework of a project of the Archaeological Institute in Brno. Stratigraphy inside the cave had already been disturbed by previous excavations, however it was preserved at a platform in front of the cave, where it was covered by a heap of dirt soil from the excavation lead by M. Kříž. B. Klíma started by excavating a 12 metres long trench at the platform just in front of the cave entrance (Fig. 43). Some of the biggest lime stone boulders had to be blasted away. Later the works continued by excavating the disturbed sediments in the cave. In some part of the caves all the sediments were disturbed, whereas in other parts, such as near the western cave wall, some layers, probably of lower Würmian age, remained intact. In the southern corridor a pillar of sediments was kept for the future. It also served for a description of the stratigraphy inside the cave. Later it was regrettably destroyed by amateur archaeologists. Most of the excavational works were done quite fast in 1953 without wet-sieving of the sediments.Less time than it deserved was also devoted to documentation. In 1954 the main excavational works were closed up and in 1955 the upper part of the stratigraphic pillar was excavated. During this excavation mainly stratigraphic problems were dealt with. An analysis of the horizontal distribution of finds was not possible because of the disruption to the cave sediments by previous excavations.

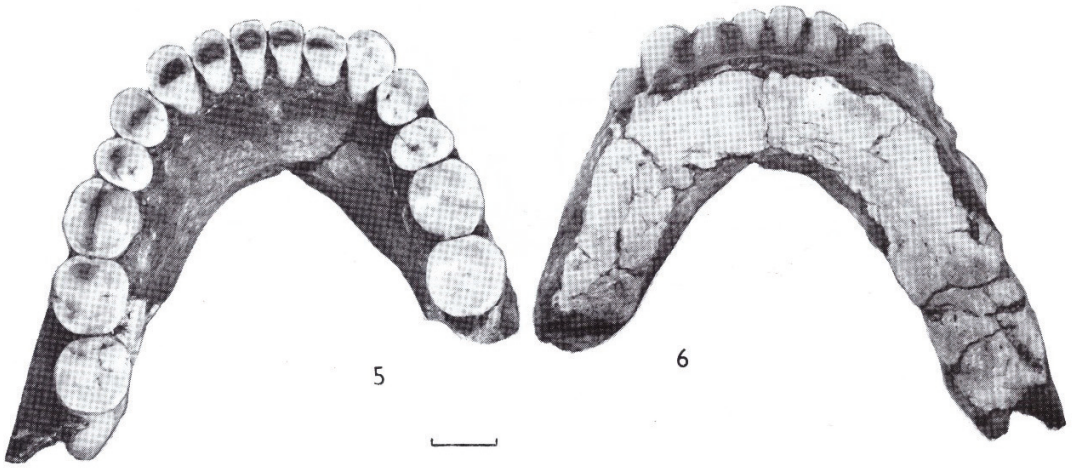

Fig.42: Švéduv Stůl cave. The mandible of a Neandertal man, also known as the Ochoz mandible.

The history of excavations in this cave was followed by J. Vaňura, who shortly after Klíma's excavation excavated crannies in the south-western part of the main hole and under the chimney and later also a narrow corridor leading from the chimney circa 8 metres in the southern direction. At the end of this corridor he found several animal bones and also two tiny fragments of temporal and occipital bones, which should have belonged in his opinion to a Neanderthal man. However, according to current anthropologists they probably come from a cave bear. In the meantime, his daughter managed to find a third human molar on a heap of dirt soil from Klíma's excavation, anatomically exactly the tooth missing in the previously found mandible. However, in the opinion of the anthropologist E. Vlček it belongs to another Neanderthal individual. Between 1965 and 1966 M. Oliva and Z. Krchňák excavated the last intact sediments in a narrow corridor on the left side of the cave entrance. They managed to find several animal bones and teeth and a hyena coprolite. Other animal bones and lithic artefacts have been found, usually after rain, on the heap of dirt soil in front of the cave up to today. Therefore, it was decided to launch a new three-year excavational project, which is described in the abstract of a presentation by O. Mlejnek et al. in this volume.
The cave stratigraphy was described by B. Klíma, who distinguished here layers 1-15. The lowermost layer 15 was present just in front of the cave; it was an ochre soil sediment deposited on the bedrock. It was covered by a complex of brown soils (layers 13-11). In the upper part of this soil complex several Middle Palaeolithic artefacts were found. This was covered by Upper Würmian loess (layers 9-6) with Upper Palaeolithic, mainly Magdalenian, finds. Palaeolithic layers are overlaid with a calcium carbonate layer 5, which is covered by a complex of Holocene soils (layers 4-1). In the central part of the cave the stratigraphy becomes more complicated and there are more horizons of gelifluction and debris inserted. In the lower part of the brown soil complex (layers 13 and 14) several unconvincing limestone artefacts and two quartzite flakes were found. These could be evidence of the earliest Neanderthal settlement of the cave and is dated back to 80,000 years BP. The main Middle Palaeolithic finding horizon was situated in geological layer 11, which consisted of a dark-brown soil. Only seven artefacts were found directly *in situ* in this layer, however, together with several other lithics found in secondary positions, this is clear evidence of a late Mousterian settlement, which can be dated back to a period of circa 50,000 years BP. According to Klíma's observations, a hearth was also found in the same horizon as the lithics. The mandible find could be perhaps also connected to this settlement episode. However, it could have been also brought to the cave by hyenas. A total of 33 artefacts could be connected with the Mousterian settlement, specifically six cores, four flakes, six fragments of hammerstones, and ten tools (Fig. 44). The tool assemblage consisted of several side scrapers, a fragment of

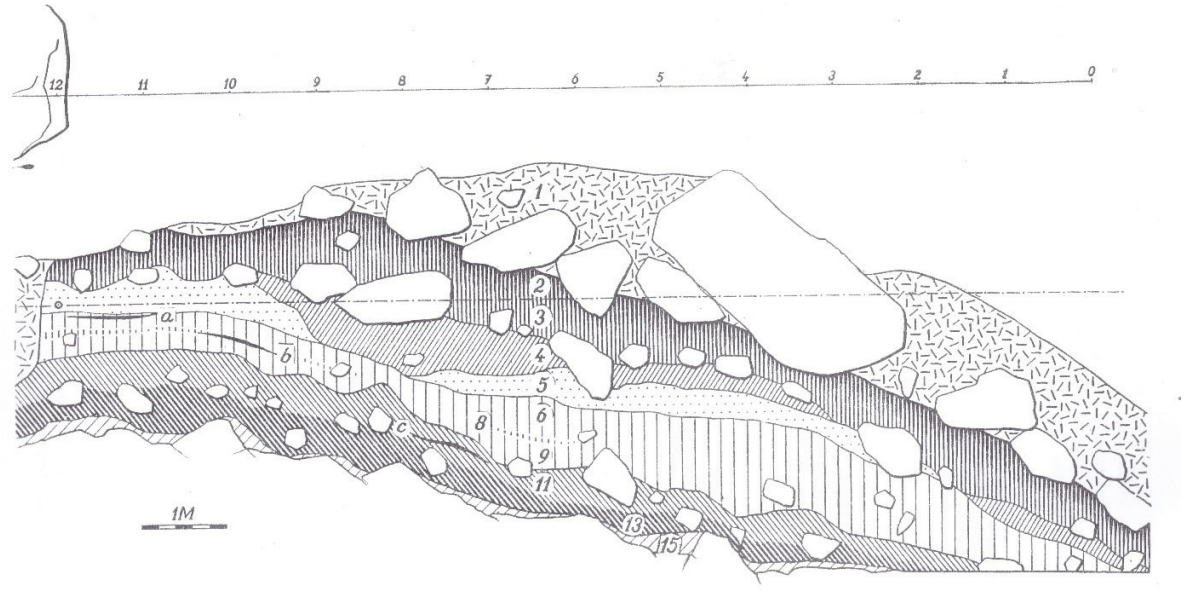

Fig.43: A longitudinal stratigraphic section in front of Švédův Stůl cave documented by B. Klíma with a depiction of particular geological layers (1-15) and horizons with Palaeolithic finds (a – Magdalenian, b -possibly Aurignacian, c – Mousterian).

a tool with a flat retouch, and a roughly retouched high end scraper. The raw material spectrum is composed of Moravian Jurassic chert, quartz, quartzite, spongolite, and Olomučany type chert. All the raw material is obtainable within 10 kilometres of the cave. According to the raw materials spectrum, the mobility of the Neanderthals from Švédův Stůl cave was not particularly high and could be compared, for example, to the Micoquien layer 7c in the Kůlna cave. Animal bones found in the Middle Palaeolithic layers of Švédův Stůl cave were analysed by R. Musil. According to the typical traces of gnawing found on several bones, the cave must have served for a certain time as a hyena den. Numerous animal bones could have been brought to the cave not just by the Neanderthals but also by hyenas or other predators. Therefore, the faunal spectrum reflects a variety of animal species living in the southern part of the Moravian Karst during the first half of the Würmian Ice Age rather than hunting strategy of the local Neanderthals.
Švedův Stůl cave can be generally described as a rich palaeontological site documenting the evolution of fauna in the last Glacial thanks to the existence of a hyena den, and also as an important archaeological and paleoanthropological site thanks to the short-term presence of a Neanderthal group, which left here remains of a hearth, several stone artefacts, and also the unique find of a human mandible. This cave was also later visited by people of the Magdalenian and other Holocene cultures.

Platform in front of Ochozská Cave

In 1938-1939, at a platform in front of the Ochozská Cave, K. Valoch, H. Walloch, and V. Gebauaer discovered a Magdalenian open-air site. A new excavation was carried out in 1953 by B. Klíma. Magdalenian artefacts were documented probably in a secondary position in a brown soil above a loess, which in some places reached the surface. The lithic assemblage consisted of several end scrapers made on narrow blades, burins, fine borers, backed bladelets, and splintered pieces. Less numerous rectangular retouched bladelets, transversally truncated bladelets, and microlithic saws form a distinct part of a tool collection. Personal adornments such as engraved slate pebbles and a fragment of a pierced rondelle made of jet are the most interesting finds from this site. The faunal remains assemblage was dominated by a horse.

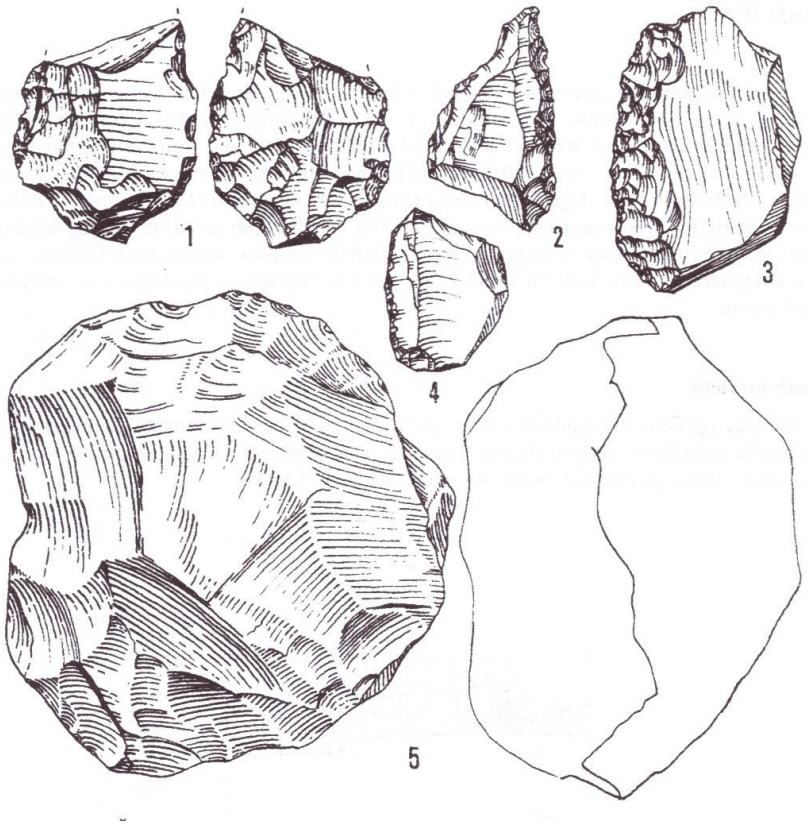

Fig.44: Švédův Stůl cave. Selected Middle Palaeolithic artefacts.

Pekárna Cave and its surrounding

Pekárna (Bakery) cave is the most important Palaeolithic site in the Říčka valley. It is located in the cadastral territory of Mokrá u Brna on the left slope at an altitude 361 metres, circa 40 metres above the bottom of the valley. It attracts our attention by its dominant 6 metres high oven-shaped entrance, which gives the cave its name. It is 23 metres wide and 64 metres long and terminated by a roof fall, which perhaps hides an unknown continuation of the cave.
The beginning of the scientific research in this cave dates back to the second half of the nineteenth century, when it was excavated by the lawyer and amateur archaeologist M. Kříž. However, he was too professionally occupied to be able to personally supervise the excavation, therefore it seems that the workers overestimated the volume of excavated sediment. According to M. Kříž they should have excavated four trenches, eight ditches, and three surface areas. However, it is not sure if this was really done. In his archaeological-linguistic book titled "Kůlna and Kostelík", M. Kříž proclaimed this cave as exploited, which was not the case, as was demonstrated by the results of later excavations.

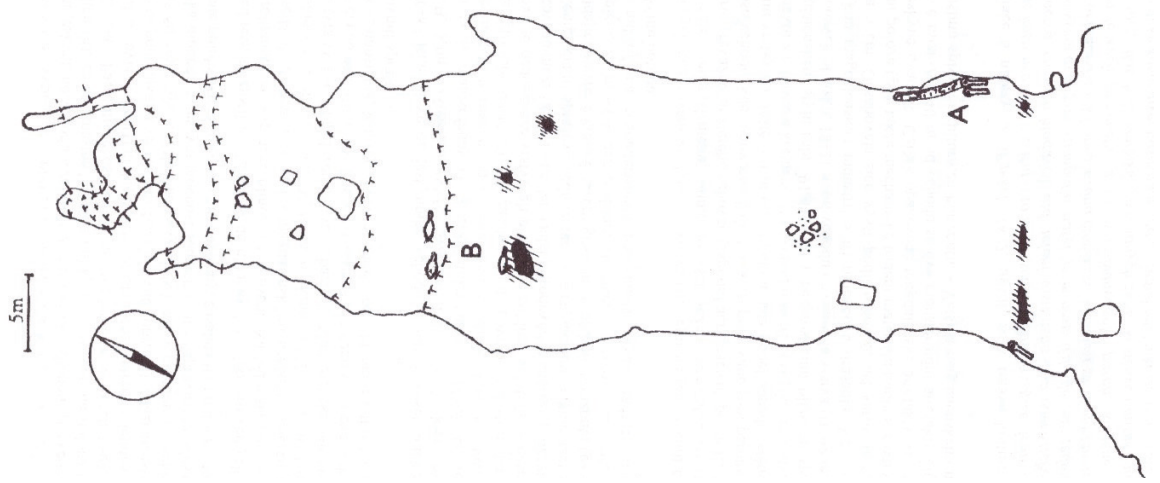

Fig.45: Pekárna Cave. A reconstruction of the finding situation according to J. Svoboda with marking of the locations of hearths and bone tools concentrations A (a rib with a drawing of fighting bisons and perforated batons) and B (decorated spatulas).

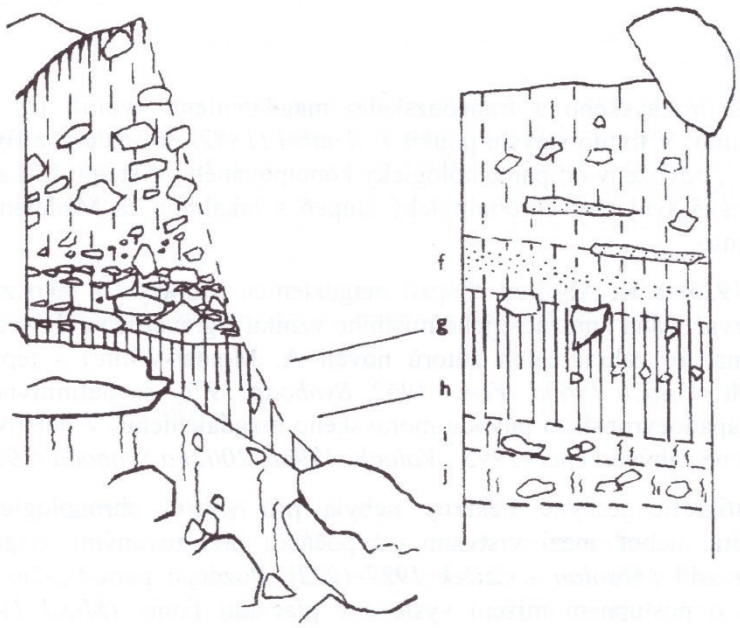

Fig.46: Stratigraphy in the Pekárna Cave. Left picture: The profile in front of the cave (1986-1987 excavation). Right picture: The profile inside the cave (1925-1930 excavation). As per J. Svoboda and K. Absolon.

The next major excavation in Pekárna Cave was conducted by K. Absolon and R. Czižek between 1925 and 1930. Among their interesting findings it is possible to mention, for example, a collection of Magdalenian spear points made of reindeer antler, perforated batons (a Magdalenian tool made of reindeer antler used probably for spear straightening) decorated by engravings, antler harpoons, a female figurine of the Gönnersdorf type, and especially a horse rib with an engraving of fighting bisons. The stratigraphy in Pekárna Cave was later proclaimed by K. Absolon as "classical" and typical for all Moravian sites, which was not correct. The archaeological excavation lead by K. Absolon and R. Czížek in the Pekárna cave between 1925 and 1930 belongs among the most successful archaeological works ever conducted in Moravia. Other important excavations in this area were carried out by B. Klíma. Between 1949 and 1950 he excavated the Křížova cave, which is situated on the opposite slope of Pekárna Cave. There, he found a Magdalenian layer in the upper part of loess which contained stone artefacts, a piece of perforated reindeer antler, and fragments of cut antler. In 1951 B. Klíma moved to the nearby Adlerova cave, where he found several Magdalenian lithic artefacts in a loess layer with two charcoal horizons. Apart from the lithics, he also discovered a Magdalenian spear point, the pierced shell of a Tertiary mollusc, and a perforated animal tooth.

B. Klíma also excavated the platform in front of Pekárna Cave between 1954 and 1964. The most important find of his excavations was made in 1963, when he found a horse rib with an engraving of a scene depicting a herd of grazing horses. It was deposited next to a hearth near the western margin of the platform.

Based on the notes written by R. Czížek, J. Svoboda attempted to reconstruct a simplified finding situation in the cave (Fig. 45). According to this reconstruction a line of hearths was situated near the cave entrance and another line was located in the rear part of the cave. In between these two hearth lines, there should have been several sitting boulders situated in the central part of the cave. These could have served as a workshop for lithic industry manufacturing.

The stratigraphic situation in Pekárna Cave, described by K. Absolon and R. Czížek was later confirmed by the excavations of B. Klíma and J. Svoboda (Fig. 46). The base of the section was formed by greywacke containing yellow sand (layer j), covered by pale yellow loessic sediment (layer i), pale brown soil (layer h), and charcoal containing dark soil (layer g). A calcium carbonate horizon (layer f) separated the Pleistocene sediments from the overlying Holocene layers a-e. Sediments reached their greatest thickness at the entrance bank. In the direction to the rear part of the cave their thickness decreased to just a few centimetres. Abundant Magdalenian artefacts were deposited in layers g and h and also in the upper part of layer i. Several chert archaic tools, possibly from the Middle Palaeolithic age (Micoquian), were found in the lower part of layer i. The cave was later frequently visited by people during the Holocene, as is witnessed by numerous artefacts found in layers a-e.

Pekárna Cave has provided the richest finding collections of the Moravian Magdalenian. In the first place it is especially abundant in knapped stone artefacts (Fig. 47), made mainly of imported materials such as erratic flint, Polish silicites, radiolarite, and rock crystal. However, semi-local raw materials were also used (for example Moravian Jurassic chert, Krumlovský les type chert, Olomučany type chert, or Cretaceous spongolite). It was not possible to find any differences among the Magdalenian layers. Common types of end scrapers and burins are abundant in the assemblage; however, Lacan type burins are missing. Borers (piercers, awls, drills), including several fine specimens, are also well represented. Backed bladelets are sometimes transversally truncated, which creates typical rectangular backed bladelets. Points of the Federmesser type (quill knives) are rare. Typical Magdalenian spear points with a blood groove and obliquely cut base are an abundant tool type among the bone and antler industry (Fig. 48). Middle parts of the spears and antler harpoons are less common. Awls and pierced needles are also common. Antler objects called perforated batons probably served for spear straightening. Some of them are decorated by engravings depicting zoomorphic, sexual, or abstract motifs.

Pekárna Cave has also provided a unique collection of Magdalenian art (Fig. 49). Two horse ribs with engravings of fighting bisons and grazing horses are special pieces renowned worldwide. Another group of engravings is located on the perforated batons. A stylized carving of a female figurine of the Gönnersdorf type made of mammoth ivory is another precious find. A similar kind of stylisation of a woman's body appears as an engraving on one of the slate slabs. The artistic collection from Pekárna Cave is completed by abstract engraved ornaments on bone and antler tools and weapons and also by engravings on slate pebbles.

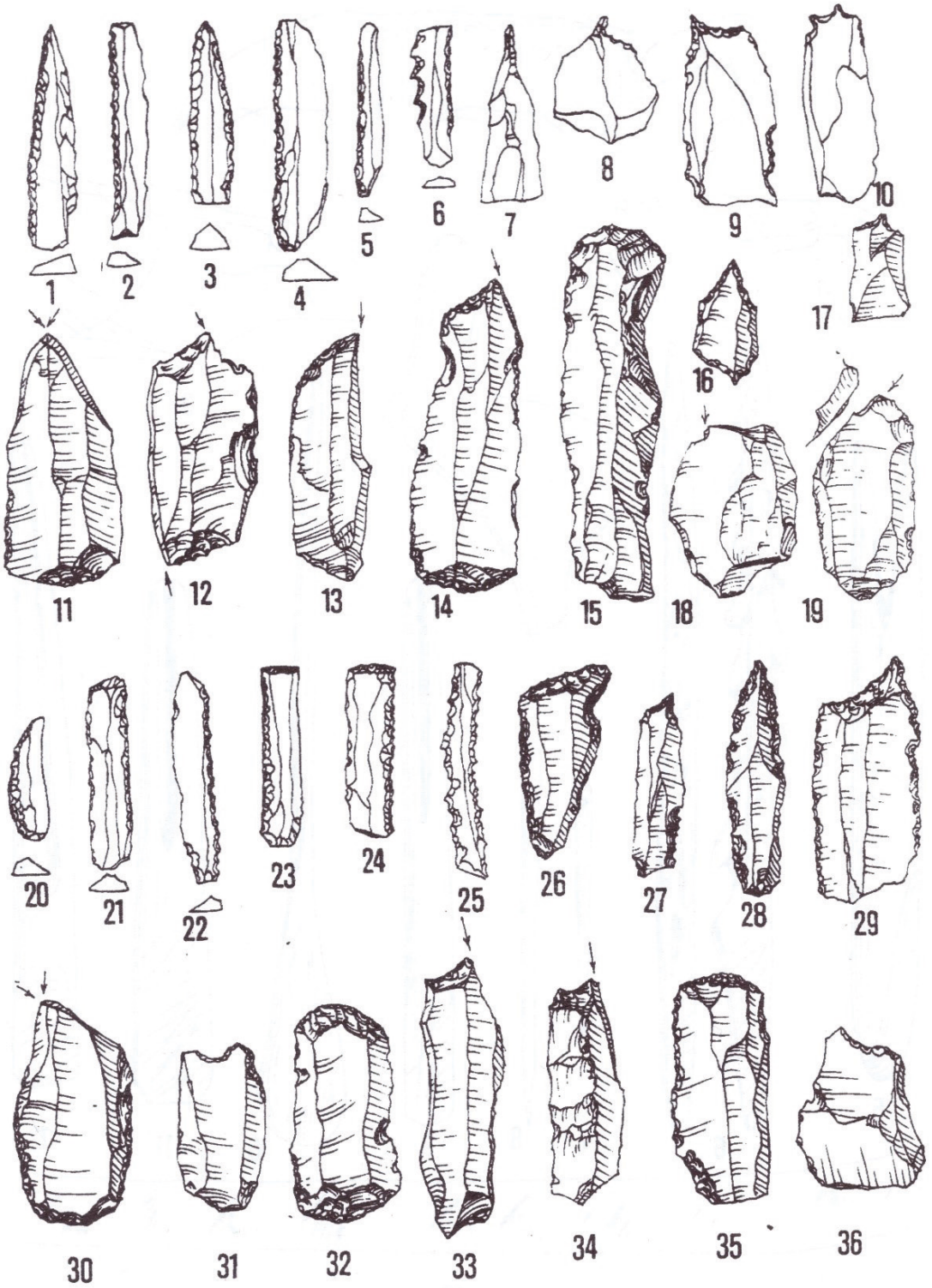

Fig.47: Pekárna Cave. Selected Magdalenian stone tools. 1-19 layers g and h, 20-36-layer i.

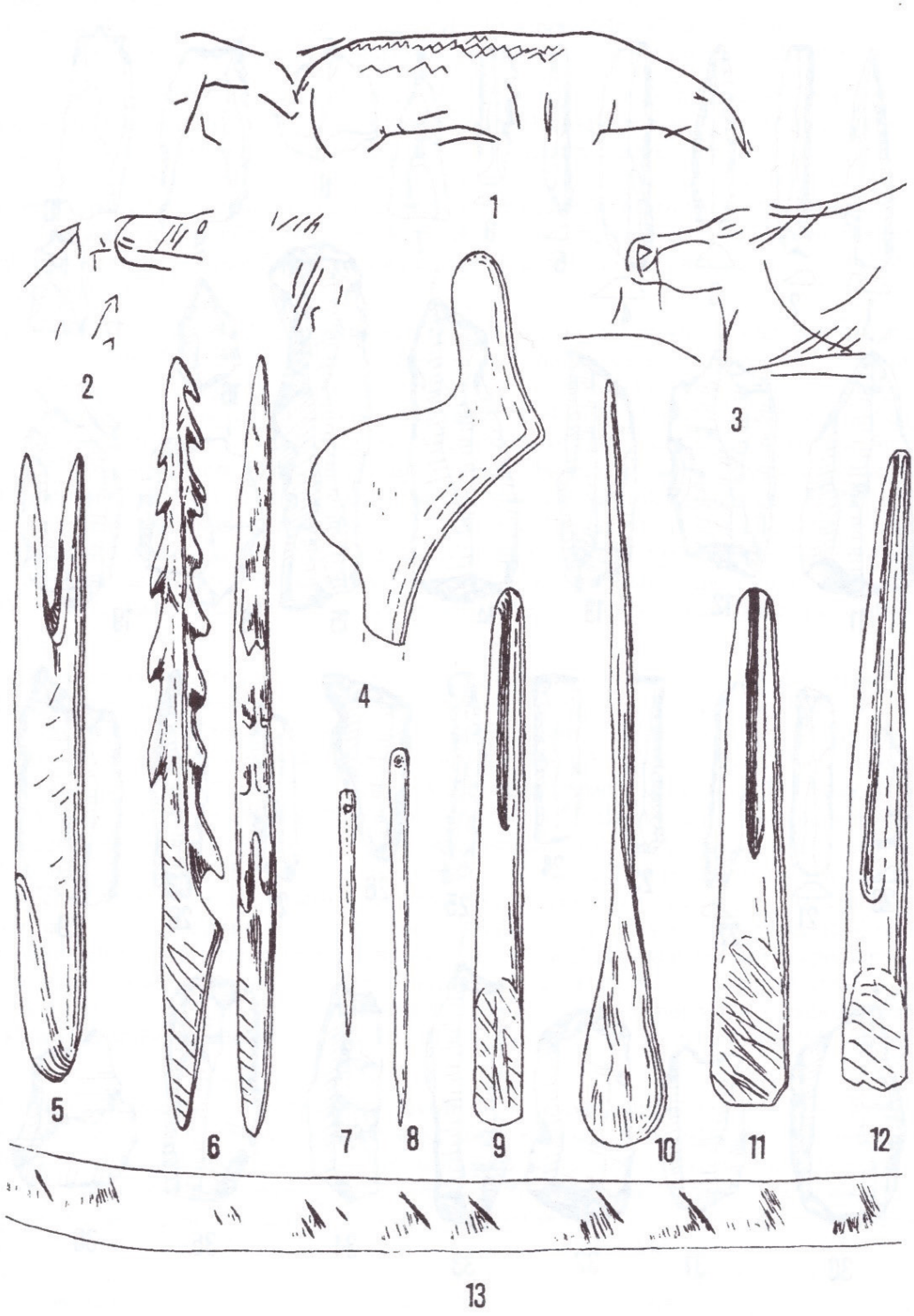

Fig.48: kárna Cave. Selected bone and antler artefacts.

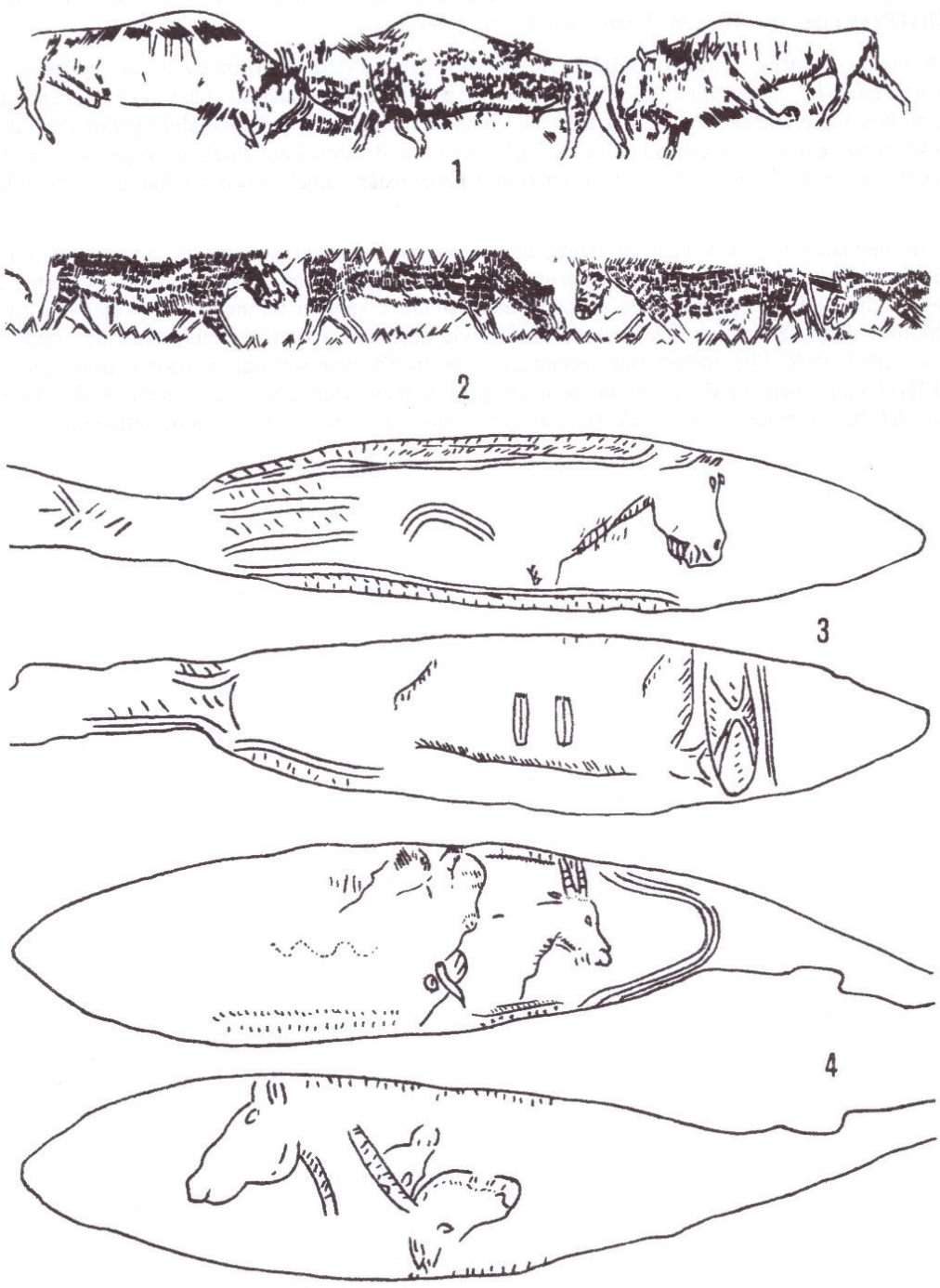

Fig.49: Pekárna Cave. Magdalenian art. 1 – engraving of fighting bisons, 2 – engraving of grazing horses, 3-4 – spatulas made of horse mandibles decorated by engravings.

Faunal remains were analysed by R. Musil. While hare (37%) and reindeer (28%) bones prevailed over bones of hoses (19%), birds (9%) and arctic foxes (4%) in the cave, in front of the cave horse bones prevailed over reindeer bones. This could have been affected by settlement seasonality, when the platform in front of the cave could have been used by the Magdalenian hunters more in the summer, while the inner part of the cave could have been inhabited more in winter.

The distinct majority of the Palaeolithic finds from the Pekárna cave belong to the Late Magdalenian culture, as is supported by radiocarbon dating, which dates the local Magdalenian settlement to the Late Glacial interstadial Bølling (14,700-14,100 BP cal).

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Excursion B

The Dolní Věstonice – Pavlov – Milovice settlement area: a unique Pavlovian puzzle piece in the Gravettian mosaic

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The Pavlovian, as the specific Gravettian development on the territory of Moravia and in the surrounding areas between around 30 - 25 kyr BP, represents a one of the most complex hunter-gatherer adaptations to Ice Age (Svoboda, 2007). The adaptation of the migrant groups of the anatomically modern human to the new environment and the ongoing climate change has enabled the emergence of an advanced, comprehensive hunter-gatherer society, manifested by an organized settlement strategy, a developed system of natural resource exploitation or by the occurrence of new technologies, such as a production of ceramics and textiles (Svoboda et al., 2000).
The lifestyles of the Pavlovians were reflected in the strategies oriented on hunting of large herbivore herds, seasonally migrated in the natural geomorphological corridor between the Lower Austria, Moravia and Southern Poland. The Pavlovian settlement system is divided thus into the several main settlement clusters (usually located in regular intervals between 80-120 km), situated in the strategically advantageous locations near the natural geomorphological gates, and usually at the slopes above the wide river valleys (Wachau gate, Pavlov hills, Moravian gate, middle course of the Morava River, the Váh valley area, Krakow area).
The unique cluster of the Pavlovian sites, lying below the Pavlov hills (the Dolní Věstonice – Pavlov – Milovice settlement area), represents one of the most important areas with Gravettian occupation on the Moravia territory (Svoboda, 2016). A unique and hierarchically structured complex of hunter´s settlements, oriented on mammoth hunting, provides the evidence of dwelling structures associated with the activity zones of stone and hard animal tissues tools production, art and decorative artefacts, hunting and butchering activities and finally the human burials. All these aspects reflect the intensive settlement, nourishment, symbolic and ritual behaviour.
Altogether 13 sites (DV I-III, P I-VI and M I-IV) form a continuous chain along the northern and north-eastern slopes of the Pavlov Hills (Fig. 50), from eastern part of village Dolní Věstonice and continue towards to the east through village Pavlov to the village Milovice. Most of them are situated on the mild slopes at the same sea-level elevation (about 200 m) and 30-40 m above bottom of the valley. The settlements are of various size and complexity, in the terms of the documented activities and archaeological records - from the most complex sites, characterized by semi-permanent or repeated occupation with dense archaeological accumulations to the small, one settlement unit's sites or spots known only from surface collections.

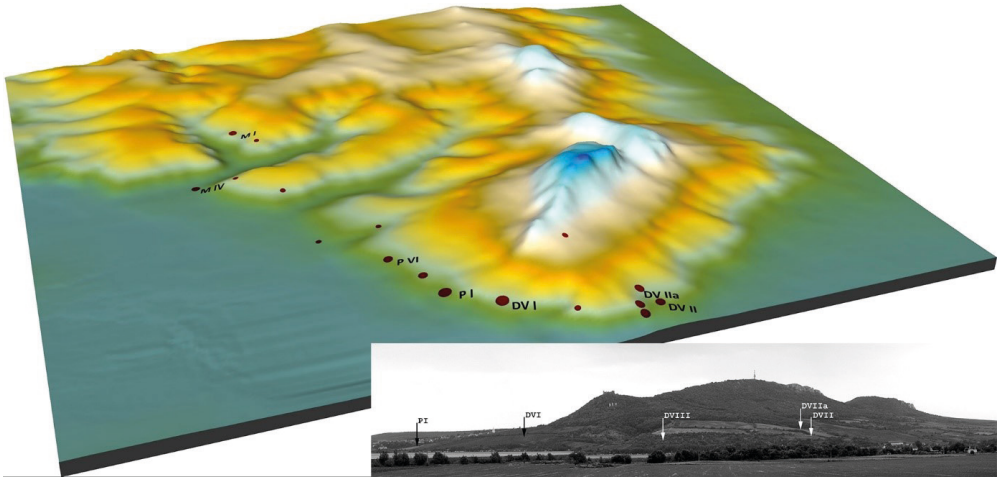

Fig.50: The Dolní Věstonice – Pavlov – Milovice settlement area. 3D reconstruction and photo of the Pavlov Hills showing the location of the sites.

Fig.51: ArcheoPark Pavlov. Unique architecture of the museum based directly at the site of Pavlov I. Photo by G. Dvořák.

The systematic investigation of the area, including field excavations and material inventorying followed by analytical research in laboratories, has been developed for almost 100 years by several generations of archaeologist as Karel Absolon, Assien Bohmers, Bohuslav Klíma, Martin Oliva and Jiří Svoboda, and nowadays presents a primary role of the Center for Paleolithic and Paleoanthropology in Dolní Věstonice. The research results and history are being now presented on the level of popularization to broader audience through the Archaeological Park Pavlov (Fig. 51). A unique modern museum and exhibition hidden under the ground directly at the site of Pavlov I. The stunning museum presentation and mainly the singularly impressive building's architecture were awarded by the several prestigious architecture and museum prizes – e.g. Gloria musaealis Award, Building of the Year Award for 2016, Iconic Awards 2017, CEMEX Building Award 2017, The Czech Architecture Award 2017, and BIGSEE Architecture Award 2019.
The traditional museum exposition, combined with contemporary audio-visual technology, presents the daily life of mammoth hunters, the artefacts they used, as well as the new technologies employed perhaps for the first time ever. A replica of the Dolní Věstonice tripleburial confronts the visitors with the burial rites of Pavlovians, while their aesthetic sensibility and symbolic behaviour is conveyed by the pieces of art, including zoomorphic and anthropomorphic figurines and carvings, or decorative objects. One of the exhibition's unique features is the presentation of mammoth bones deposit, which remains in situ after being excavated.
The importance of the whole area is declared also by the fact that archaeological key zones (namely Pavlov I, Dolní Věstonice I and Dolní Věstonice II) are now protected by the Antiquities Law and hold the status of National Cultural Monument.

The Dolní Věstonice I Site

The site represents a structured complex of settlements, extended on a long, northern slope above a Dyje river valley (Fig. 52), in the past, obliquely intersected by a deep hollow way, along where the first excavations were realized. Dense settlements concentration, presence of ritual burials, evidence of the new technologies as well as the abundance of art and decorative objects make the DV I site one of the most significant settlement and cultural centres of Europe during the Gravettian (Svoboda, 2016).
Within the whole settlement area, the site has the longest excavation history, with several breaks from 1924 to 1993, and with several institutions exchanged in leading over the period. Systematic large-scale excavations in the most promising parts were carried out between 1924-1952 by K. Absolon, A. Bohmers and B. Klíma (e.g. Absolon, 1938, Bohmers, 1941, Klíma, 1963, Eickhoff, 2013, Oliva, 2014, Svoboda, 2016). The last fieldworks in 1990 and 1993, conducted by J. Svoboda and held as a series of trenches along the site boundaries, were concerned the overall chronostratigraphic and archaeological situation of the site (Svoboda et al., 2018).
The site area is divided into four main parts (lower, middle, upper and uppermost), where several independent settlement concentrations were unearthed. The most important units were concentrated in the middle and the upper part of the site, where the remains of

dwellings (Fig. 53a), hearths and ash layers, accompanied by lithic tools, worked bone, antler and ivory artifacts, symbolic objects as well as faunal remains, created an extraordinary and rich archaeological deposit. Chronological position of the obtained C14 dates corresponds to the Early and Evolved Gravettian and places the main occupation period here between 31 and 29 kyr cal BP (Svoboda et al., 2018).
In 1949, B. Klíma discovered a ritual burial of a gracile, 36-45-year-old women (DV 3; Trinkaus, Svoboda eds., 2006). A complete skeleton was buried under two mammoth scapulas in a strongly crouched position, lying on its right side and covered with red ochre (Fig. 53b). A skull, recently virtually analysed together with a facial reconstruction (Nerudová et al,. 2019), confirm extensive pathological damage with significant asymmetry of the facial area as a result of a traumatic injury in childhood. Other anthropological finds include two fragments of adult calvarias, previously interpreted as cups (DV 1, DV 2), remains of a partially burned child's burial (DV 4), and others isolated human bones and teeth (Trinkaus, Svoboda eds., 2006).

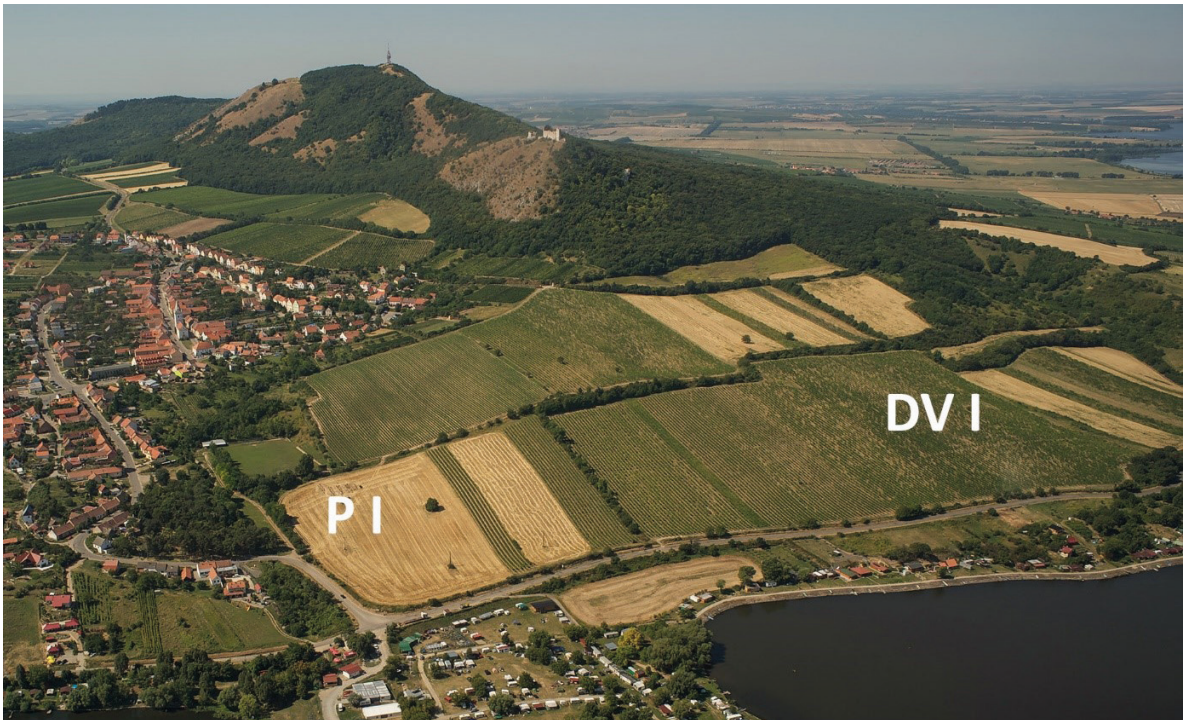

Fig.52: Aerial view showing the location of the sites DV I and P I. Photo by P. Pokorný.

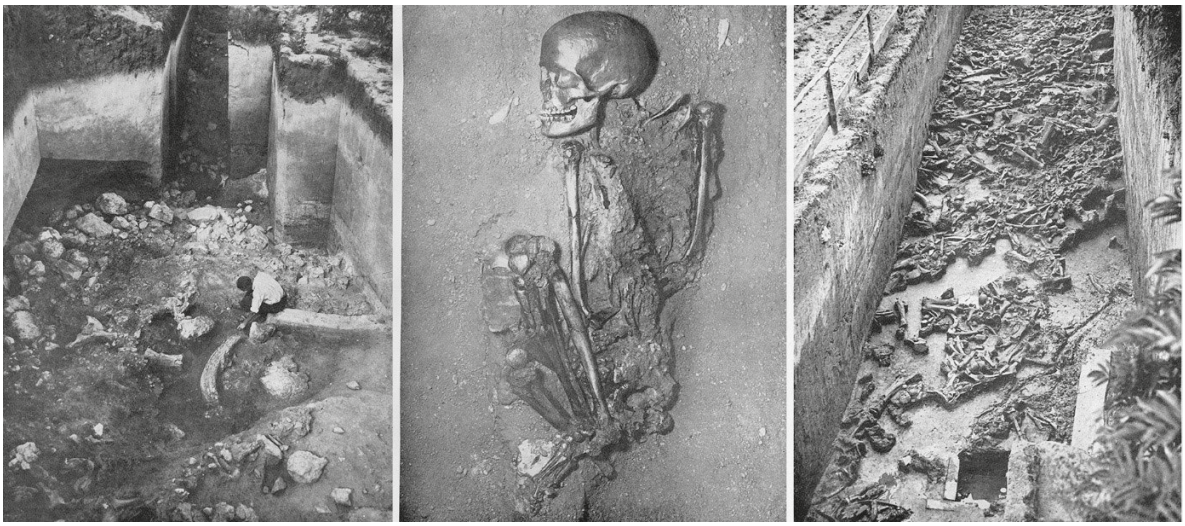

Fig.53: Dolní Věstonice I. Excavation by B. Klíma; from the left: a) the settlement unit with circular structure and central hearth; b) the ritual burial of a women (DV 3); c) the large deposit of mammoth bones (photos from Klíma 1963).

Fig.54: Dolní Věstonice I. Pieces of art: a) Venus of Věstonice from baked clay; b) portrait of a woman carved in ivory. Photos by M. Frouz.

Along a border of the upper part, there was a shallow, flooded terrain depression with an extensive mammoth bone deposit (Fig. 53c), accumulated in an area around 45 × 12 m, and containing an exceptional number of freely scattered remains from dozens of individuals (Wilczyński et al., 2015). In addition, bones and teeth of horses, reindeers, wolves, foxes, wolverines or hares were also discovered.

Among the collections, the most exceptional are the pieces of art, including assemblage of human and animal figurines from burned clay, mammoth-ivory carvings, and series of decorative objects (Svoboda 2016). The well-known and iconic "Black" Venus of Dolní Věstonice (Fig. 54a), with a human fingerprint described on its back, and a small portrait of a woman carved in mammoth ivory (Fig. 54b), probably representing a real person, represents some of the master pieces in Czech Pleistocene art collection. The baked clay pellets were usually distributed in/or around some of the hearths together with the figurines or their fragments and represent the world earliest known evidence of ceramics (Vandiver et al., 1989).

The Dolní Věstonice II Site

The Dolní Věstonice II site (Svoboda ed., 2016) represents a spatially structured complex of Gravettian settlements, lying on the eastern edge of the village. It occupies one of the loess elevations at the Pavlov Hills foot, which rises above the Dyje River. The campsite stretches over a large area (Fig. 55), from the former brickyard at its base ("Calendar of the Ages"), through the nowday artificially terraced terrain of the top and the western slope up to the vineyard below the forest (Sub-Site IIa). Along the western edge of the settlement again a mammoth bone deposit, evidently coincided with the main occupation of the site, was accumulated in an adjacent side gully, where an earlier a Pleistocene landslide temporarily created a shallow flooded basin (Svoboda et al., 2019).

The first archaeological survey at the site was carried out by E. Dania already during the 1930s in the uppermost part, followed by later fieldworks, led by B. Klíma in 1950s, were focused on the examination of the loess section in the brickyard in the lower part. The central parts of the site (Site-top, Northern and Western slope) were excavated by B. Klíma and J. Svoboda between 1985 and 1989, as the large-scale rescue excavations during the construction of the Nové Mlýny reservoirs (Klíma, 1995, Svoboda, ed., 1991). Additional smaller excavations, situated mostly in the peripheral parts of the site, took place in 1991, 1999, 2005 and 2012 (Svoboda ed., 2016).

The occupation of the site has been dated by a large series of C14 dates, coming from samples taken from all parts of the site. They range in a broader time-span between 36 and 27,5 kyr cal BP, however, most of them (from the Site-top, Western slope and Southern edge) are associated with Evolved Gravettian, creating a homogeneous cluster between

32-30 ky cal BP (Svoboda ed., 2016). If compared to the DV I and P I sites, the occupied area was of considerably larger extension, although traces of the settlement was more scattered and not as intense over the area, and thus resulted from multiple, repeated short-term occupations. The findings of art and decorative pieces are less common here, however, particularly interesting are evidences of fur-processing activities on the site. They are documented by the number of remains after fur-bearing animals, especially foxes and wolves, as well as the occurrence of bone tools, blunted spears or stone artefacts with traces of work with fur. One of the hearths provided also the first known direct evidence of the plant-based food preparation (Mason et al., 1994).
The most unique aspect of the site is the discovery of several ritually buried skeletons (Trinkaus, Svoboda eds., 2006), on which the complete genetic analysis was also carried out (Mittnik et al., 2016) - a well-known tripleburial of three young males (DV 13, DV 14 and DV 15), found in 1986 (Fig. 56a), and the burial of man (DV 16), lying in a crouched position, unearthed in 1987 (Fig. 56b). Along with the DV 3 and Pav 1 burials and other isolated human bones and teeth, they represent the most comprehensive skeletal collection of early anatomically modern humans on a global scale.

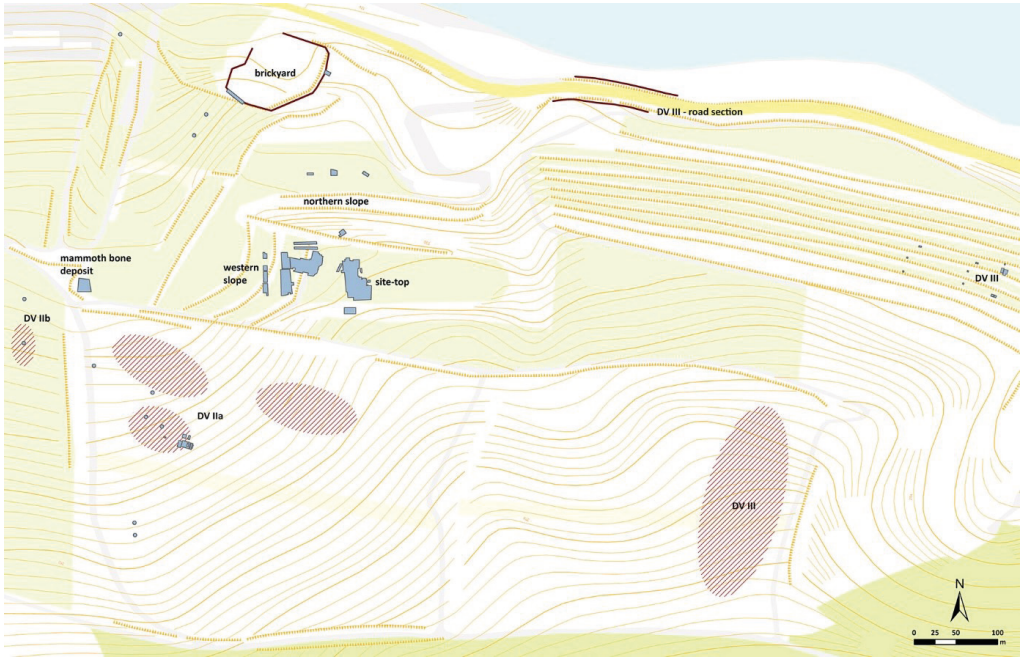

Fig.55: The map showing the location of the sites DV II and DV III (Svoboda ed. 2016).

Fig.56: Dolní Věstonice II. Ritual burials discovered at the site; a) the tripleburial of three young males (DV 13, DV 14, DV 15); b) the burial of man (DV 16), lying close to a hearth and probably inside a dwelling. Photos by J. Svoboda.

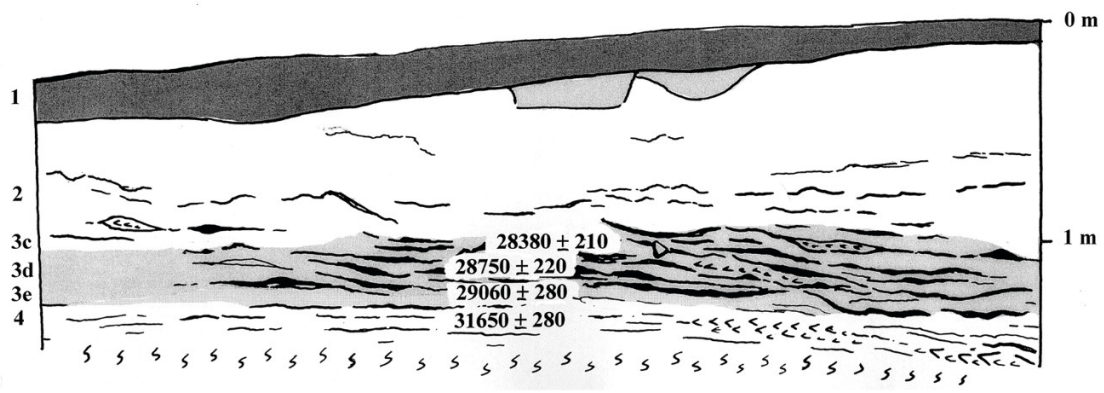

Fig.57: Dolní Věstonice IIa. Stratigraphic section through the hearth with a sequence of AMS dates (Svoboda et al. 2015).

The Dolní Věstonice IIa Sub-Site

The last fieldwork at the DV II site took place in 2012, at the southern, uppermost part - in a separate area of sub-site DV IIa "Pod lesem" (Svoboda et al., 2015), where Gravettian layers were deposited in a shallow position and therefore were continually disturbed by ploughing. An interdisciplinary research uncovered on the area of 5 × 9 m of an intact cultural layer with a complex multilayer hearth, with a diameter 110-120 cm and thickness of 25-30 cm, surrounded by a relatively compact horizontal cluster of finds. The hearth was finely stratified into several microlayers, which provided a sequence of AMS dates between 36 and 31,5 kyr cal BP and evidently displayed several and repeated usage of the same place within the long periods (Fig. 57). The provided assemblage consists of animal bones and teeth, lithic artifacts, mineral dyes and a few fragments of burnt clay pellets, declaring again the earliest evidence of the ceramic production in the DV-P-M settlement area. The lithic industry possesses typologically and morphological character of Gravettian period, however any precisely chrono-typological classification cannot be estimated.

The associated environmental evidence of charcoal, pollen and molluscs completes the picture of MIS 3 landscape and shows that climatic development was relatively stable, but with a certain variability in moisture and forest extensions.

The Dolní Věstonice II – Southern edge

The Southern Edge of the DV II site is located at the upper part of the site and situated close to the area where the triple burial was discovered. The area was firstly uncovered in 1991 due to the excursion presentation for the UISPP congress. Later, in 2005, it was completely and systematically excavated within the interdisciplinary frame of the paleoenvironmental research project (Svoboda ed., 2016).

The excavation, carried out across an area of about 40 m^2, uncovered the part of the settlement unit (S7) with an oval-shaped hearth (about 120 × 80 cm), accompanied by additional charcoal lenses throughout the area. Associated accumulations of lithics (belong to evolved Gravettian) and faunal remains (dominated by reindeer) were distributed in a single stratigraphic sequence and created irregular, discontinuous scattered patterns with several separate concentrations usually following the locations of charcoals lenses. Paleobotanical analysis from plant macro-residues and phytoliths documents an environmental and climatic change towards the end of the middle pleniglacial during MIS3 (Beresford-Jones et al., 2011). The area is interpreted as a short-term, open non-residential settlement unit, where prevail the activities associated with a lithic blank production around the central hearth. If compared to the functional character of other settlement units at DVII, the contribution here opens the discussion about the variability in spatial utilizations of different parts of the settlement areas, and especially those lying in the peripheral zones.

"Calendar of Ages" Sub-Site

The "Calendar of Ages", is situated on the eastern edge of the Dolní Věstonice village and represents one of the most important geological localities in Southern Moravia. The section in the former brickyard´s of the clay pit have preserved the geological layers from the last

interglacial and glacial period, which encompasses more than 110 thousand years of unstable development of both, nature and climate, during which extremely cold and dry periods were alternated by humid and warmer oscillations.
A complex revision of the loess section was realized in 2010 by the team led by D.D. Rousseau (Antoine et al., 2013). It enables to identify 22 units further divided into four sub-sequences (Fig. 58). At the base of the section, above a belt of brown forest soil from the last interglacial period, a distinct Early Glacial complex of black soils is developed (units 20-11 in subsequence I; OSL dated to ca. 110 to 70 kyr; MIS 5) and corresponding to warmer oscillations during this period. Following Lower Pleniglacial (units 10-7 in subsequence II; ca. 70 to 50 kyr; MIS 4) is characterized by laminated sandy loess and the Middle Pleniglacial (units 6-4 in subsequence III; ca. 55-40 kyr; MIS 3) is represented by a brown soil complex, indicating a series of temporary warmings during the glacial. The Upper Pleniglacial part of the section (units 3-1 in subsequence I; ca. 30-20 kyr; MIS 2) consists of a thick horizon of laminated sandy loess (interstratified by tundra gley layers too), indicating a strong wind activity and intensive dust sedimentation during this period. Preserved layer of the Early Gravettian (around 33 kyr cal BP), associated with a small lithic assemblage, lies at the base of this loess horizon, at a depth of 6m and represents the lowest part of the DV II settlement.

Dolní Věstonice III

The site of DV III (Škrdla et al., 1996) is located on a long steep slope between the sites of DV I and DV II (Fig. 55). It represents a spatially smaller settlement, consisting of a set of freely scattered units, evidently created during the wider time interval/period. The site was firstly discovered by a surface survey, documenting the beginning of the Upper Paleolithic (the Aurignacian, around 40-35 kyr) in its upper part and the Gravettian located down the slope. Such disposition was later registered by rescue excavations of B. Klíma, when the slope was artificially terraced.
Excavations led by J. Svoboda and P. Škrdla in 1993-95 were situated in the lower part of the site and discovered two separate settlement units with a Gravettian character. The C14 dates fall around 33 and 29 kyr cal BP. The cultural layers were strongly affected here by post-depositional processes (gelifluction and slope displacement) and contained remains after damaged hearths, associated faunal remains of prey(a mammoth prevails) and small number of lithic artefacts, including several distinctive points.

The Pavlov I Site

The site of Pavlov I represents one of the three largest and most complex Gravettian settlement agglomerations in Moravia. Together with the DV I site, which is located in its vicinity, ranks among the most important settlements of this period (Svoboda 2016).
The site was extensively excavated by B. Klíma between years 1952 and 1972, as one of the largest and most complex archaeological systematic excavation held by the Institute of Archaeology, of the CAS, Brno. Its generalized picture, as a large mammoth-hunter's campsite, was later built based on the analysis of individual parts in terms of stratigraphy, planigraphy, spatial structure and material culture analyses (Svoboda ed., 1994, 1997, 2005). The construction of the Archeopark Pavlov caused large-scale rescue excavation in years 2013-2015, which enabled site revision again in its spatial organization, microstratigraphy, and effects of natural processes in site formation (Svoboda et al., 2016).
A spatially structured settlement agglomeration stretched over a relatively large area with geomorphologically rugged terrain. The site is situated on a gentle, north-eastern slope (Fig. 52), which slowly descends towards the Nové Mlýny water reservoir (originally the Dyje river bed) and is bordered by a small side valley with an active brook. The originally and transversal east-west oriented small ridge (with an adjacent gully on the north), where a main occupation zone was located, runs beneath the present slope and was most probably preferred due to its drier type of sub-soil formed by redeposited Tertiary flysch and an angular limestone debris.

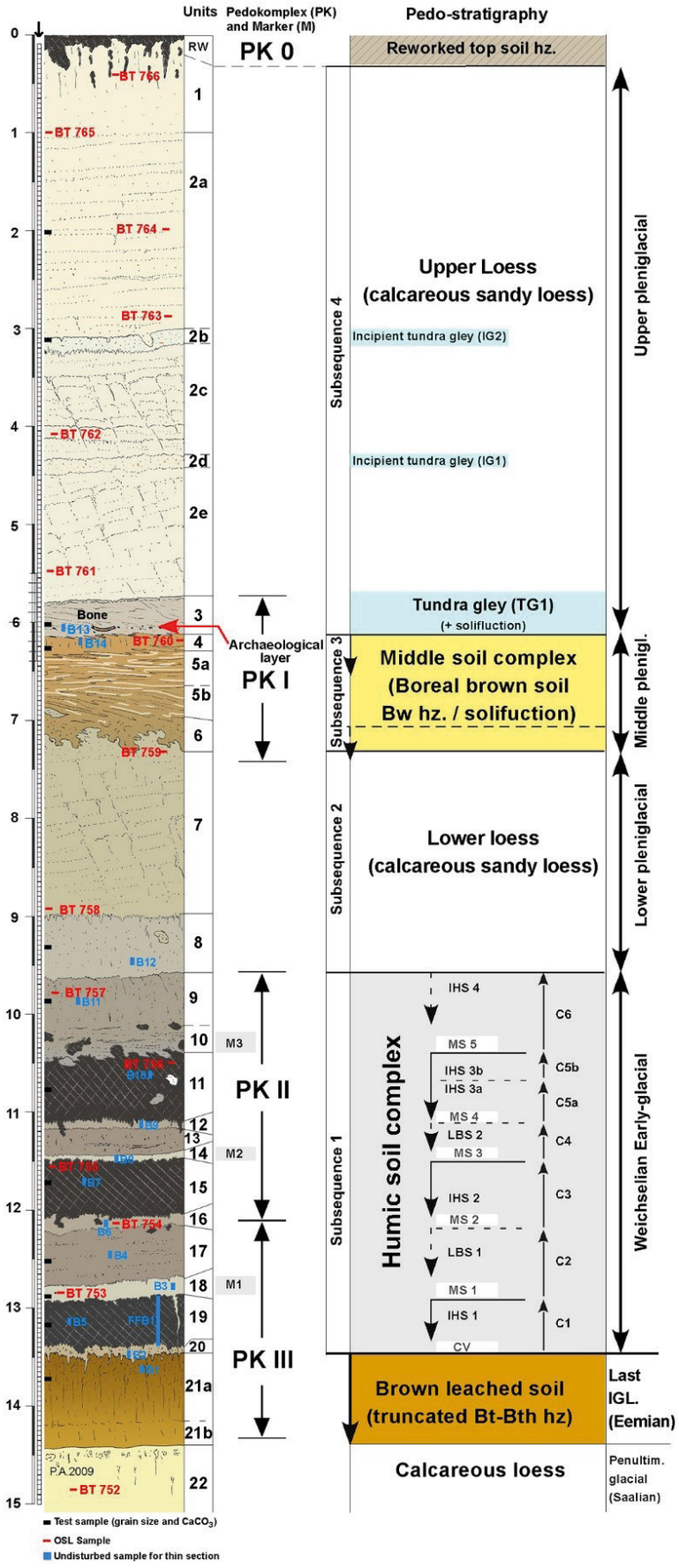

Fig.58: Dolní Věstonice II. Stratigraphic section of the "Calendar of Ages" (Antoine et al. 2013).

The whole settled area consisted of several settlement units interpreted as dwellings, workshops or zones of specialized activities (Fig. 59). They were usually circular or oval structures with a diameter of about 5 m, based in shallow depressions and accompanied by hearths, cooking pits and accumulations of larger stones and bones along their edges. In some cases, these units overlap each other and form the complicated pattern of palimpsest. The finding situation does not allow us yet to tell whether all units coexisted at the same time, when multiple spectra of activities were performed at the same place and during a long time period, or whether they resulted from long-term and repeated occupations.
Intensive settlement activities accumulated here a huge amount of archaeological material, including thousands of lithic artefacts, numerous bone tools, unique decorative and artistic objects, again represented by anthropomorphic and zoomorphic ceramic figurines and ivory carvings (Fig. 60), as well as rich remains after game species (Fig. 61) - not only the bones and teeth after mammoths, reindeers, horses, hares, foxes, wolves and wolverines, but even so after birds, fish, occasionally also after aurochs/bisons, woolly rhinos or other predators, such as lions and bears.
In 1957, a ritual burial of older man (Pav 1) was discovered in the northwest part of the site, lying originally in a crouched position under a mammoth scapula and later disturbed by geological processes (Trinkaus, Svoboda eds., 2006). Unusual anthropological findings are pierced human teeth or separately buried pairs of hands and feet, displaying different manners in dealing with the deceases (Sázelová et al., 2018).

Fig.59: Pavlov I. General plan with settlement units as defined by B. Klíma and J. Svoboda (Svoboda et al. 2016).

Fig.60: Pavlov I. Pieces of art: a) the head of a lion from baked clay; b) the carving of a mammoth in ivory. Photos by M. Frouz.

Fig.61: Pavlov I. Unit S3 with a mammoth tusk and associated faunal remains of reindeer, wolf and fox, accompanied by lithic artefacts. Photo by M. Novák.

The sequence of C14 dates demonstrates the gradual formation of cultural deposits within the wide time-span of 38-29 kyr cal BP, which naturally does not cover just the Evolved Gravettian, but also earlier occupations dated to closely undetermined Upper Paleolithic (Svoboda et al., 2016).

The Pavlov VI Site

The site of Pavlov VI (Svoboda et al., 2009) was discovered in 2007, during the construction activities at the cadastre of Pavlov. The site is located on the eastern edge of the village nearby the road to Milovice. The excavation unearthed an isolated settlement unit (Fig. 62) with a central fire-place or roasting pit (130 × 80 cm and 30-40 cm deep), associated smaller kettle-shaped pits around, and related lithic industry bearing the Gravettian character, three bone artefacts (spatulas) and faunal remains, including remains of two mammoths.
Furthermore, few decorative objects and fragments of clay figurines, were discovered. Similar findings are exceptional for such a small-sized site. Additionally, we should mention of the imprints in burned clay pellets, corresponding to human fingerprints, imprints of a

reindeer hair and textiles, as well as rare evidence of plant consumption, demonstrated by starch grains traces left on one of the grinding stones (Revedin et al., 2010). The site could be interpreted as a short-term, more specialized open-air camp where various activities associated to treatment of the game were performed by Gravettian hunters and belongs thus to the exploitation sites within the Dolní Věstonice – Pavlov – Milovice settlement area (Svoboda ed., 2011).

The Milovice IV Site

The site of Milovice IV (Svoboda et al., 2011) represents evidently a large Gravettian settlement, preserved beneath the present village. The site is situated in a surprisingly lower altitude, at the bottom of a Milovice side-valley. It was discovered very unexpectedly in June 2009, after the road collapse into the old abandoned cellars just below the centre of the village. Technically challenging rescue excavation, in straitened conditions of underground (Fig. 63), was carried out by J. Svoboda in 2009 and 2010, on limited area of ca. 2,5 × 4 m.

Fig.62: Pavlov VI. Isolated settlement unit with a central roasting pit and kettle-shaped pits around. Photo by J. Svoboda.

Fig.63: Milovice IV. A rescue excavation in the abandoned cellars below the centre of the village in 2009, led by J. Svoboda (in the foreground). Photo by M. Frouz.

A thick complex of Gravettian cultural layers (ca. 60-70 cm) runs at a depth of nearly 5 m, with features such as a hearth, small kettle-shaped pits, and a deposit of mammoth tusks. The faunal remains assemblage, characterized by a high fragmentation, is composed predominantly by mammoth, followed by other small to large-sized mammals (reindeer, horses, wolves, foxes and hares). The most characteristic feature is a number of burned fragments, possibly indicating that bones were used as a fuel too. The lithic industry is of typical Gravettian character with the predominance of burins over endscrapers, a high proportion of backed artifacts and relatively high abundance of radiolarite (41%) between raw materials. The finding collection is completed by fragments of ivory points, plaques with traces of ochre grinding, and fragments of mineral dyes. Tertiary mollusc shells and two fox teeth with evidence of partly prepared roots for perforation, probably constitute the decorative objects. The obtained C14 dates between 31 and 28,5 kyr cal BP indicate the site development in parallel with the deposition of large mammoth deposits in the Milovice I site, which is located deeper, in the end of the Milovice side-valley.
The importance of the site is especially in its atypical position. In contrast to other sites in the DV-P-M settlement area, it is not located on the slope, but almost at the level of the past Dyje River floodplain and was evidently positioned to block the entrance to the adjacent Milovice side-valley. This location, allowed direct contact with mammoth herds and offered various possibilities for gathering plants and fishing, which could represents a new aspect of organized settlement and subsistence strategies within the whole area (Svoboda et al., 2011).

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Milovice I, Břeclav district

Martin Oliva, Moravian Museum Brno

The Milovice I site – "Mikulovsko" lies between 225 and 240 m above sea level on a short and broad ridge about one kilometre SSW of Milovice. In the NE to SE direction, the hill descends to a valley, the bottom of which lies at 200 m a.s.l. immediately below the station. About 600 m towards the north, this wide and dry valley becomes narrower, pointing towards the floodplain of the river Dyje. The current position of this river is about 3 km from

the station. The depth of the Quaternary sediments on the bottom of the valley is unknown, but they frequently contain mammoth bones. In the 19th century G. Lintner, a well-digger, struck a layer up to one metre deep in several places in the Milovice valley that contained numerous large bones.
Apparently, the Milovice I site was not discovered until 1949, when B. Klíma removed several mammoth bones from an ashy layer. Another mammoth bone layer was discovered there in 1986 when obtaining earth for the construction of the dam for the Nové Mlýny Reservoir. Excavations under the supervision of M. Oliva from the Anthropos Institute (Moravian Museum) lasted till 1991 (Oliva et al. 2008).
The earliest evidence for the presence of man (Aurignacian) came from soil sediments that occurred beneath the Gravettian layers. In the upper parts, up to ¾ m deep, these contained numerous stripes of dispersed charcoals and ash with Aurignacian artefacts and were deep brown in colour. In sector L, red burnt layers occurred in places, surprisingly enough, invariably in direct superposition. The situation documented is entirely unique and difficult to explain: the local aggregations of chipped industry permeate through all ashy horizons with horizontal streaks of charcoals and red-burnt loess, the base of which has been dated to 32,030±370 BP, and the 60 cm higher level to 28,780±230 BP – as if fireplaces were maintained at exactly the same places and with a continuous supply of sediments from the higher part of the slope for three and a half thousand years.
The collection of Aurignacian artefacts belongs to the facies with prevailing carinated endscrapers, which simultaneously contains a number of ancient elements in the shapes of sidescrapers that make it similar to the bottom layers of the middle part of the Dolní Věstonice I site (Oliva, 2014).
The series of initial pseudo-gleys dividing the Aurignacian and the Gravettian is superimposed by a complex of washed loess, considerably altered in places by human activity. It is most intact in sector G where only a slight alteration of its surface is observed. The northern part of the inhabited area, however, has been dislocated by block slide, visible in a row of 75 metres. Considerable mixing of the cultural layers took place in the northern part of the locality where, in the uppermost parts of sector R, the finds were scattered in declined straight-stripped layers up to 60 cm in total depth. Differently coloured stripes of red soils can also be observed in an accumulation of mammoth bones found lower on the slope in sector B. In the northern part of the locality, the base of the redeposited Gravettian layer has been dated as 24,710 years old (fireplace in L), its upper part as 22,100 years old yet with a considerable deviation (fireplace in D). The layers described above were overlain by a 1.5 to 3.0 m calcareous sandy loess, without any marked darker horizons.
The settlement agglomeration yielded a number of radiometric dates, of which the 2 dates from the settlement in sector G are the most important:

GrN-14824: 25,220 ± 280 BP, charcoal, ashy zone N of the hut
GrN-22105: 25,570 ± 170 BP, charcoal from a fireplace near the entrance to the hut

An accumulation of mammoth bones in sector B is dated somewhat later (GrN-22104: 24,530 ± 300 BP), as well as the Northern sectors D and L.
A circular hut made of mammoth bones was discovered in Sector G on the top of the crest (Fig. 64), 10 thousand years older than similar structures from the Ukraine. However, large bones were only randomly used for lining, or weighting of the sides made from hides. The hearth was in front of the presumed entrance. The charcoals were superposed by red-burnt loam; such an arrangement arose probably from throwing loess on glowing cinders.
The lithic industry from sector G is the only one in Moravia where, instead of northern flints, Carpathian radiolarite prevails. Contacts in the eastern direction are indicated by the occurrence of seven artefacts made of limnosilicite, flake of eastern Slovakia or Hungarian obsidian, hungarian radiolarite, and two flakes of andesite the most abundant sources of which are found in central and eastern Slovakia and northern Hungary.
Backed tools (46%), mainly small points of various shapes, are the most important typological group. Here the frequent occurrence of ventral retouches at the ends is very conspicuous. Microlithic points and little notched pieces remain from the Mediterranean Gravettian.

Fig.64: SW part of the mammoth bone heap in Area B. Upper row: situation of some other areas.

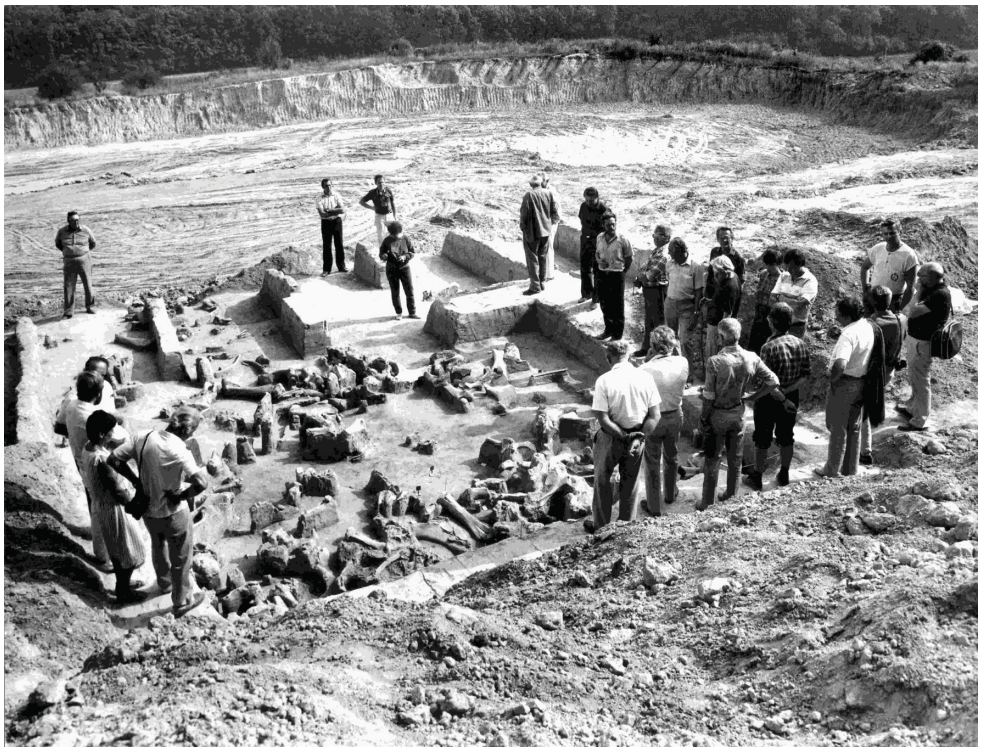

Fig.65: Commission examinating ther circular structure in Sector G.

It is difficult to imagine that it would be possible to use microgravette points in mammoth hunting; indeed, there are no ivory points here at Milovice, yet mammoth remains overwhelmingly prevail. Perhaps gravette points and backed bladelets were also part of composite weapons. Non-meat bones (scapulae, pelvises, molars) greatly outnumber those which might have been brought to the settlement because of their meat value (vertebra, ribs, paws) in all accumulations of mammoth bones (Fig. 65). Without doubt, skulls would also belong to this group, but because of their fragmentary nature they were not always retrieved. This is remarkably similar to the representation of mammoth bones in large accumulations at Dolní Věstonice I (Oliva 2014, 61-71). A child's burial site lay next to the remains of a mammoth pelvis above two scapulae in the large A-B accumulation of mammoth bones.

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Mikulčice–Valy

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In the 9th century, the early mediaeval hillfort Valy near Mikulčice was one of the most important Great Moravian centres. Unfortunately, written sources cannot enlighten us as to what the castle's name was or what role it played in the administration of the empire, economically or ecclesiastically. These questions can probably only be answered by archaeology, although even this cannot give a reliable answer. lt is certain that Mikulčice is a place with evidence of relatively long-term early mediaeval settlement, with the presence of all basic central functions; it is possible to talk about a comprehensive centre. These archaeologically proven qualities – settlement intensity, number of churches, concentration of power and riches – are not to be found in any other Moravian centre from the 9th century. The importance of Mikulčice at that time is most often compared with the early mediaeval settlement agglomeration in the area of Staré Město and Uherské Hradiště. Both locations – Mikulčice and Staré Město – have traditionally been searched to find the residence of Moravian rulers from the 9th century, as well as for Methodius' Panonian-Moravian archbishopric, without any unequivocal results for one or the other.

The archaeological advantage of Mikulčice is its good level of preservation and the existence of rare stratigraphic situations for our environment, enabling us to solve questions which would be impossible in other Great Moravian locations. Several opportunities appear to answer concrete questions regarding theoretical research into Mikulčice, Great Moravia and the Central European Middle Ages. lf the limited informational value of old research does not allow us to resolve these questions satisfactorily, more light can be brought into them in the future by field work. Areas that have already been dug out, representing around a fourth of the fortified area of the agglomeration, are in this sense lost to us and future generations, but can help to formulate new questions as well as to select specific situations for new detailed field work. The Mikulčice castle can be understood as part of a Mikulčice-Kopčany settlement agglomeration, from the 9th century, located on both banks of the River Morava. According to the latest research, the Chapel of St Saint Margaret of Antioch in Kopčany is the only still-standing Great Moravian sacral structure.

The settlement agglomerations of the power centre were originally located on several islands between the branched channels of the River Morava. The most important settlement area was located on elevated sand dunes that can still today be seen protruding from the relatively level surface of the alluvial plain. The original river bed eventually silted up after the downfall of the hillfort; the final levelling of the terrain was caused by floods of mud during modern times.

The total populated area of the Mikulčice agglomeration in the second part of the 9th century is estimated to be 30–50 ha. The core of this settlement and burial ground complex are two central structures with a total area of around 10 hectares - an acropolis and outer bailey. During the 9th century both structures were fortified with a wooden-clay fortification with a front stane wall; also a ring of river meanders offered added protection. The bank of the river bed in front of the fortification was supplemented with a multiple palisade of wooden posts; the acropolis was also strengthened with a stone wall. The purpose of these bank structures was primarily to protect the fortification and other settlement parts against erosion caused by the river. The acropolis fortification and outer bailey had several gates and were connected with wooden bridges. These structures made it possible to connect both central structures together and with their extramural settlements.
The extramural settlements with burial grounds and churches too were located on islands further around a fortified centre.
The acropolis contained the most important structures – churches, the palace and other residential structures. This was primarily a place of residence for the elite of that time – the prince and noble families, the clergy and probably even craftsmen working for the prince's „court", and of course servants.

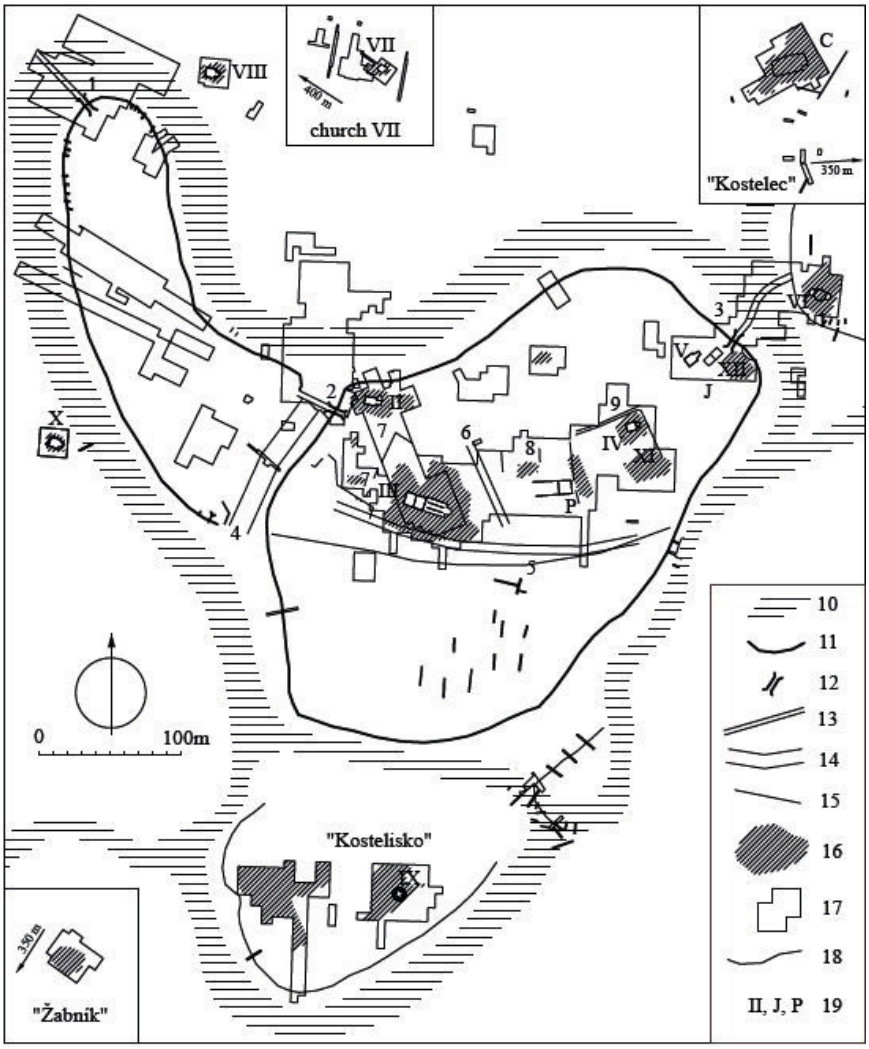

Fig. 66. Layout of the fortified agglomeration care with important archaeological structures highlighted: 1 – NW outer bailey gate; 2 – W acropolis gate; 3 – NE acropolis gate; 4 – ditch between outer bailey and acropolis; 5 – ditch south of the basilica; 6 – ditch between basilica and „palace"; 7 – palisade fencing of area around the basilica (church No. 3); 8 – marks of palisade walls or fences N of the „palace"; 9 – path and palisade around the church No. 4 area. Legend: 10 – expected location of dry river channels; 11 – fortification; 12 – gate; 13 – bridge; 14 – ditch; 15 – palisade, fence; 16 – burial ground, group of graves; 17 – area researched; 18 – terrain edge; 19 – existing church number. „Palace" (P); jewellery workshop (J); hypothetical cultic structures (C). Graphics Otto Marek – Petr Čáp.

Report on the 61st Annual Meeting of the Society in Erkrath April 23rd to April 27th 2019

Thorsten Uthmeier

The 61st Annual Meeting of the Hugo Obermaier Society was held from the 23rd to the 27th April 2019 in the Stadthalle of Erkrath and the NeanderthalMuseum in Mettmann. The society had been invited by the NeanderthalMuseum and its director, Dr. Bärbel Auffermann, and its former director, Prof. Dr. Gerd-Christian Weniger. The annual meeting was organized by Dr. Andreas Pastoors and the team of the NeanderthalMuseum. After the welcome speeches of Dr. Dr. Bärbel Auffermann, representatives of the city of Erkrath and the president of the society, the sessions started.

This year, the order of the sessions was reverse began with the youngest periods and Presentations on the Neolithic, Mesolithic and Late Paleolithic. The first speakers were *Wolfgang Heuschen, Michael Baales* and *Jörg Orschied*, who talked about **„A Pleistocene-Holocene transitional industry from the Blätterhöhle rock shelter (Hagen, Westphalia)"**. The Blätterhöhle is one of the most important Mesolithic-Neolithic caves sites excavated in the last decade in Germany, and it became known to wider public due to the numerous human remains and paleogenetic investigations into past diets. Here, the team reported about the presence of two stratified assemblages of the Mesolithic Rhine-Meuse-Schelde-Group. The lithics, which include several backed monopoints, partially backed points with a bent tip and curved-backed points, are well comparable to assemblages of the French "Epi-Laborien" dating to the Pleistocene-Holocene boundary. It followed a contribution by *Taylor Otto, Jörg Linstädter, Abdesalam Mikdad* and *Gerd-Christian Weniger* about **"Hassi Berkane and Late Iberomaurusian Subsistence in Northeast Morocco"**, which elucidated the patterns of settlement, procurement of raw materials and mobility of more than 300 Middle Paleolithic sites discovered in the course of surveys conducted by the DAI, INSAP and the CRC 806 "Our Way to Europe". The session proceeded with *Julia Kotthaus*, who reported about **"Between the caves and the sea: investigating the British late glacial Paleolithic"**. Emphasizing the problematic database, she pointed out that most of the assemblages are surface finds. Therefore, the observed differences between the Late Upper Paleolithic Creswellian and Federmesser assemblages await a crosscheck by new excavations. Afterwards, *Arantzazu Jindriska Pérez Fernández, A. Alday-Ruiz* and *E. Iriarte-Avilés* gave an overview over their investigations of the **"Microstratigraphy in the Pleistocene-Holocene transition sequence in the Upper Ebro Valley, Northern Spain: Reconstructing environments and Changes in human activities and natural, anthropogenic and post-depositional formation processes"**. Based on analysis of the sedimentary infills of three cave sites, Socuevas, Martinarri, and Atxoste, they reconstructed different types of human occupations and the intensity of the human activities. After the coffee break, the next session Included "Presentations on the Aurignacian" and started with a talk by *Olaf Jöris, Tim Matthies* and *Peter Fischer* about **"At the northern edge of the habitable world. New results from the Aurignacian open-air site of Breitenbach, Sachsen-Anhalt, Germany"**. Surveys and excavations conducted at Breitenbach over the past 10 years testified an overall size of the open-air site of 6.000 to 10.000 sqm. The multi-disciplinary investigations revealed a change from a more ephemeral use of the site in the lower layer to intensive occupations in the upper one resembling those of the large base camps of the Gravettien. The session was continued with a contribution by *Guido Bataille, Michael Bolus* and *Nicholas J. Conard* about the **"Technological variability in the Aurignacian of Geißenklösterle and Hohle Fels (Southwestern Germany)"**. Recent analysis of assemblages from the Hohle Fels showed that the blank production in layers IIIa and IV significantly differs from other regional Aurignacian assemblages in so far that bladelets are produced from burin cores rather than from broad faced carinated cores on flakes. The "Hohle Fels IV facies" nevertheless shares techno-typological features of other Swabian assemblages, which are dominated by carinated cores. The occurrence of split-based osseous points speaks for an Early Aurignacian. However, the marked differences do not allow a full equation with facies of the Western European Aurignacian. Therefore, the former propose classification as "Swabian Aurignacian", which encompasses the overall

functional variability of the region, is seen as being supported by the new evidence. The next talk of the session, presented by *Isabell Schmidt* and *Andreas Zimmermann*, touched a large-scale questionnaire by investigating **"Population estimates for the Aurignacian of central and western Europe"**. Their analysis is part of a series of similar investigations into the demography of all in all nine Paleolithic time periods at the University of Cologne following the same protocol. For the Central and Western European Aurignacian between 42 ka BP and 33 ka BP, they reconstructed a mean meta-population of 1,500 people only. Due to the fact that this is below the assumed carrying capacities, the authors discussed a "social carrying capacity" as a possible demographic threshold. The last oral talk of the first day was the Presentation of the Hugo Obermaier Research Grant Awardee 2018. The awardee, *Senka Plavšić*, reported about her **"Excavation of Meča Dupka cave site: Study of the late Middle Paleolithic and the emergence of Upper Paleolithic in southeast Serbia, Balkans"**. New excavations of 6 sqm in the southern niche of the cave revealed a hitherto unknown stratigraphical sequence with 3 layers not affected by post-depositional processes. Although not clear fossil types were present, the lithics of the newly excavated layers are still of Upper Paleolithic character and thus add substantial knowledge to the formerly known Middle Paleolithic layers in other parts of the cave. The measurements of the samples taken for radiocarbon dates will elucidate the age of the Upper Paleolithic component.

It followed the Poster Session with numerous posters dealing with **"New Perspectives on Neanderthal Behavior"**, **"Mesolithic and Late Paleolithic"**, **"Site Reports"** and **"Methodical Advances"**. The first day ended with the Evening Reception at the Neanderthal Museum, where wine and snacks were served.

The second day (Tuesday, the 24th of April) was dedicated to the Special Session "New Perspectives on Neanderthal Behavior". Due to the many talks, the session was divided into four parts. The session started with the presentation **"Between the Middle and the Upper Paleolithic in Moravia: Current state of the art"** by *Petr Škrdla, Tereza Rychtaříková, Jaroslav Bartík, Ladislav Nejman* and *Yu. E. Demidenko*. A mosaic of lithic industries characterizes the Moravian transition between the Middle and the Upper Paleolithic: the Bohunician, dominated by the Levallois concept, the Szeletian, with bifacial reduction and Upper Paleolithic technology, and the Upper Paleolithic Aurignacian with microlithic bladelets. Chronologically, the Bohunician and Szeletian overlap and both disappear with the Heinrich 4-Event. Recently, two novel industries were discovered in the course of excavations, both dating to GI 11. Whereas the Bohunician from Orechov IV shows a hitherto unknown microlithization of Levallois points and bladelets, the Lisen-Podoli I-industry is an Upper Paleolithic industry with Lincombian-Ranis-Jerzmanovician, Szeletian and Bohunician components. It followed a contribution by *Małgorzata Kot* about **"Truncated-faceted pieces from Beedings (Great Britain)"**. Bifaces, Kostenki knives and cores of the Lincombian-Ranis-Jerzmanovician open-air site were investigated by working step analysis. It turned out that truncating-faceting played a major role in the production and maintain ace of bifacial tools, including leafpoints, as well as in the re-use of these pieces. The next representation about **"New research on Middle Palaeolithic stone tools from the type site of Homo neanderthalensis"** by *Ralf W. Schmitz, Alfred Pawlik, Susanne C. Feine* and *K. Felix Hillgruber* referred to one of the visits of the excursion. The excavation of the back dirt of the type site in the 1990ties resulted in more than 70 human remains belonging to two Neanderthal individuals, and more than 2,000 artifacts, including *Keilmessers* and Groszaks. The latter were analyzed recently by micro-wear, which revealed that the microliths were hafted implements of multicomponent tools used for a large array of activities. Rather unusual is the site context of the **"North Sea treasure trove: The first Dutch Neanderthal birch tar"**, presented by *Marcel J.L.Th. Niekus, Paul R.B. Kozowyk* and *Geeske H.J. Langejans*. The birch tar covered most parts of an undiagnostic lithic artifacts collected from an artificially constructed beach. The close cooperation with the building company allowed an approximation of the original find spot, now being submerged, and a reconstruction of the original topographical context. Direct radiocarbon dating, pyrolysis–gas chromatography–mass spectrometry and micro-CT were used to further analyze the 50,000-year-old piece.

After the coffee break, the special session was continued by *Davide Delpiano, Marco Peresani* and *Andrea Zupancich*, who reported about **"Backed tools in the Late Middle Paleolithic: design, manufacture and use of an uncommon artefact in Discoid assemblages"**.

The investigation of one of the largest Middle Paleolithic assemblages with backed implements from Grotta di Fumane, Unit A9, which is dated to 47,6 ka BP and characterized by a discoidal core reduction, integrated both typo-technological and use wear analysis. The results show that backing was a common strategy to enhance the performance of manual handling of curated tools, but was not systematic nor was it used for hafting. Whereas these results indicate the presence of features of "modern behavior" already in the Middle Paleolithic, the analysis of *Manuel Will, Viola C. Schmid, Michael Bolus* and *Nicholas J. Conard* speak for a different regional pattern. Their **"New insights on technological behavior of Late Pleistocene Neanderthals from Middle Paleolithic assemblages of Geißenklösterle Cave, Germany"** assume marked differences between the regional Middle and Upper Paleolithic technologies. The assemblages from levels AH IV to VIII, dated to 90-45 ka BP, were mainly produced from local raw materials by Levallois methods and lack bifacial implements. The low densities of archeological finds, the export of artifacts and the lack of features indicate short-term occupations and a high degree of mobility. The results underline the overall inter-assemblages similarity and argue for a sharp break within the Geißenklösterle sequence between the Middle and the Upper Paleolithic. The more general topic of the **"Functional design of the Late Middle Palaeolithic? Testing Keilmesser in controlled experiments"** was presented by *Lisa Schunk, Ivan Calandra, Walter Gneisinger, Olaf Jöris* and *João Marreiros*. It is well acknowledged that Keilmessers have one active working edge with different qualities at different sections. To tackle the question whether this can be equated with a multifunctional use, Keilmessers from Balver Höhle and Buhlen are investigated following a new, interdisciplinary protocol. The pieces are 3D scanned, followed by a semi-automatic calculation of the edge angles at defined steps. Based on this, replicas of the different edge angles are produced using the same raw material than the originals. Automatized experiments and use wear analysis help to identify the potential use of different angles and thus contribute to a better understanding if the Keilmesser concept. The talk of *Jens Axel Frick* about **"The spatial and temporal distribution of the tranchet blow phenomenon during the Middle Paleolithic in Western and Central Europe"** elucidated a phenomenon often seen as being closely related to Keilmessers. Instead, an in-depth survey of the literature showed that lateral sharpening flakes and negatives thereof occur from MIS 3 to MIS 9.

After the coffee break, the special session went on with a talk by *Andrea Picin* about **"Neanderthals settlement dynamics: a diachronic perspective from Central Europe"**, based on novel analysis of assemblages from Markkleeberg (MIS 8), Zwochau (MIS 7), Rabutz (MIS 5e); Neumark-Nord level 2/0 (MIS 5a) and Königsaue (MIS 3). Despite some changes through time, such as the decrease of raw material size and the innovation of Keilmessers, other knapping strategies remained unaltered. This is interpreted as a long-term stability in the area. The following presentation by *Kseniya Kolobova, Maciej Krajcarz, Alena Shalagina, Magdalena Krajcarz, Svetlana Shnaider* and *Andrey Krivoshapkin* moved the geographical focus to **"Neanderthal mobility pattern in Altai Mountains"**. The authors reported about their attempts to identify related Middle Paleolithic occupations at different sites by comparing the raw material procurement strategies, the hunting tactics and the lithic technologies of Chagyrskaya and Strashnaya Caves, which both yielded the same industry and are situated in adjoining river valleys. It followed a talk by *Alena Shalagina, Kseniya Kolobova* and *Sergei Markin* about **"The significance of bifacial technology in the Middle Paleolithic of Altai Mountains"**. The manufacture and use of bifacial tools was previously thought to be situational and thus without significance for the differentiation of regional industries. Novel analysis of assemblages from Chagyrskaya Cave and Okladnikov Cave revealed that the opposite is the case. The bifacial tools from this sites follow a strict plan-convex concept and often result in Keilmessers. To the contrary, bifacial tools of the Karabom industry were bi-convex. The fact that plan-convex bifacial tools in the Altai are exclusively manufactured by Neanderthals is taken as an argument to link the appearance of this species with this tool concept.

After the coffee break, the last part of the Special Session on "New Perspectives on Neanderthal Behaviour IV" started with *Lutz Kindler* and *Olaf Jöris*, who presented **"A Thought Experiment: Raising a Neanderthal Baby today: A Paleo-ethological Perspective on Neanderthals and Human Behavioural Evolution"**. Their main aim was to stimulate an integration of the many disciplines at work during the analysis of human behavior under the methodological umbrella of N. Trinbergen´s ethological approach. The special session

ended with a presentation by *Jordi Serangeli, Bárbara Rodríguez Álvarez, Ivo Verheijen* and *Nicholas J. Conard* about **"Gatherers, hunters and more than ten dead elephants in Schöningen"**, which bridged the Middle and the Lower Paleolithic. The team found the remains of ten straight-tusked elephants from Saalian deposits, showing that these animals were regularly hunted.
After a short break, *Yvonne Tafelmaier* and *Andreas Pastoors* gave an overview over their research into the Middle Paleolithic (mainly in the institutional frame of the Neanderthal Museum) in the Public evening lecture **"Dem Neandertaler auf der Spur".** The second day of the annual meeting finished with the Conference Dinner at the Restaurant Neandertal N°1 right opposite to the NeanderthalMuseum.
The last day of presentations (Wednesday, the 25th of April) started with "Presentations on Site Reports" and was opened by *Merlin Hattermann´s* talk about **"Losing Everything? A Report on the Felsenhäusl-Kellerhöhle, Altmühl Valley"**. The Felsenhäusl-Kellerhöhle is a small cave near to the Sesselfelsgrotte in the Lower Altmühl Valley and was excavated without much documentation. A detailed analysis of the lithic artifacts on the one hand and the available stratigraphical information on the other revealed stratigraphic mixing, which allowed to differentiate a Micoquian and Magdalenian assemblage on techno-typological grounds only. The results are nevertheless an important contribution to the knowledge of the settlement pattern of the regional Paleolithic. The presentation of *Jürgen Richter, Thorsten Uthmeier, Andreas Maier* and *Florian Sauer* was a resumée of **"A decade of research and excavation at the Magdalénian open-air site at Bad Kösen-Lengefeld"**. Large scale excavations on an area of about 100 sqm showed that the stratigraphy at Bad Kösen-Lengefeld has two archaeological levels (AHs), embedded in the uppermost part of a loess-cover, which was core-drilled to a maximal thickness of more than nine meters. Only the upper archaeological level has been excavated so far on larger scale. It yielded several in-situ features, such as complex fireplaces and postholes, as well as concentrations of limestone slabs forming a pavement. In concert with the distribution of the lithic artifacts and faunal remains, these enabled the detection of intra-site structures. Another important find category of the site, which is radiocarbon-dated to 15,350 calBP, are engraved lime stone slabs. Chronologically older are the finds presented by *Armando Falcucci, Nicholas J. Conard* and *Marco Peresani,* who conducted **"A re-evaluation of the Protoaurignacian sequence at Fumane Cave in northern Italy"**. The rock shelter is well known for its Aurignacian sequence stretching from levels pre-dating the Heinrich 4-Event to those post-dating it. This allows to test if the "Aquitanian Model", e.g. the emergence of a Proto-Aurignacian followed by a Classical Aurignacian, also fits to other regions. It turns out that in Grotta di Fumane, techno-typological features of the Proto-Aurignacian persist throughout the sequence. The case study therefore does not support a transfer of the "Aquitanian Model". The same industry, e.g. the Aurignacian, was in the focus of the talk by *Wei Chu, João Marreiros, Adrian Doboș, Alexandru Ciornei, Jacopo Gennai, Thomas Albert, Florian Peudon* and *Jürgen Richter* about **"New excavations and functional analyses of the early Upper Paleolithic assemblage from Românești-Dumbrăvița, Romania"**. The site has been re-evaluated by excavations and subsequent multi-disciplinary analysis by the team of the CRC "Our Way to Europe" at the University of Cologne. First use wear analysis contribute to the knowledge about functional differences between the Proto-Aurignacian and the Aurignacian. The report of *Jonathan Schoenenberg* about **"Intra Ansab 1, preliminary results of the Find Distribution of an early Ahmarian site in the southern Levant"** was dedicated to one of the possible forerunners of the Proto-Aurignacian. The site is under excavation since 2015 and has yielded an Early Ahmarian assemblage from an excavation area of 30 sqm. 3D-data for the position of each larger find allow a detailed analysis of the vertical and horizontal distributions, which support the hypothesis of an in-situ preservation of the archaeological level. The presentation of *Nicholas Conard, Gregor Bader, Viola Schmid, Chantal Tribolo* and *Manuel Will* about **"New results from Middle Stone Age of Kwa-Zulu Natal, South Africa"** were dealing with more southerly find regions. Intensive fieldwork at the Middle Stone Age (MSA) sites of Sibudu and Umbeli Belli allow the analysis of diachronic developments as well as synchronic variability. The deep sounding at Sibudu pushes back the regional context to 100 ka BP. Together with data from Umbeli Belli and the collection of Holley Cave, the regional chronological sequence of "Still Bay", "Howiesens Port" and "Sibudan" lithic industries is elucidated in this regard.

The last talk in this session was given by *Thorsten Uthmeier, Avi Gopher* and *Ran Barkai*, who reported on **"The bifacial tools of the Acheulo-Yabrudian Cultural Complex from Qesem Cave, Israel: a techno-functional analysis"**. Despite its long Acheulo-Yabrudian sequence, spanning between 200 ka BP and 400 ka BP, and the wealth of lithic artifacts, faunal remains and evident as well as latent features, Qesem cave has yielded only a low number of bifacial tools. These were documented by 3D-models produced by Structure-from-Motion technique. Work step analysis showed that the shaping of inclined lateral parts near to the base of the handaxes, which dominate the small assemblage of bifacials, was part of an overall concept to manufacture sharp working edges opposite to a back to enhance the manual application of considerable amounts of manual cutting energy.
In the afternoon, the "Presentations on Methodical Advances" started with a contribution of *Ivan Calandra, Walter Gneisinger, Antonella Pedergnana, Lisa Schunk, Eduardo Paixao* and *João Marreiros* about **"The TraCEr laboratory: developing experimental programs combining material properties, variable control and use-wear quantification"**. Despite its high potential, use wear analysis has been criticized in the past for a lack of standardization and quantification. To tackle this, the RGZM in 2017 founded the Laboratory for Traceology and Controlled Experiments (TraCEr). The talk presented the newly developed research design for controlled experiments used as analogy for the interpretation of use wear observed on archaeological artifacts. The protocol starts with an analysis of the raw material properties, followed by automatized experiments that allow to control each variable forming potential use wear. In addition, human agents contribute to the understanding of the possible variability. In a final step, 3D models help to locate and quantify the experimental use wear. The following three talks concentrated on the properties of lithic raw materials. The first speakers, *A. Malago, Y.-M. Hou* and *O. Jöris*, reported about **"Hardness and Knappability – What do quantitative raw material properties tell us about hominid behavior"**. A sample of 100 Mode-2 artifacts and raw material samples from China were measured for their hardness and density. The correlation between both variables is interpreted as a measure for the knappability. It turns out that the Hornfels raw material preferred during Mode 2 in China is difficult to knap due to its density. It follows that the early hominins already were capable of handle complex geometries to obtain the anticipating products. The second talk about raw material was given by *Alejandro Prieto, Maite García-Rojas, Iñaki Yusta, Alvaro Arrizabalaga* and *Javier Baena* about **"Procurement and Management of raw material in El Arteu and El Habario: Geo-Archaeological characterization of quartzite in the Cantabrian region (NW Spain)"**. Quarzite is the second most frequent raw material in Paleolithic archaeology, but by far less investigated and less precisely defined than chert. The team therefore investigated the quartzite from a Cantabrian micro to meso-region using three different steps: first, the petrographic, geochemical and binocular analysis of raw material samples from surveys, second, the macroscopic non-invasive analysis of original archaeological material from the sites, and third, spatial analysis using GIS. Whereas one focus was the definition and classification of different types of "archaeological quartzite", the other aspect was a case study of the Middle Paleolithic sites of El Habario and El Arteu. The latter showed that this mountainous region in Cantabrian Spain was not a barrier, but instead a region regularly and systematically used by Middle Paleolithic groups. The third talk dedicated to raw material, **"Searching for chert heat-treatment in Moravian Magdalenian"**, was presented by *Martin Moník, Zdeňka Nerudová* and *Petr Schnabel*. Starting from the observation that some artifacts of Greyish-greenish Jurassic chert (Olomucany chert) showed a suspiciously reddish color, they analyzed the artifacts and reference samples with Infrared Spectroscopy (FT-IR) and Paleomagnetic measurements (IRM). Both methods were only able to produce results on specific questionnaires: whereas FT-IR was appropriate to investigate thin artifacts, IRM only detected non-heated artifacts. The next talk by *Nadine Huber* and *Harald Floss* reported about **"The portable art of Solutré (Burgundy, France). Reflectance transformation imaging, a portable and low-cost solution to the imaging of Paleolithic art objects".** In the course of the analysis of all mobile art items from the site, the photo-based method of reflectance transformation imaging was applied using a portable setup. The inexpensive and portable method allowed the identification and analysis of even very fine engraving. *Hannah Parow-Souchon* was the last speaker of this session and talked about **"Unriddling variability – testing hypotheses on assemblage variability"** with the help of

Canonical Correspondence Analysis (CCA). Exemplified data came from the in Central Germany Azilian and the Levantine Upper Paleolithic and showed that the CAA not only allows to identify groups, but at the same time enables to test hypothesis about the causes of the grouping.
After the coffee break, the program of the annual meeting came to "Presentations on Human-Animal Interaction". The line of presentations was opened by *Susanne C. Münzel, Thomas Hess, Angel Blanco-Lapaz* and *Nicholas J. Conard* about **"Faunal remains of Helga Abri, a Late Magdalenian/Early Mesolithic rockshelter in the Ach Valley near Schelklingen (Swabian Jura)"**. The analyzed material mainly stems from Late Magdalenian and Mesolithic levels excavated by Joachim Hahn during the 1970ties and 1980ties and dating to 16-14 ka BP and 10.2- 9.2 ka BP, respectively. Basically, the two faunal assemblages were markedly different with the Magdalenian being dominated by cold and the Mesolithic by warm species. However, there were also temperate species among the Magdalenian fauna, such as beaver, roe deer and wild boar, underlining the difficulties of too simplistic equations of single temperate species with moderate to warm environments. The next talk by *Chris Baumann, Britt M. Starkovich, Dorothée G. Drucker, Susanne C. Münzel, Nicholas J. Conard* and *Hervé Bocherens* was dedicated to the **"Isotopic and ecological niches of commensal and domestic Magdalenian canids"**, followed by *Elaine Turner, Louise Humphrey, Abdeljalil Bouzouggar* and *Nick Barton* about **"Subsistence strategies during the Middle Stone Age: evidence from the Grotte des Pigeons, Taforalt, Morocco"**. The archeozoological analysis focused on the Middle Stone Age (MSA) layers of the site. Although a wide range of animals was procured, prima age adults of Barbary sheep and other medium sized animals were the preferred prey. Entire carcasses were brought to the site and all body parts were processed, including the extraction of marrow. With regard to diachronic comparisons, it is remarkable that the same hunting strategies were applied during both the Aterian and the late MSA. The last speaker of this year´s annual meeting was *Shumon T. Hussain*, who talked about **"After the 'animal turn' – re-configuring the study of human-animal relations in Paleolithic archaeology"**. The aim of the paper was a critical assessment of the potential of a multi-scalar and multi-agency approach to investigate human-animal-relationships after the "animal turn". As a result, a novel methodological perspective was proposed, which integrates human, animal and spatial agencies.
After the sessions were finished, the president of the society, Thorsten Uthmeier, again thanked the NeanderthalMuseum – and especially Dr. Bärbel Auffermann and Prof. Gerd-Christian Weniger – for the kind invitation, and PD Dr. Andreas Pastoors, the team of the NeanderthalMuseum and the student helpers for the organization of the annual meeting. In addition, he thanked Dr. Andreas Maier, the secretary of the society, for the work he invested in the organization of the meeting and the editing of the abstract book. The day before the excursions ended with the Society's Annual General Meeting and the Get-together dinner at the Restaurant Neandertal N°1.
During the first day of excursions (Friday, the 25th of April), Excursion A led the participants in the morning to sites of the Federmesser groups and the Mesolithic near to **Mönchengladbach-Geneicken**. Overall, 225 drilling cores in sediments of the ancient floodplain of the Niers showed that sediments from the Late Glacial and the Early Holocene were preserved on an area of no less than nine ha. The fact that Late Paleolithic and Mesolithic had been collected from the surface already indicated the high potential for the presence of well-preserved archaeological sites of prehistoric hunter-gatherers. The construction of an artificial basin to store surface water made necessary the control of the construction works and, if present, the excavation of archeological sites. *Martin Heinen*, who reported the results of the fieldwork to the visitors (Fig. 1), led the excavations. Within an area of 4,000 sqm, ten sites of the Late Paleolithic Federmesser groups were found. Most of them were placed near to the then river meanders of the Niers, only some meters away from the lake-like floodplain. In addition to lithic, also faunal remains – otherwise rare in the Rhineland – were excavated, including wild horse, red deer, beaver and fox. The mapping of burnt artifacts made possible the detection of former fireplaces. In two cases, the Niers was used an underwater waste disposal. The dominating raw material is Nordic flint, which was transported from the North of the Ruhr, as was the rare Vetschau flint, which stems from the Aachen region. The Mesolithic was located at four sites, each consisting of a small concentration of lithics. In addition, the almost complete skeleton of a female aurochs was found scattered over 25 sqm.

The good preservation allowed to reconstruct a kill- and butchering site, from which the meat bearing parts were taken to a nearby site (possibly corresponding to one of excavated concentrations mentioned above), and the waste being thrown into the shallow Niers.
It followed a visit to the archaeological site of **Rheindahlen**, which is well known for its Middle Paleolithic layers embedded in a comparably long loess sequence characterized by several soil formation horizons. Main excavations were conducted by Gerhard Bosinski in the 1960thies and by Ralf-W. Schmitz and Jürgen Thiessen in 1995 to 1997. Recently, a team led by *Andreas Pastoors*, FAU Erlangen-Nürnberg and *Martin Kehl*, University of Cologne reopened the sequence for a re-evaluation of the stratigraphy (Fig. 2). The new investigations became necessary because two contrasting interpretations of the sequence are still discussed. The conventional version dates the first interglacial Bt, termed Erklenzer Bodenand found below the recent soil and a upper loess unit, to the Eemian (MIS 5e). Conversely, W. Schirmer is of the opinion that this soil is either missing or has been overprinted by the recent Holocene soil formation. Consequently, the interglacial soils below, e.g. the Rheindahlener Boden and the Wickrath-Boden, are to MIS 7. Martin Kehl explained in length and with the help of a poster (Fig. 3) the new interpretation of the sequence and the first results of absolute OSL-dates. Afterwards, *Ralf-W. Schmitz*, LVR LandesMuseum Bonn explained the archaeology of Rheindahlen. While level B3 is awaiting a publication in full length, the finds of level B1 became famous due to the combination of Levallois as well as laminar concepts of core reduction and truncated-facetted pieces classified as Kostenki knives, which often show the negative of a lateral sharpening flake. The last point of interest in Rheindahlen was the Archaeological Museum in the Water Tower, where *Bernd Hussener* and *Andreas Pastoors* guided the tour (Fig. 4). In the early evening, the excursion visited the lignite mine of **Garzweiler**, where *Franziska Schmid*, University of Cologne gave an overview over a running project focused on the survey of Neolithic settlement. It followed a short report on Middle Paleolithic sites by *Thorsten Uthmeier*. Surveys conducted in the past along and also on the steps of the active walls of the Garzweiler lignite mine, right in front of the extraction machines, led to the discovery of numerous Paleolithic sites. The most important ones were small find scatters of lithic artifacts and faunal remains found slightly re-deposited in the gravels of the brooksides of small rivers and dated to MIS 4.
Excursion B of the second day (Saturday, the 25th of April) began with a visit to the **Neanderthal Museum** and to the place where the **Kleine Feldhofer Grotte** was to be found before the quarrying activities. *Andreas Pastoors* described the didactic concept of the recently renewed presentation of the eponymous site of the Neanderthal species (Fig. 5). The excursion was continued with a visit to the **LVR LandesMuseum Bonn**, where the group was led by *Ralf-W. Schmitz* and, at showcases with the finds from the famous site of Bedburg-Königshoven, by *Martin Street*. The excursion ended at the site of **Bonn-Oberkassel,** where *Ralf-W. Schmitz* (Fig. 6) gave an overview over the discovery of the double burial in 1810 during mining works for a new railway line, and subsequent excavations of remnants of the original sediment led by him and Jürgen Thissen in 1994, and by him alone in 2012. Thanks to multi-disciplinary research, the dating of the burial of a male and a female, accompanied by a domesticated wolf, could be made more precise: against first assumptions, which dated the burial to the Magdalenian, it now seems to be not older than 12-14 ka.
With the last stop, the 61st Annual Meeting of the Hugo Obermaier Society ended. It was again an intense, interesting and perfectly organized conference.

Fig.1: Martin Heinen (in the center, with red jacket) is guiding the participants of Excursion A near Mönchengladbach-Geneicken at sites of the Federmesser groups and the Mesolithic

Fig.2: Martin Kehl at Rheindahlen in front of the reopened section. The archeological finds of the Middle Paleolithic level B1 were found in geological layer "EH", which is part of the Erkelenzer Boden soil complex (the Bt-horizon marked with "Er")

Fig.3: Martin Kehl explains the preliminary results of new investigations of the loess section at the quarry of Rheindahlen

Fig.4: Andreas Pastoors in front of the Water Tower of Rheindahlen (on the right, with a map under the arm, Ralf-W.Schmitz)

Fig.5: Andreas Pastoors in front of an installation that marks the position of the Kleine Feldhofer Grotte. In the course of quarrying activities, the former limestone cliff has been destroyed completely. The present installation marks the horizontal position of the cave, which before its destruction was located several meters above

Fig.6: Ralf-W. Schmitz at the site of Bonn-Oberkassel

Bericht über die Mitgliederversammlung anlässlich der 61. Tagung der Gesellschaft in Erkrath und Mettmann

Andreas Maier

Am Donnerstagnachmittag (25. April, 18:30 Uhr) eröffnete der Präsident der Gesellschaft die Hauptversammlung. Anwesend waren 41 Mitglieder. Zunächst wurde ohne Einwände festgestellt, dass die Einladung zur Mitgliederversammlung allen Mitgliedern rechtzeitig zugeschickt worden war und die Tagesordnung wurde angenommen. Anschließend verlass der Präsident den Jahresbericht des Geschäftsjahres 2018. Mit zwei Eintritten und einem Sterbefall hatte die Gesellschaft hatte vor Beginn der Tagung 246 persönliche und institutionelle Mitglieder. Die Anwesenden gedachten des verstorbenen Mitglieds Prof. Hansjürgen Müller-Beck mit einer Schweigeminute.

Der Kassenbericht für das Rechnungsjahr 2018 wurde durch die Schatzmeisterin Frau Dr. M.-J. Weber vorgetragen. Er enthielt folgende Punkte:

- einen detaillierten Bericht über Einnahmen, Ausgaben, Saldo des Geschäftsjahres zum 31.12.18 sowie zum aktuellem Stand;
- die Mitteilung über Ausgaben und Einnahmen der Tagung 2018 in Tarragona;
- den Hinweis auf die Möglichkeit der Einsichtnahme des Kassenberichtes.

Anschließend wurde der Bericht über die Kassenprüfung, die von den Mitgliedern Frau Ute Knötig und Herr Thorsten Helmerking durchgeführt wurde, verlesen. Die Kassenführung war einwandfrei; die Schatzmeisterin wurde auf Antrag aus dem Saal einstimmig entlastet (1 Enthaltung, keine Gegenstimme). Herr Uthmeier sprach im Namen der Gesellschaft Frau Knötig und Herrn Helmerking den Dank für die Tätigkeit als Kassenprüfer aus. Als Kassenprüfer für das neue Geschäftsjahr wurden Frau Ute Knötig und Herr Thorsten Helmerking bestellt.

Es wurde erörtert, wie Gelder aus den laufenden Kosten für den Förderpreis eingespart werden können. Die Umstellungen bei Quartär wurden positiv erwähnt. Es wurde diskutiert, ob die Gesellschaft aus dem Dachverband DVA austreten soll, um den Jahresbeitrag von 500,- € zu sparen. Es wurde angemerkt, dass bei einer Mitgliedschaft der Präsident automatisch im erweiterten Vorstand des DVA vertreten ist, was die Anliegen der Paläolithforschung dort stärken kann. Einschränkend wurde erwähnt, dass die im DVA diskutierten Anliegen für Paläolithiker oft weniger interessant seien (als Beispiels wurde das Zertifizieren privater Grabungsfirmen genannt) und das Paläolithikum auch ohne die HOG über die Landesämter vertreten bleibe. Hingegen wurde angemerkt, dass die Mitgliedschaft schon sinnvoll sei und die Frage aufgeworfen, ob die Möglichkeit einer verbilligten Mitgliedschaft bestünde oder ob die Jahresbeiträge der Gesellschaft erhöht werden könnten. Letzteres wurde mit dem Hinweis auf die vor wenigen Jahren vorgenommene Erhöhung abgelehnt.

Bei einem Meinungsbild stimmten 32 Mitglieder für einen Austritt, 4 dagegen und 5 enthielten sich.

Thorsten Uthmeier und Andreas Pastoors berichteten im Namen des Herausgebergremiums über den Stand der Vorbereitungen beim Band 65 des Quartär Jahrbuchs berichtet. Der Zulauf war gut und die Drucklegung soll in 2 bis 3 Monaten erfolgen. Quartär bleibt auch weiterhin in Scopus gelistet. Nach der fristgerechten Kündigung wird das gelayoutete PDF für die Mitglieder-Ausgaben durch den Verlag Dr. Faustus bei Inprint gedruckt. Der reguläre Handel wird über Print-on-Demand durch den Verlag Dr. Faustus bedient. Im Vergleich zum vorherigen Vorgehen bedeutet dies eine Ersparnis von ca. 1.500 €.

Zdeňka Nerudová lud die Gesellschaft im Namen des Mährischen Landesmuseums Brno für die 62. Jahrestagung vom 14. bis 18 April 2020 ein. Die Gesellschaft dankte Frau Nerudová für die Einladung.

Mara-Julia Weber und Andreas Maier berichteten zum Stand der Planungen zur gemeinsamen Tagung der SPF und der HOG in Straßburg.. Thema des Treffens werden Netzwerke, Territorien und Ausbreitungsprozesse vom Letzten glazialen Maximum bis zum Holozän sein. In drei Sessions, die von jeweils einem Keynote-Vortragenden eingeleitet werden folgen 5-6 Beiträge pro Thema.

Unter dem Punkt Sonstiges wurde über eine Verlegung des Tagungstermins diskutiert. Kritisch angemerkt wurde die für Familien ungünstige Überschneidung mit den Osterferien. Nach einem intensiven Meinungsaustausch ergab ein Meinungsbild dass 18 Mitglieder gegen eine Verlegung waren, 12 dafür und 11 sich enthielten. Nach diesem Votum sprach sich die Versammlung für eine online-Befragung aus, deren Ergebnis als Diskussionsgrundlage für die Mitgliederversammlung in Brno dienen soll.

In einem kurzen Statement wurde auf die Veränderungen in der Trägerstruktur beim paläon hingewiesen.

Es wurde diskutiert, ob man die Exkursionen nicht zwischen den Vortragstagen stattfinden lassen sollte. Mit dem Hinweis auf dadurch unter anderem steigende Raummieten sprach man sich gegen den Vorschlag aus.

Nach dem Dank an alle Beteiligten schloss die Mitgliederversammlung um 20:10 Uhr.

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