Hugo Obermaier-Gesellschaft
für Erforschung des Eiszeitalters und der Steinzeit e.V.

51st Annual Meeting in Ljubljana

14th–18th of April, 2009

Hugo Obermaier Society

for Quaternary Research and Archaeology of the Stone Age

Hugo Obermaier-Gesellschaft

für Erforschung des Eiszeitalters und der Steinzeit e.V.

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Inhalt *(Content)*

Alle Informationen zur Gesellschaft, den Publikationen, zu früheren Tagungen und zur Tagung in Ljubljana (Programm, Anmeldung, Lageplan, Hotelbuchungen etc.) finden Sie auch im Internet, unter:

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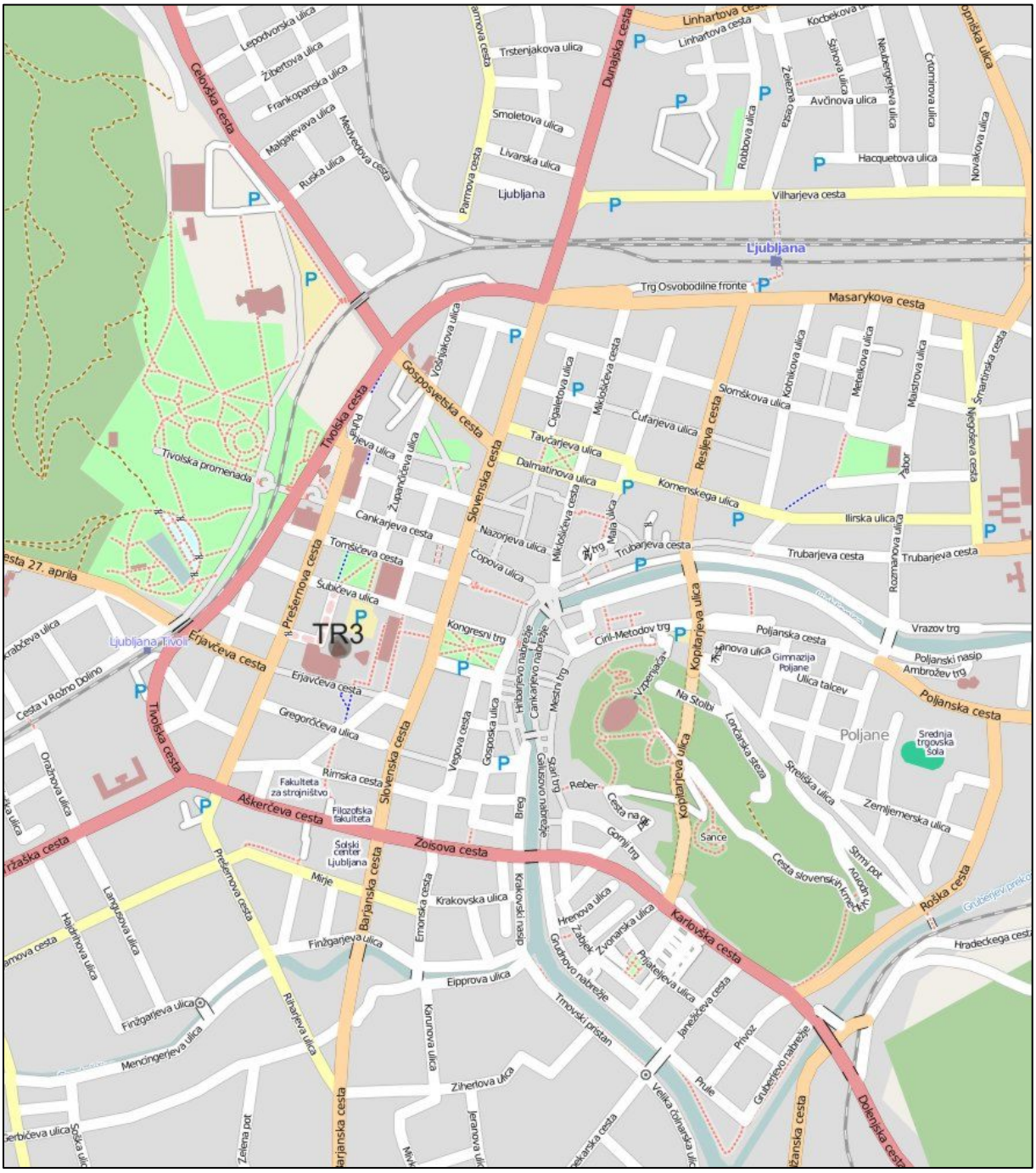

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Place of the congress:

***Congress Centre "TR/3"**, Trg republike 3, 1000 Ljubljana*
http://www.visitljubljana.si/en/ljubljana_and_more/essentials/tourist-database/78407/detail.html

Programmübersicht (*Brief program*)

Tuesday, April 14th

12:00	Registration
2:00 pm	Opening by the Direktor of the Archaeological Department, University of Ljubljana, Doc. Dr. Predrag Novakovič and by the President of the Hugo Obermaier Society, Dr. Christine Neugebauer-Maresch
2:20 – 6:15 pm	Reports and Poster session (*Coffee break* 16:00 – 16:30)

Wednesday, April 15th

8:30 – 1:00 pm	Session on special topic: Speleology and Prehistory (*Coffee break* 10:10 – 10:40)
2:00 – 6:00 pm	**Excursion I: Betalov spodmol Cave** Including reception (with presentation of the Slovenian TV film about the Divje Babe flute)
from 8:30 pm	**Common dinner in the restaurant "Šestica"** Slovenska cesta 40 (centre of Ljubljana)

Thursday, April 16th

8:30 – 12:15	Reports (*Coffee break* 10:10 – 10:40)
2:00 – 5:15 pm	Reports and poster session (*Coffee break* 3:40 – 4:10 pm)
from 5:30 pm	Closed Meeting for Society members (***Mitgliederversammlung***)
8:00 pm	Public lecture by Dr. Simona Petru (Ljubljana): „Paleolithic art in Slovenia".

Friday, April 17th **Excursion II: Divje babe and Križna jama**

(ca 8:30 am – 6:00 pm)

Divje babe: guided by V. Pohar, I. Debeljak,
Križna jama: guided by V. Pohar, G. Rabeder
Alternative program with rainy weather: Idrija-Mine, Mala Triglavca and Škocjanske

Saturday, Apr 18th **Excursion III: Krapina and Vindija (Croatia)**

(ca 8:30 am – 6:00 pm)

Krapina, cave and museum: guided by I. Karavanic
Vindija: guided by I. Karavanic, G. Rabeder.

Programm (*Meeting program*)

Tuesday, April 14th

12:00 – 14:00 **Registration**

14:00 **Opening of the congress**
by Direktor of the Archaeological Department, University of Ljubljana, Doc. Dr. Predrag Novakovič and by the
President of the HO Society, Dr. Christine Neugebauer-Maresch

Reports on Lower and Middle Palaeolithic (14:20 – 17:35)

14:20 – 14:45 *Jordi Serangeli, Utz Böhner, Hartmuth Thieme (all Hannover):*
The digging of the DB pillar in the opencast lignite mine in Schöningen – The Schöningen 12 II site

14:45 – 15:20 *Clemens Pasda (Jena):*
Bilzingsleben – Final report on the 2004-07 excavations

Werner Müller (Neuchâtel):
Bilzingsleben - the faunal remains of the recent excavations

15:20 – 15:35 *Andreas Pastoors (Mettmann):*
Bladelet production in late Middle Palaeolithic sites Balver Höhle and Salzgitter-Lebenstedt (Germany)

15:35 – 16:00 *Yvonne Tafelmaier (Köln):*
News from the Hönnetal – The case of the Middle Palaeolithic site Volkringhauser Höhle (Germany)

- coffee break -

16:30 – 16:55 *Dieter Schäfer (Innsbruck) & Thomas Weber (Halle/Saale):*
Westeregeln – an old site with new perspectives

16:55 – 17:20 *Yamandu H. Hilbert, Nicholas J. Conard & Anthony E. Marks (Tübingen):*
Ground stone tool taxonomy: An analysis of the MSA material from Mumba Cave, Tanzania

17:20 – 17:35 *Michael Bolus (Tübingen), Angela Bruch, Miriam Noël Haidle, Christine Hertler (all Frankfurt/M.), Andrew W. Kandel & Michael Märker (both Tübingen):*
The Role of Culture in Early Expansions of Humans – A New Research Center

17:35 – 18.15 **Poster Session**
(3 min introduction by the authors)

Open Discussion

Wednesday, April 15th

Session on "Speleology and Prehistory" (8:30 – 13:00)

8:30 – 8:55 *Boštjan Odar (Maribor, Slovenia):*
Perceptions of the Landscape: The cases of Potočka zijalka and Divje babe I

8:55 – 9:20 *Matija Turk (Ljubljana)*
Neandterthals in Divje babe I (Slovenia): effect of climate on visiting the cave

9:20 – 9:45 *Jörg Orschiedt (Hamburg/ Hagen):*
The Krapina case – new results on the question of cannibalism of Neanderthals

9:45 – 10:10 *Marco Peresani, Rossella Duches, Ivana Fiore, Fabio Gurioli, Simona Muratori, Matteo Romandini, Antonio Tagliacozzo, Sara Ziggiotti (Ferrara/Roma)*
The end of the Neandertal age at Grotta di Fumane, Northern Italy: first results of the last three years field campaigns

- coffee break -

10:40 – 11:15 *Andrej Mihevc (Postojna, Slovenia):*
1. Cryoturbation of the sediments at the cave entrances – case studies from Skednena jama, Potočka zijalka and Bestažovca cave
2. Claw marks and footprints of the cave bear from three caves in Slovenia

11:15 – 11:40 *M. Fiebig, D. Sahy, P. Häuselmann, W. Koerner, A. Mihevc, B. Schenk, & B. Grasemann (Vienna/La Chaux-de-Fonds, Switzerland/Postojna, Slovenia)*
Burial Age Dating in Caves

11:40 – 12:05 *Jörg Orschiedt (Hamburg/ Hagen):*
The Blätterhöhle in Hagen (Westphalia):
Preliminary report on the first archaeological investigations

12:05 – 12:30 *Susanne C. Münzel, Christopher E. Miller, Susanne C. Feine, Petra Kieselbach, Maria Malina, Nicholas J. Conard, Paul Goldberg (Tübingen/British Columbia, Canada):*
Living floors or Dumping Areas, Paleolithic Burnt Bone Layers and other Features from Hohle Fels Cave, SW Germany

12:30 – 12:55 *Ljiljana Pavičić, Marta Mileusnić, Dinko Radić, Ljerka Marijanac (Croatia):*
Sedimentological profile through Pleistocene-Holocene deposits of Vela spila cave, Croatia

Discussion

14:00 – 18:00 **Excursion I: Betalov spodmol Cave**
Including reception with some snack and drink
(with presentation of the Slovenian TV-film about the Divje Babe flute)

from 20:30 **Common dinner in the restaurant "Šestica"**
Slovenska cesta 40 (centre of Ljublj.), http://www.sestica.si/gostilna-sestica/

Thursday, April 16th

Reports on Middle and Upper Palaeolithic (8:30 – 12:00)

8:30 – 8:55 *Andrew W. Kandel and Nicholas J. Conard (Tübingen)*
Making sense of space in the Geelbek Dunes of Western Cape Province, South Africa

8:55 – 9:20 *Christopher E. Miller, Paul Goldberg, Solveig Schiegl, Bertrand Ligouis, Francesco Berna, Nicholas J. Conard, Lyn Wadley (Tübingen/Boston/Witwatersrand, RSA):*
A micromorphological study of Middle Stone Age bedding, hearths and site maintenance at Sibudu Cave, KwaZulu-Natal, South Africa

9:20 – 9:45 *Nicholas J. Conard, Knut Bretzke, Philipp Drechsler, Andrew W. Kandel, Mohammad Masri & Mareike Stahlschmidt (Tübingen/Damascus):*
Paleolithic settlement dynamics in the Damascus Province of Syria

9:45 – 10:10 *Kurt Felix Hillgruber (Tübingen):*
The Epipalaeolithic of Southwestern Syria

- coffee break -

10:40 – 11:25 *Saman Heydari-Guran, Elham Ghasidian & Nicholas J. Conard (all Tübingen):*
A geoarchaeological study of Paleolithic settlement systems and landuse in the Southern Zagros Mountains of Iran

Elham Ghasidian, Saman Heydari-Guran & Nicholas J. Conard (all Tübingen):
Ghar-e Boof: A new early Upper Paleolithic industry in southwestern Iran

11:25 – 11:50 *Zdeňka Nerudová & Petr Neruda (Brno):*
Moravský Krumlov IV – A New Multilayer Palaeolithic Site in Moravia (Czech Republic)

11:50 – 12.15 *Gerd-Christian Weniger (Mettmann):*
New investigations in Cueva Morín, Cantabria

Astrid Slizewski (Mettmann):
Regional differences in the late Middle Palaeolithic of the Iberian Peninsula - Data sampling and uploading into NESPOS

Discussion

- lunch break -

Reports on Upper Palaeolithic – Neolithic (14:00 – 17:15)

14:00 – 14:25 *Vida Pohar (Ljubljana):*
Palaeolithic of Slovenia

14:25 – 14:50 *Joanna Trabska (Rzeszow, Poland):*
Red iron oxides in a perspective of Palaeolithic Societies:
Potential sources in central Europe

14:50 – 15:15 *Ulrich Hambach (Bayreuth), Christine Neugebauer-Maresch (Vienna) & Leif Steguweit (Erlangen):*
New insights in old profiles: Rock magnetic-based loess stratigraphy and new radiocarbon data from the Upper Palaeolithic sites of Krems-Hundssteig, Willendorf III–VI and Stratzing (Lower Austria).

15:15 – 15:40 *Florian A. Fladerer & Tina Salcher-Jedrasiak (Vienna):*
Permanent Gravettian encampments?
Insights from the Krems-Wachtberg faunal remains.

- coffee break -

16:10 – 16:25 *Walpurga Antl (Vienna)*
Adornments from Grub Kranawetberg and possible contacts at the end of the Pavlovian

16:25 – 16:50 *Mara-Julia Weber (Schleswig/Tübingen), Ingo Clausen (Neumünster), Rupert Housley (London), Christopher Miller (Tübingen), Felix Riede (Aarhus/London) & Hartmut Usinger (Kiel):*
Preliminary results of the 2008 field work at the Hamburgian site Ahrenshöft LA 58 D

16:50 – 17:15 *Mihael Budja (Ljubljana):*
Who are the Europeans?
From the 'dinarization' to the 'neolithization' of Europe

17:30 – 18:00 **Mitgliederversammlung der HOG** *(HO Society members meeting)*

20:00	**Public lecture by *Dr. Simona Petru (Ljubljana):*** **"Palaeolithic art in Slovenia"**

Poster presentations in the entrance hall
(Tuesday 14th – Thursday 16th of April)

Emanuele Cancellieri, Marco Peresani, Giansimone Poggi, Mara Silvestrini, Valeria Lucani, Massimiliano Scotti (Ferrara/Ancona/Roma):
Distribution, suitability and characterization of flint sources in the Marche Appennine: the Upper Esino Basin

Döppes, Doris (Vienna), Pacher, Martina (Vienna), Pohar, Vidar (Ljubljana), Kavcik, Nadja & Gernot Rabeder (both Vienna):
Potočka zijalka – a Palaeolithic and cave bear site along the Slovenian/Austrian border

Florian A. Fladerer, Tina Salcher-Jedrasiak & Sandra Umgeher-Mayer (all Vienna):
Before the decline of the Mammoths: A reassessment of the 20 ka
Epiaurignacian site at Langmannersdorf in Lower Austria

Inge Hohenester, Leif Steguweit (both Erlangen), Gerhard Trnka (Vienna):
The lithic inventory of the Aurignacian site of Alberndorf, Lower Austria

M. Deva Jebb (Tübingen):
The Lower Paleolithic of northern Morocco: bifaces and other stone tools from the open air sites of Ammorene I and Ammorene II

Andrew W. Kandel, Knut Bretzke, Katleen Deckers, K. Felix Hillgruber, Mohamed Masri, Hannes A. Napierala, Nicholas J. Conard (Tübingen/ Damascus):
Environmental reconstruction across the Late Pleistocene to Holocene transition at Baaz Rockshelter, Damascus Province, Syria

Jadranka Mauch Lenardic (Zagreb, Croatia):
Small mammals (Insectivora, Chiroptera and Rodentia) from the Middle Pleistocene to Holocene strata of Vindija cave, NW Croatia

Petr Neruda, Martina Galetová & Gabriela Dreslerová (Brno):
Micoquian Bone Retouchers from Kůlna Cave, Czech Republic

Zdenka Nerudová & Petr Neruda (Brno):
Multiple Approach to Leaf Points: Morpho-technological and Use-wear Analyses

Martina Pacher (Vienna):
Revision of bone tools from Alpine cave sites – pseudotools or true evidence of Palaeolithic occupation

Guillaume Porraz (Tübingen):
Blade Production Technology in the Howiesons Poort assemblages from Diepkloof Rock Shelter, South Africa

Ulrich Simon (Vienna):
Saladorf, an Upper Palaeolithic Open Air Site in Lower Austria

Sibylle Wolf & Martina Barth (both Tübingen):
Exhibition Baden-Württemberg 2009 „Ice Age – art & culture“

Mohsen Zeidi, Rahmat Naderi & Nicholas J. Conard (all Tübingen):
Archaeological Survey in the Kazerun and Marvdasht Regions of the Southwestern Zagros Mountains of Iran

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Excursions

Wednesday, April 15th – Excursion I: Betalov spodmol Cave

After the visit of the Betalov spodmol cave:
Reception in **Trhlovca cav**e near Divaca with some snack and drink
(including presentation of the Slovenian TV-film about the Divje Babe flute)

Friday, April 17th – Excursion II: Divje babe and Križna jama *

(ca 8:30 am – 6:00 pm)
The excursion will be splitted in two groups:
GROUP 1 D.b. before noon, K.j. in the afternoon; GROUP 2 in the opposite way

1. Divje babe
Presentation Divje babe: guided by V. Pohar, I. Debeljak,
→ Between the visits is time for a snack (á 3,50 €)

2. Križna jama
Presentation Križna jama: guided by V. Pohar, G. Rabeder

** (Alternative program with rainy weather:* Idrija-Mine, Mala Triglavca and Škocjanske)

Saturday, April 18th – Excursion III: Krapina and Vindija (Croatia)

(ca 8:30 am – 6:00 pm)

1. Krapina
Presentation Krapina, cave and museum: guided by I. Karavanic

2. Vindija
Presentation Vindija: guided by I. Karavanic, G. Rabeder

Abstracts of Reports and Posters

Walpurga Antl (Vienna)

Adornments from Grub Kranawetberg and possible contacts at the end of the Pavlovian

The pendants and beads made from ivory from Grub/Kranawetberg together with mollusc shells from marine sediments of the region form an extraordinary assemblage of adornments which certainly has its parallels in central and eastern European Gravettian sites – Dolni Vestonice, Pavlov, Kostenki - but also shows a series of singular forms. The big number of objects allows presenting a set of adornments which might be regarded as a sort of fingerprint of groups using the place. The choice of material, the way of production connected with the invested labour depend on personal or group decisions. As a consequence comparable features in other sites might be regarded as an argument of relations or at least contacts between groups. Together with raw material procurement, dwelling structures and singular objects a network of intersite contacts can thus be established. The factor of individual choice makes adornments an important source for tracing human movements and the use of territory although the different state of preservation and documentation of old excavations as well as the danger of premature conclusions on a small data base must be taken into thorough consideration.

Michael Bolus [1], Angela Bruch [2], Miriam Noël Haidle [2], Christine Hertler [2], Andrew W. Kandel [1], Michael Märker [1]
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The Role of Culture in Early Expansions of Humans – A New Research Center

During the last two million years, the geographic range of the human species expanded in several waves from its original African homeland to encompass Asia and Europe – and possibly some waves led back to Africa. Of these hominin species, only anatomically and behaviorally modern humans, Homo sapiens sapiens, have been able to overcome the impediments imposed by the physical geography of this planet. Within a few tens of thousands of years, modern humans successfully colonized the globe, settling in Australia, the Americas and even the polar regions. Organisms are bound by specific ranges of environmental conditions to which they have adapted over many successive generations. As the spatial distribution of these environmental conditions changes over time, well adapted populations can follow an ameliorating climate up to its boundaries. However, deterioration of the basic conditions can lead to a narrowing of range, whether based on climate change, availability of food, number of predators, or perhaps even the appearance of epidemics and disease. Expansions beyond such boundaries are possible through either biological adaptation to the changing environmental conditions or through innovative cultural adaptation. In this regard, the knowledge of an organism's specific habitat – distinguished through climatic factors, diverse physical geographical and biogeographical attributes –, as well as the spatial and temporal development of that habitat, constitute the minimum requirements necessary to understand a species' expansion into new territory.

The scientific scope of the new Research Center, "The role of culture in early expansions of humans", which is funded by the Heidelberg Academy of Sciences and projected for 20 years, seeks to reconstruct the spatial and temporal patterns of the expansion of hominins in Africa and Eurasia between three million and 20,000 years ago. Other aspects of the project explore the routes of expansion, the biological mechanisms and the cultural potential with which our ancestors sustained themselves in new environments. The main goal is to explain the reasons for different hominin expansions. Implicit in the current

working hypothesis is the assumption that the influence of changing environmental conditions decreased as the importance of cultural and technological innovations grew.

The creation of a web-based database will lay the foundation for the scientific investigation of the earlier expansions of humankind. The database will integrate vegetational history, paleontology, climatic record and geophysical information into a model of prehistoric habitats which also encompasses archaeological and paleoanthropological perspectives. In addition to a detailed review of the existing literature, the project members will conduct new field work to collect additional sets of data. Pollen analysis, the investigation of faunal and hominin remains, and the examination of Paleolithic artifacts recovered from excavations and contained in museum collections will systematically expand the pool of data. The interdisciplinary data will be analyzed with the help of a Geographical Information System (GIS) to understand the spatial and temporal changes and their interdependency. The final results of the role of natural and cultural changes in early human expansions will be presented in a digital atlas of human and environmental history.
For further information see: www.roceeh.net

Mihael Budja (Ljubljana):

Who are the Europeans? From the 'dinarization' to the 'neolithization' of Europe.

The European population and genetic palimpsests are discussed in the contexts of Mesolithic and Neolithic trajectories. It is doubtless convenient to focus on the simplifying assumption that the dawn of European civilization relates directly to a Neolithic way of living and thinking that have spread en bloc from Asia Minor into Europe. The demic diffusion of Levantine farmers and the replacement of indigenous pre-Neolithic European population and their materialities were conceptualized in the context of the orthodox 'centre and periphery' perception of the genesis of Eurasian civilizations. It is unlikely that this scenario is actually how the transition to farming was initiated in southeastern Europe. The population geneticist suggest that the large-scale clinal patterns of gene frequencies in modern European population, whether based on the spatial distribution of the frequencies of classical markers or mtDNA and Y-chromosome markers and associated haplogroups, cannot be read as a marker of a single, time limited demic diffusion from the Asia Minor and associated neolithisation of Europe, but a multi period process of numerous small-scale, more regional population movements in all directions, replacements, and subsequent expansions overlaying previous ranges that happened during and after the Neolithic.

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Distribution, suitability and characterization of flint sources in the Marche Appennine: the Upper Esino Basin.

The Rossa and Frasassi gorges, in the upper Esino river basin, Marche Region, attracted human groups at different periods in the Paleolithic. Streams, caves and the strongly variable ecological surroundings

(GALDENZI and MENICHETTI, 1990; V.V.A.A., 1991) represent the main contextes exploited by Mousterians and above all Epigravettians, the evidence of which is dense and more complete than in earlier periods. Being the circumstances surrounding the peopling of this area already been described elsewhere (BROGLIO *et al.*, 2005; LOLLINI *et al.*, 2005; SILVESTRINI *et al.* 2005; ESU *et al.*, 2006; PERESANI and SILVESTRINI, 2007), we want to put in evidence in this contribution the importance of flint sources in supporting the complex lithic production activities accomplished at different times and places.

Flint is widely provisionable in many zones of the district under variable forms and types. The most suitable materials are nodules and blocks included in the densely stratified cretaceous limestones (Maiolica, Scaglia Rossa, etc.) (PASSERI, 1998), also easily provisionable as large pebbles on the Esino stream bed and other alluvial deposits. It has been suggested that due to its high-quality properties, Marche flint was used to equip early Epigravettian hunters during their large-scale circulation across the Po plain.

In the framework of a micro-scale field project financed by the "Parco Naturale Gola della Rossa e Frasassi", a systematic survey aimed to create a reference archive (Lythoteca) has been carried out. Flint has been sampled from limestone outcrops and from loose deposits, mapped and described using a set of variables (color, cortex thickness and morphology, thickness of the flint bed, micropaleontological content, etc.) and the relative flaking attitude.

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Nicholas J. Conard [1], Knut Bretzke [1], Philipp Drechsler [1], Andrew W. Kandel [2], Mohammad Masri [3] & Mareike Stahlschmidt [1]

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Paleolithic settlement dynamics in the Damascus Province of Syria

The *Tübingen Damaskus Ausgrabungs- und Survey Projekt* (TDASP) has conducted regional archaeological and geological surveys in western Syria since 1999. During nine seasons the TDASP team has identi-

fied over 500 Paleolithic sites in an area covering roughly 500 km². This is one of the largest data sets of its kind worldwide and allows us to apply a variety of new techniques to study Paleolithic settlement dynamics. Our work focuses on the region between the towns of Ma'aloula and Yabroud, approximately 50 km northeast of Damascus. The central survey area is characterized by a highly diverse landscape with elevations ranging from 800 – 2350 meters asl. Although the region today lacks permanent rivers or lakes, it does contain several major perennial springs that affect the organisation of human activities. The region also shows variable precipitation, which decreases from west to east as one moves toward the Syrian Desert. The abundance of flint also varies across the study region. Here we examine how the distribution of sites is affected by multiple environmental variables and consider how patterns of land use have changed from the Lower Paleolithic to the Epipaleolithic. Additionally, we further address methods for integrating the data from several excavated sites in the region with our survey data.

Döppes, Doris [1] , Pacher, Martina [1], Pohar, Vidar [2], Kavcik, Nadja [3] & Gernot Rabeder [1]
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[2] University of Ljubljana,
[3] Institute of Palaeontology, University of Vienna

Potočka zijalka – a Palaeolithic and cave bear site along the Slovenian/Austrian border

Geographical position of the site

The cave Potočka zijalka is situated in the area of Solčava, a village in the upper part of the valley Zgornja Savinjska dolina, on the road leading from Celje via the pass Pavličevo sedlo (Paulitsch Sattel) to Železna Kaplja (Eisenkappel) in Austria. The mountain ridge of Olševa stretches from west towards east. It consists of Upper Triassic limestone (Dachstein limestone) and belongs to the eastern part of the Karavanke. Beneath the western peak of Olševa (Obli kamen, 1883 m), at an altitude of approx. 1630 m is the entrance into the cave.

Cave description

Potočka zijalka consists of one single chamber, a 115 m long and 40 m wide cavity, sequence of sediments in the different excavation areas is very variable though. The ceiling's height varies between 4 and 8 m, in the chamber at the end of the cave it reaches up to 10 m (BRODAR, 1938; 1953).
Stratigraphy of the excavations 1997-2000 is compared to profiles that have been described in detail by BRODAR & BRODAR (1983). To the three stratigraphically different sectors of the excavation Brodar, a fourth sector, "north-east", is added (RABEDER & POHAR, 2004). Numerous radiometric dates indicate that Potočka zijalka was inhabited by cave bears between 35.000 and 26.000 years BP (POHAR & RABEDER, 2004). During this time also the "Kleinkies"-layer and the micro-mammal layer were accumulated and Palaeolithic man manufactured bone artefacts (bone points).

History of investigation

The cave Potočka zijalka was well known among people and mountaineers from both sides of the state border. One of the first publications about Potočka zijalka was the one by BRODAR & BAYER (1928).
Potočka zijalka (Land register number: 634) has been known since a long time. Grosz (GROSZ, 1930) dug out cave bear bones, while Srečko Brodar discovered the cave as a dwelling of Palaeolithic man (BRODAR & BRODAR, 1983). After the completion of excavations S. Brodar handed all cultural finds over to the museum in Celje. The palaeontologic material was deposited in the old building of the Highschool in Celje. Just before the end of the Second World War all excavated palaeontological finds were destroyed in an air raid.
To fill this gap, the Department of Geology from the Faculty of Natural Sciences and Engineering in Ljubljana and the Institute of Palaeontology from the University in Vienna carried out trial excavations in Potočka zijalka from 1997 to 2000 with the financial support of the Slovenian Ministry of Culture, the Faculty of Natural Sciences and Engineering in Ljubljana, the University of Ljubljana, and the

Academy of Sciences in Vienna in participation with the Institute of Paleontology from the University of Vienna (POHAR & PACHER, 2004).
Modern excavation techniques allowed an accurate determination of the findings and a correlation to former compiled profiles (KAVCIK, 2004). Some preliminary articles were published on different aspects of the Potočka zijalka, see PACHER (1998, 2000) and WITHALM (1999).

List of Fossil Faunal Remains from Potočka zijalka
The list of all taxa published by BRODAR & BRODAR (1983) and verified through fossil remains in Potočka zijalka, could be confirmed for the most part in course of the renewed excavations (RABEDER et al. 2004a).
In the assemblage of small mammals, in layer 8 after Brodar, remains of Soricids and Arvicolids predominate (RABEDER et al., 2004b). There were no finds of hares in the recent material. Remains of marmots were discovered in nearly all excavation areas of the cave and confirmed as faunal element of the Pleniglacial by one radiometric date (DÖPPES, 2004).
Cave bear (RABEDER, 2004) is the most abundant species among large mammals, followed by remains of wolves. According to BRODAR & BRODAR (1983) the few remains of brown bear belong to the Holocene but the recent investigations suggest Pleistocene remains as well. Cave lion is a newly described species (KROFEL, 2004), although the specimen had already been uncovered during the excavations by Brodar. A previous mentioned phalange was incorrect determined (PACHER, 1998). Concerning Mustelidae, *Gulo gulo* is first determined in the material from the recent excavation campaigns (DÖPPES, 2001).
Ungulata remains are rare, and only *Rupicapra rupicapra* is confirmed in the material of the renewed excavations. Musk-ox, recovered during the excavation Brodar, is a remarkable find in the Southern Alps. According to BRODAR & BRODAR (1983:189) it must have been imported by men and it does not belong to the Pleistocene Fauna of Slovenia (RAKOVEC, 1975:264).

Stone- and Bone Artefacts
The cultural remains which have been found at the Potočka zijalka during excavations 1997 - 2000 are described. In excavation areas 2 and 3 next to the eastern wall of the cave two fragmented bone points with a massive base came to light, which are ascribed to the Aurignacian tradition. The few stone artefacts, on the other hand, e.g. unguiform end scraper and backed bladelets, which had been recovered in the excavation areas and at the overburden in front of the cave, show a transition to the Gravettian.
Cultural remains from the excavation 1928 to 1935 have already been described in various publications (BRODAR, 1938; BRODAR & BRODAR, 1983). Brodar recovered 128 bone points with a massive base and one point with a split base at the cave entrance and at the back of the cave. Together with a preform of a needle (BRODAR & BRODAR, 1983:103–109), one bone point from the collection Grosz (BRODAR, 1994; BRODAR, 2000) and two bone points retrieved during the recent excavation campaign in 1997 in area 2 a total amount of 133 bone artefacts has been recovered (POHAR, 2004).
Srečko Brodar retrieved stone artefacts only at a part of cave entrance. The majority of them were found at the western wall of the cave mainly in cultural layer 7. In layer 3 he only found three unretouched flakes of chert. Only 80 intentionally manufactured tools were among 300 flakes of chert (lydit), quartzite and volcanic rock. They belong to blades, end scrapers, burins, tools with notches and scrapers (BRODAR & BRODAR, 1983:190–195).

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Burial Age Dating in Caves

Our current research project aims to determine valley incision rates on the Northern and Southern side of the Eastern Alps during the last few million years. Burial age dating provides a tool to date Pliocene and Pleistocene sediments. Quartz grains exposed to cosmic radiation at the surface accumulate ^{26}Al and ^{10}Be with a definite ratio of 6.8:1. When the quartz grains are buried, the different half-live of these radioactive nuclides causes the ratio to decrease with time. Caves are buried repositories for Quartz grains in clastic sediments and thus cave sediments can provide minimum ages for the cave genesis. The de-

crease of the mentioned ratio of the radio nuclides is the key to determine the time since the grain was buried.
In Slovenia, we sampled so far locations in the Julian Alps (Spodmol nad Planino Jezero), the Kamnik Alps (Snežna Jama), and the Huda Luknja gorge (Huda Luknja and Špehovka caves). On the northern side of the Alps we sampled sediments in caves in the Northern Calcareous Alps around Salzburg. Because dating of sediments as old as 5 Ma is possible, burial age dating is up to now primarily used in this kind of landscape development studies, but applications in the field of cave paleontology would be also possible, particularly for dating sites of Middle Pleistocene – Pliocene age.

Florian A. Fladerer & Tina Salcher-Jedrasiak (Vienna):

Permanent Gravettian encampments? Insights from the Krems-Wachtberg faunal remains

Excavations at the 26.6 ka BP Krems-Wachtberg residential camp site started in 2005. The most striking discoveries so far are a double human infant burial found in 2005 and a single infant burial found in 2006. These excavations are at the second site which are directed by the recent Austrian Academy of Science Prehistoric commission; the Krems-Hundssteig 2000-2002 campaigns were at the first, which was a peripheral camp area. Together with the data from a third site, which was a short salvage excavation also at Krems-Wachtberg in 1930, the archaeozoological and taphonomical results have the potential to provide a synopsis of site function and seasonality, although the ages of the horizons differ. From the more than 17,300 bone specimens available so far from the recent Krems-Wachtberg excavations, we have inspected 13,900. The material is highly fragmented, >2,000 compact bone "chips" originate from mammoth limb bone destruction and >8,100 specimens are burnt (>50% of NISP). Only 26 objects from mammoths are preserved to a degree of 30-100% of the complete bone, including a mammoth scapula used as the tomb slab sealing the double infant burial. >83% of the fragments have been assigned to mammoths, 7.3% to horses, 4% to reindeer, 2.5% to arctic and red foxes and 1.8% to wolves. Ibex, brown bears, arctic hares, wolverines, micromammals and birds are also documented. The high frequency of mammoth cortical bone chips within the encampment area contrasts with their low frequency at the Krems-Hundssteig AH3.4 dump area: the fragmentation of the marrow-containing bones occurred within the encampment; after marrow extraction, larger bone fragments were removed to the dump, leaving only small pieces in the encampment. The season at which the camp was utilised is indicated by teeth from three foals; these suggest that they died (hunted) between mid-September to mid-December. All seasonality data from the Krems-Wachtberg 1930 excavation also reflect a cold season. However, six of the nine death-data from Krems-Hundssteig site indicate hunting during the summer.

Austrian Science Foundation projects: P17258-G02 „Gravettienzeitliche Besiedelungsmuster an der forschungsgeschichtlich bedeutenden Position Krems-Wachtberg, Niederösterreich", P19347-G02 „Untersuchungen zur Sozialstruktur gravettienzeitlicher Jäger und Sammler anhand der neuen Siedlungs- und Bestattungsfunde am Wachtberg in Krems"

Florian A. Fladerer, Tina Salcher-Jedrasiak & Sandra Umgeher-Mayer (all Vienna):

Before the decline of the Mammoths: A reassessment of the 20 ka Epiaurignacian site at Langmannersdorf in Lower Austria

The Langmannersdorf Epiaurignacian site lies in the W-E directed Perschling valley, eight km from the Danube, in Lower Austria. Although small-scale excavations and sample collecting were undertaken between 1904 and 1920, systematic archaeological documentation and labelling of finds was commenced in 1919-1920 by J. Bayer. When W. Angeli published a monography in 1953, the site was already known

to have been essentially totally excavated. In 1997, one author (F.A.F) described the archaeozoological potential of the (partly injured) faunal material from the Langmannersdorf B area. This material was brought together again and restored as part of an Academy of Science Prehistorical Commission research project. A Masters thesis (S.U.-M.), mainly based on Angeli's previous study, re-examined archaeological features, including fireplaces, post-holes and a storage pit, and the typological characters as well as the raw materials of the 3,844 stone artefacts. New AMS-dating confirms the Full Glacial age at around 20.6 ka BP. An archaeozoological analysis (T.S.-J.) reaffirmed the mammoth as the main procurement resource, followed by reindeer. Thus this is the youngest known site in the Middle Danube region that was culturally based on mammoths. Wolf and fox bones are the next most frequent taxa identified, but no indicative butchering patterns have been detected. A unique feature is the nearly complete skeletons of two wolves found lying together with a parallel body orientation. From a taphonomical point of view, this can only be explained as being the result of an intentional burial. Seasonality data suggest that the site was occupied during the first half of the year; repeated camp use is indicated by splitting horizons.

Elham Ghasidian, Saman Heydari-Guran & Nicholas J. Conard (all Tübingen):

Ghar-e Boof: A new early Upper Paleolithic industry in southwestern Iran

The cave of Ghar-e Boof (cave of the owl), located in southwestern Zagros Mountains of Iran, was discovered in 2005 during the first mission of the Tübingen Iranian Stone Age Research Project (TISARP). Due to the promising condition of the cave, the TISARP team conducted two seasons of excavation. The excavated area of 18m² revealed over 37,000 lithic artifacts dated using radiocarbon between 37,000 to 33,000 BP.
In contrast to the other Upper Paleolithic assemblages of the Zagros Mountains and the whole of Iran, the lithic artifacts from Ghar-e Boof represent a diminutive lithic assemblage dominated by bladelets. Retouched bladelets compose nearly one third of the tools. 96% of the cores are bladelet cores which confirm the laminar technology and specialization on bladelet production at the site. The preliminary analysis of the lithic artifacts documents a new early Upper Paleolithic industry and cultural tradition in this part of Iran.

Ulrich Hambach (Bayreuth), Christine Neugebauer-Maresch (Vienna) & Leif Steguweit (Erlangen):

New insights in old profiles: Rock magnetic-based loess stratigraphy and new radiocarbon data from the Upper Palaeolithic sites of Krems-Hundssteig, Willendorf III–VI and Stratzing (Lower Austria).

Recent excavations at the sites of Krems-Hundssteig (2000-02) and Krems-Wachtberg (2005-08) allowed for detailed investigations of their Upper Pleistocene loess stratigraphy and provided consistent series of radiocarbon data (Neugebauer-Maresch 2008, Einwögerer submitted). In contradiction, knowledge about the old stratigraphic sequence of Krems-Hundssteig (1893-1904) with the famous Aurignacian collection was very poor. Drilling cores pulled in 2005 provide samples for direct correlation by means of rock magnetic records with the stratigraphic sequences from the new excavations at the Wachtberg site.
Magnetic property variations with depth/time in sedimentary sequences are mainly climatically controlled and therefore can serve as relative dating tool if the timing of palaeoclimatic variations is known independently (Hambach et al. 2008). Consequently, the rock magnetic variations with depth in the loess sequences under investigation can be taken as a palaeoclimatic record representing the climatic variations between drier and slightly more humid conditions at the transition from Middle to Upper Pleniglacial. Based on the magnetic records, a correlation of the loess at the Krems-Wachtberg site with the independently dated Greenland isotopic records is possible and suggests the general dating of the

loess to a time interval between approx. 20 to 40 ka (calendric age), covering Greenland interstadials (GI) 2 to 8 and Heinrich Events 3 and 4 (top) (Hambach submitted). Furthermore, the magnetic records reveal convincing correlation of the upper part of the old Hundssteig profile with the lower Wachtberg site sequence. The estimated age interval of the lower (old) Hundssteig sequence of about ≥39 to 43 ka (calendric age) is supported by recent OSL data from the Wachtberg site (Hambach et al. 2009) and confirms archaeological arguments for the *Protoaurignacian* character of its bladelet industry (Teyssandier 2003; 2008).

Additional data were recently gained at the open "show profile" of the Aurignacian site of Stratzing (Neugebauer-Maresch 2007). Based on rock magnetic data and loess stratigraphy we can correlate the sequence bed by bed with the Krems-Wachtberg site. This correlation places the cultural layers recognized at the "show profile" well below the stratigraphic level of the Gravettian cultural layer at the Wachtberg site (approx. 32 ka, calendric age). Ages of approx. 35 (KS1), 36-37 (KS2) and 38-39 ka (KS3) (calendric ages) could be assigned, respectively.

Last not least, loess sequences between Willendorf and Schwallenbach provide archaeological layers beginning with Initial Upper Palaeolithic industries ranging up to the LGM. The site locations Willendorf III to VI were named in 1908 by Hugo Obermaier who documented cultural layers in loess profiles along the new built railway line and collected some artefacts. New radiocarbon data were sampled out of drilling cores from the sites of Willendorf IV and V. The lowermost anthropogenic layer from Willendorf IV delivered two charcoal dates of more than 40 ka BP.

The new radiocarbon data in combination with detailed rock magnetic records from climatically controlled loess archives provide a self-consistent chronology for the Lower Austrian Upper Palaeolithic.

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Saman Heydari-Guran, Elham Ghasidian & Nicholas J. Conard (all Tübingen):

A geoarchaeological study of Paleolithic settlement systems and landuse in the Southern Zagros Mountains of Iran

We report on three seasons of fieldwork on the Stone Age occurrences in the Dasht-e Rostam and Basht regions of the Southern Zagros Mountains of Iran. This research forms part of the Tübingen-Iranian Stone Age Research Project (TISARP). The Dasht-e Rostam is a plain of within the Mamasani region with an elevation between 750-800 asl. This typical Karstic intermountain valley of the Zagros is bounded by mountains and forms one of the main natural routes between the Mesopotamian lowlands and Zagros Highlands. The adjacent Basht Region to the west constitutes a continuation of this large-scale geomorphological feature.
The TISARP survey has located 135 new Paleolithic localities, which are mainly located in the caves and rock shelters. Although we recovered Lower and Middle Paleolithic artifacts, the Upper Paleolithic recorded of the region is remarkably rich. In this study we used geoarchaeological approaches for the study of settlement systems and landuse by means of fieldwork, geological mapping and geographical information system (GIS).

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Ground stone tool taxonomy: An analysis of the MSA material from Mumba Cave, Tanzania

Ground stone tools have generally not been a central focus of Stone Age research in Africa. This is not the case in regions such as the Near East, where Wright (1992) has classified Epipaleolithic and Neolithic materials. Additionally, Adams (2002), using North American materials, has presented a general synthesis of analytical and technological approaches for studying ground stone tools.
In the context of the African Pleistocene, important work has been conducted by Leakey (1971) and Mora & de la Torre (2005) in Beds I & II in Olduvai. Clark's (1955) early work on stone balls or spheroids is also noteworthy. Ground stone tools of the Middle Stone Age (MSA), however, have received much less attention.
This paper presents a taxonomy for the ground stone artifacts from the Middle and Late Pleistocene. The main criterion used in this taxonomy is the visible usewear on artifacts. Hammering and pounding activities leave a very specific signature on the tools. One such characteristic is scarred edges on the surface of hammers. Similar observations can be made concerning grinding and similar activities.
Here we use this taxonomy for ground stone tools on the MSA material from Mumba Cave, Tanzania (Level V). Mumba Cave, which was initially studied by M. Kohl-Larsen in the 1930s, has one of the longest stratigraphic records of the Middle and Later Stone Age in East Africa. The stratigraphy of the site covers over 130,000 years, and the site has produced a large and diverse sample of ground stone tools. The collections from Mumba are ideal for examining questions of technological continuity *vs.* discontinuity in the Stone Age of East Africa.

Kurt Felix Hillgruber (Tübingen):

The Epipalaeolithic of Southwestern Syria

Between 1999 and 2007 the Department of Early Prehistory and Quaternary Ecology of the University of Tübingen conducted excavations in southwestern Syria at three sites (Baaz Rockshelters, Kaus Kozah

Cave, Ain Dabbour Cave), which provided numerous finds dating to the late Upper Paleolithic, Epipaleolithic and PPN (Conard 2006). These sites are situated in the Damascus Province of Syria adjacent to well-studied areas within Israel, Palestine and Lebanon. While typology plays an integral part in structuring the cultural sequence for this part of the Levant, technological studies are needed to better understand the successions, the affiliations and the integrity of numerous cultural entities currently in use (Olszewski 2006). Here I report the results of my doctoral dissertation focusing on changes in stone tool production over a period of 10,000 years. Data from the newly excavated sites in the Damascus Province are combined with results from the older excavations undertaken by Alfred Rust (1950) in Jabrud in the 1930s to rectify the existing taxonomic confusion associated with the Upper and Epipaleolithic of the region.

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Inge Hohenester, Leif Steguweit (both Erlangen), Gerhard Trnka (Vienna):

The lithic inventory of the Aurignacian site of Alberndorf, Lower Austria.

The Aurignacian lithic inventory and faunal remains from Alberndorf represent a short-term butchery camp, dated by ^{14}C to ca. 28 – 30 ka BP (Steguweit & Trnka 2008). Aspects of raw material procurement, refitted lithics and technological features of the stone implements are illustrated. The regular blank production from unipolar cores, carinated tools and burins display features of the Evolved (Typical) Aurignacian. Besides presenting arguments for the Aurignacian *s. str.* age from the lithic technology, the poster also focuses on some other aspects. First is the evaluation of the site formation process by the horizontal and vertical distribution of refitted lithic implements. Secondly, arguments for an Eastern European "Epi-Aurignacian" will be discussed. A special focus is on the regular production of retouched bladelets compared to other sites (Steguweit in pr.).

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M. Deva Jebb (Tübingen)

The Lower Paleolithic of northern Morocco: bifaces and other stone tools from the open air sites of Ammorene I and Ammorene II.

Data from the artifact collections made at the northern Moroccan sites of Ammorene I and Ammorene II as part of a long-term cooperative project between the *Kommission für Archäologie Aussereuropäischer Kulturen* of the *Deutsches Archäologisches Institut* and the Institut National des Sciences de l'Archéologie et du Patrimoine of the Moroccan Ministerè de la Culture are presented here as part of a November 2008 master's thesis. Both sites remain unexcavated and surface collections from 1998 through 2006 resulted in the collecting of 130 lithic pieces from Ammorene I and 137 lithic artifacts were amassed from Ammorene II. The sites are located within 8 km of the Mediterranean Sea (near to Nador) and the lithic

artifacts do not appear to have been found in situ, based upon the fact that each site is comprised of complex, undulating, alluvial watersheds that are presently agriculturally exploited. The results of the lithic analysis reveals that over 50% of the modified pieces of each assemblage are proto-bifaces or bifaces (i.e. handaxes, cleavers, picks) and at Ammorene I amygdaloid plan forms were selected for in proto-bifaces and bifaces, whereas at Ammorene II varied range of plan forms could be seen. Middle and Late Acheulean style artifacts are present at both sites although techno-morphologically the assemblage at Ammorene II appears to slightly predate Ammorene I's lithic collection. In being part of the Maghrebian Middle to Late Acheulean industrial complex, both assemblages are likely to be more than 100,000 years old but not more than 300,000 years. Given the rarity of such rich Lower Paleolithic sites in North Africa, coupled with the fact that these sites are the first of their kind to be found in northeastern Morocco, the research presented here fills several major gaps in the Paleolithic record of the Maghreb.

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Making sense of space in the Geelbek Dunes of Western Cape Province, South Africa

In 1998 the *Geelbek-Anyskop Ausgrabungs- und Survey Projekt* (GAASP) began surveying and excavating an open-air occurrence of archaeological and paleontological finds located near the shores of Langebaan Lagoon along the migration corridor of the Atlantic coastal plain, 100 km northwest of Cape Town, South Africa. For the next ten years, the GAASP team worked systematically in 23 of the 114 localities found within this mobile dune system conducting detailed geological, archaeological, environmental and taphonomic investigations. One of the most important aspects of GAASP was to identify the origin of the sediments in each deflation hollow and understand their relation to a broad spectrum of cultural remains dating from the Middle and Later Stone Ages. Finds included lithic artifacts, marine and terrestrial faunal remains, ornaments from marine shell and ostrich eggshell, bone tools, pottery and even colonial objects. Patterns of spatial utilization were analyzed using a Geographic Information System (GIS) to help unravel the complex depositional history of the different categories of finds in this open-air setting that was well-trafficked over long periods of time. The GIS was effective in separating out different time signatures, plotting the various parameters in space and reconstructing ancient land surfaces.

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Environmental reconstruction across the Late Pleistocene to Holocene transition at Baaz Rockshelter, Damascus Province, Syria

In May, 1999 the *Tübingen Damaskus Ausgrabungs- und Survey Projekt* (TDASP) discovered intact archaeological deposits in a rockshelter located near the village of Jaba'deen (Syria) along a prominent cliffline in the foothills of the Anti-Lebanon Mountains, 50 km northeast of Damascus. The site was named Baaz Rockshelter, and during the autumns of 1999, 2000 and 2004, TDASP excavated an area of about 18 m^2 to a maximum depth of over 2 m. The deposits unearthed during the excavations at Baaz reveal a detailed chronostratigraphic record spanning from 35,000 to 4,000 BP and a wide array of cultural remains from the Upper Paleolithic, Epipaleolithic and Neolithic periods. The transition from the mainly geogenic deposits of the Late Pleistocene to the anthropogenic deposits of the Holocene is marked by an

Epipaleolithic feature, the first documented Late Natufian house in Syria. The house is demarcated by an oval ring of large limestone blocks about 3 m in length, with a packed clay floor, tube-like mortar and built-in stone fireplace. Here, we discuss the environmental implications that stem from the analysis of botanical samples and faunal remains. We correlate the environmental data with the archaeological sequence and discuss the effects that changing climate had on the transition from hunter-gatherer economies of the Upper Paleolithic through the advent of sedentism and agriculture during the Epipaleolithic and Neolithic.

Jadranka Mauch Lenardic (Zagreb, Croatia)

Small mammals (Insectivora, Chiroptera and Rodentia) from the Middle Pleistocene to Holocene strata of Vindija cave, NW Croatia.

Fauna of Vindija cave, well known Croatian paleontological, paleoanthropological as well as archaeological site, which is situated in the region of Croatian Zagorje (NW Croatia; 46°18' N, 16°14' E, 275 m above sea level), has been continuously investigated from 1974 till today. The cave is a single hall about 50 m long, 25-30 m wide, and 20 m high. Approximately 12 m high stratified deposits, mostly excavated from 1974 till 1986, are divided into 13 layers/sublayers and/or complexes – from the youngest A (OIS 1/Holocene) to the oldest M (OIS 6/end of Middle Pleistocene). During last 35 years many animal taxa have been determined and analysed: Mollusca, Pisces, Amphibia, Reptilia, Aves and Mammalia (including Insectivora, Chiroptera, Lagomorpha, Rodentia, Carnivora and Ungulata) (Malez & Rukavina, 1979; Malez & Ullrich, 1982; Honauer, 1997; Paunović et al., 2001; Mauch Lenardić, 2005, 2007; Miracle et al., in press, and references therein). Fossil to subrecent/recent small mammal remains have been found in all 13 strata. Different taxa of Insectivora, Chiroptera and Rodentia have been proved on the base of approximately 2.500 selected bones and teeth, and determined as 26 species and three groups of species. Numerous skeletal (mostly postcranial) parts have been determined only on the generic or higher taxonomic levels. Morphometric analyses of smaller part of the Chiroptera specimens from the layers B and D have been made by Honauer in 1997. During the last decade for the first time detailed morphometric investigations have been undertaken on the vole (Arvicolidae) selected dental material (Mauch Lenardić, 2005, 2007). Other small mammal taxa have been only preliminary determined and listed.

Rodents are represented in all strata, in the contrast to the insectivores and bats which have not been found in all stratigraphic units. Because of the uncertain determination of bat species *Eptesicus nilssonii* (Malez & Rukavina, 1979) this species should be removed from the faunal list. The same concerns vole species *Microtus nivalis* (Malez & Rukavina, 1979), which were not evidenced in the arvicolid sample. Thus, the faunal list of this locality has been partly changed and updated.

Determined insectivores, bats and rodents approve that during Late Pleistocene prevailed more or less continental temperate climate, and that the forest cover was developed in lesser degree than today in the region. Scarce specimens from older strata (OIS 6) do not allow more precise conclusions and reconstructions of the climate conditions in the site vicinity during the end of Middle and beginning of Late Pleistocene. All taxa, except root vole (*Microtus oeconomus*) and alpine marmot (*Marmota marmota*) are the members of recent fauna of the Vindija cave surroundings, and the adjacent areas as well.

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Andrej Mihevc (Postojna, Slovenia)

Claw marks and footprints of the cave bear from three caves in Slovenia

Bones of the cave bear (*Ursus spelaeus*) or polished rocks are known from numerous caves in Dinaric and Alpine karst in Slovenia, while footprints and claw marks preserved in soft cave sediments were not known until recently. Here we describe till now discovered traces from three caves.
Traces of cave bear were discovered in Račiška pečina cave in small side passages about 250 m from the entrance. Cave bears were touching the walls and the end of the clay filled passage. Shallow foot prints and clear claw marks are preserved, indicating large animals. Besides that there are also scratches preserved on rock, flowstone and numerous polished rocks.
In Postojnska jama cave footprints are preserved in a narrow, partly clay filled passage in Tartarus, that is now accessible only by ladders. While climbing the steep face of clay fill bears leave many large and deep claw marks. Scratches are preserved also on the surface of the rock. In upper, horizontal part of the passage, there are some foot prints of a smaller cave bear. The passage is today several km far from entrance, so we presume that the bears came to cave through entrance that is now filled.
In Markov spodmol cave, which is at a moment active ponor cave the claw marks are preserved in a large chamber about 300 m from the entrance. There are only three claw marks preserved, the rest were eroded by the flood water of the sinking river. The marks were made by a smaller animal.

Andrej Mihevc (Postojna, Slovenia)

Cryoturbation of the sediments at the cave entrances – case studies from Skednena jama, Potočka zijalka and Bestažovca cave

Clastic autochthonous cave sediments, boulders, gravel and finer particles are in caves often locally displaced and arranged in different sediment structures and relief forms. The most important and distinct are features caused by cryogenic processes. They are formed by cyclic freezing and thawing of the water in the sediments. These processes were not limited only to Pleistocene cold climates or on caves in high altitudes. Cryoturbatic features are best expressed in vicinity of the cave entrances, but sometimes we can find them deep in the underground.
We observed and measured recent cryoturbatic ground movements in caves in Skednena jama 450 m a.s.l., and cave Bestažovca at 483 m and in Alpine cave Potočka zijalka at 1630 m a.s.l. In all three caves cryoturbation influenced also the formation of the archeological layers.

Cryoturbation develop due to increasing of the volume of the sediment when it freezes and thus expands its volume. This causes the upwards mowing of the whole cave floor. In Skednena jama seasonal upward movements from 5 – 10 cm in vicinity of the dripping water over 20 cm were measured. Vertical movements are also causing horizontal shifting of the particles. This process leveled the whole cave floor bottom to even dip.
In Potočka zijalka cave there is difference in the cave floor morphology between frozen and unfrozen part of the cave. In the inner, warm part of the cave, there is no patterned ground or traces of other cryoturbatic disturbances. On the floor in freezing front part of the cave, patterned ground developed too, which means that the whole sediment body together with prehistoric artifacts also mixed and moved. Archeological layers were not formed only by simple frost shattering of the ceiling and walls that covers the archeological remains with new rubble but mostly by movements caused by cryoturbation in uppermost, active layer of the cave floor.
The cave Bestažovca is accessible through vertical entrance. In a depth there is a horizontal passage which floor is covered with rubble that was cryoturbated and arranged into patterned ground and leveled to even dip. This part of the cave was accessible s through horizontal entrance, because there are remains of ashes and fireplaces. Later the entrance was closed by cryoturbated talus cone in which are numerous pieces of broken Neolithic pottery, making the datation of event possible.

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A micromorphological study of Middle Stone Age bedding, hearths and site maintenance at Sibudu Cave, KwaZulu-Natal, South Africa

Micromorphological analysis of anthropogenic deposits at the Middle Stone Age (MSA) site of Sibudu provides evidence for different activities, including construction of hearths, sweep out of hearths, construction of bedding, and burning of this bedding. This study provides a deeper understand of how MSA people lived at Sibudu and also provides a context for evaluating other studies at the site relating to archaeobotany, archaeozoology, anthracology, paleomagnetism, and studies of ochre.

Werner Müller (Neuchâtel)

Bilzingsleben - the faunal remains of the recent excavations

The three areas excavated from 2004 to 2007 yielded rather different numbers of faunal remains. Area B with 6 m^2 is the richest with 1880 finds, followed by area A with 10 m^2 and 478 finds and area C with 9 m^2.and 204 finds. All species present are, as one would expect, already attested for the main area of approximately 2000 m^2 of the older excavations. In terms of Numbers of Identified Specimens (NISP), the rhinoceros and the red deer are the dominant species followed by the beaver, bear, elephant, bison and horse. The primary objective of the archaeozoological analysis was to contribute to the general study of the site formation processes. It can be shown that the elongated tilted bones are oriented in precisely the same way as the other finds, namely towards the downward slope of the find-bearing horizon. The faunal material, therefore, corroborates the interpretation as a gravitational mass-flow deposit. Since parts of former palaeo-land surfaces have been mixed with different sediments it does not come as a surprise that a considerable number (174) of bones bear traces of stone contact. However, although a small number of unequivocal cut marks produced by flint tools were observed, a further analysis of all traces is necessary to establish their origin unambiguously.

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Living floors or Dumping Areas, Paleolithic Burnt Bone Layers and other Features from Hohle Fels Cave, SW Germany

Thick layers of burned bones and large lenses of combusted material belong to the characteristic features in several caves in the area of Blaubeuren in the Swabian Jura, namely Geißenklösterle, Brillenhöhle, Sirgenstein and Hohle Fels. All of these features lack the clear structure of fireplaces. Schiegl, Goldberg et al. interpreted the features at Hohle Fels as dumping area of combusted materials.
During the last years the database for the Hohle Fels excavation has expanded, improving the three-dimensional analysis of the excavated area by GOCAD.
In this study a three-dimensional plot of the distribution of burnt bone at the site of Hohle Fels is combined with results from micromorphological analysis to filter out distinct layers and features containing high proportions of burnt bone. There appears to be three distinct concentrations of layers of burnt bone: one in the Gravettian layer 3cf, one in the Aurignacian levels, and a third in the Middle Palaeolithic horizons.
The distribution of combusted material will be compared with artefact densities, with faunal distributions and with their re-fittings.
This integrated study addresses anthropogenic site formation processes, pyrotechnology, intrasite settlement dynamics, and occupational intensity from the Middle Paleolithic through the Gravettian.

Petr Neruda, Martina Galetová & Gabriela Dreslerová (Brno)

Micoquian Bone Retouchers from Kůlna Cave, Czech Republic

The grant project GAČR 404/07/0856 is focused on the research of the fragmented animal bone material that shows traces of human manipulation. We distinguished retouchers with clear marks of lithic tool production. They are relatively abundant in the Micoquian layers in Kulna Cave and therefore we can attribute them a statistic significance.
It is interesting to note that fragments of heavy bones were prefered for retouchers. Weight and metric comparison attest a certain degree of standardisation. Such process is reflected by lithic technology in Kulna Cave where we noted low variability of discoid method (in comparison to Taubachian layers) as well as the developing of blade technology that produces more predetermined supports (Neruda 2003, 2005).
This year we will compare our results with the Taubachian assemblages from the same cave, where we have described also a lot of retouchers. It will be interesting to see the degree of standardisation that is lower in the lithic technology.
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Zdeňka Nerudová & Petr Neruda (Brno):

Multiple Approach to Leaf Points: Morpho-technological and Use-wear Analyses.

The Szeletian contains a very special tool type – a leaf point. Most of studies compare rather the geographical frame and disturbation of the different groups with bifacial tools (most recently *Flas 2008*) but evaluation of the leaf point variability in the Szeletian is still missing. Study of the morphological variability of leaf points can be carried out in several ways but it is clear we need the description of shape to be as precise as possible. We usually measure several values and we store them in databases. Comparison of such data is difficult. Digital photography and application of evaluative software mean new advantages. Such approach is used for the 3D analysis of bifaces, for instance, but expensive equipment is indispensable (*Grosman - Smikt - Smilansky 2008*).
Within the frame of a grant project in collaboration with the Faculty of Electrical Engineering and Communication of Brno University of Technology, we created a new specialised software which can be used with a common digital camera. This software converts an artefact photo to the continuous contour that is possible to analyse by mathematical and statistical methods. Dimensions (length, width, thickness, perimeter and area), centre of gravity and the angle of point are measured and stored in a database table. The programme includes statistical analyses. Obtained data complete features which cannot be measured by a digital picture analysis such as a size class (circles with difference of 2 cm), an implement type (a leaf point, a leaf point type Moravany-Dlhá, a point à face plane, a Miškovice point, bifacial tools, a Micoquian backed knife, unifacial tools, a bifacial backed knife, a leaf side scraper), a technological level of the production phase (semi-product, final product, repaired product), an artefact cross section examined at ¼, ½, ¾ of length, a longitudinal section of the item in relation to its axis, a type of retouch, location of retouch (a1 – unifacial on the edge, a2 – unifacial on one surface, b1 – bifacial on two edges, b2 – bifacial on two surfaces, c – combination of one edge and one surface) and point shape (according to *Chabai–Demidenko 1998, Fig. 3.1*). All attributes are chosen to help with the definition of the artefact shape.
A morpho-technological analysis is rather a static system and new approach is necessary to reconstruct the leaf point life. According to ethnological studies, we understand leaf points (and bifacial tools too) as universal artefacts that could be both cores and tools and thus they were suitable to carry on long distance movement of the Pleistocene population. For this reason, determination of raw material used for production is one of the most important tasks. We used a microscopic method with water immersion. A use-wear analysis focusing on reutilisation is another option to reconstruct the „life“ of a leaf point.

Complete, non-fragmented pieces from Jezeřany I, II and IV, Vedrovice V, Moravský Krumlov IV, Ořechov I and II and Želešice I, were used for the primary comparison. 225 artefacts were compared in total. The software for the picture analysis has not been finished yet and thus our preliminary results are based on the additional features.
Semi- and sub-leaf points are the most common on examined sites. They differ in the degree of modification of the distal segment which can be worked into a sharp point (type B) or a rounded edge (type E). The proximal segment is rounded in both types; in type E it is wider than the distal segment. B type is documented in 28 % of cases and type E in 18,2 % (*Nerudová–Dušková in press*). Another common point type is designated as ”A shape” which means that the distal and proximal segments are shaped into a sharp point, reminiscent of the shape of a willow leaf (willow-leaf point; 12,4 % in total). This type was very common in Jezeřany II, IV Moravský Krumlov IV and Ořechov II assemblages but it occurs on all investigated sites. As these leaf points were long and thin, the edges are rarely undamaged. We can summ up the shape variations of leaf points as varying from relatively ”shapeless“ forms (not indicating future shape) to well-shaped items (clearly shaped and finished). Irregular or ovoid intermediate items are present and, as on other sites, they represent various unfinished items or different stages of the reduction process (see *McPherron 2003*, 57).
Larger points predominate over smaller forms on the workshop site Moravský Krumlov IV (a reverse ratio is common on other Szeletian sites). The finding of a small number of complete leaf points documented at MK IV corresponds to the site function – a leaf point workshop. We have to point out again

that the "complete" points on this site were either conjoined by us or they were clearly unfinished. The small size of bifacial artefacts known from many sites can result from:
- reduction in mass due to their use and subsequent reutilization,
- the initial small size of the blank,
- different functions.

A tool reparation is difficult to capture in the *chaine opératoire*. It can be distinguished by a detailed analysis of negative surfaces whose edges and orientation are gradually obliterated during the tool recycling process (*Pastoors 2000*, 247). This can be a common problem in surface collections. For this reason, we focused on reparation traces which are clearly demonstrable by refitting; in several cases we were able to reclassify some items as repaired, even broken artefacts where thinning strokes were directed from fracture surface to one or both sides with preserved negative bulbs and same patina as the rest of the tool.

Reshaping due to reutilization leads to changes in artefact size and shape which, in some cases, can lead to type reclassification (e.g *Dibble 1988*; *1995*, 300). The assemblage composition may then appear inhomogeneous and may cause that the different artefacts in the same assemblage are classified as culturally or chronologically separate (sometimes reasonably; *Vencl 2007*, 59).

Based on preliminary conclusions, we infer that the shape and metric variability of studied leaf points are determined by the level of use; it means the number of reutilization cycles and the size of the initial blank. The most common shapes are semi-leaf and sub-leaf forms with rounded bases or even proximal ends which probably resulted from reparation of damaged or blunted tip(s). The primary aim of fasonage is a point sharpened from both sides made by fashioning of ovoid or irregular shapes. Leaf points were multifunctional tools whose social status tends to be overemphasised in the workshop region of Krumlovský Les.

The use-wear analysis was performed on selected artefacts from two excavated stratified Szeletian sites: Moravský Krumlov IV-3 (17 pieces) and Vedrovice V (29 pieces). Raw material included chert (Krumlovský Les), radiolarite and flint. Possible use-wear traces were identified on 1 piece from Moravský Krumlov and 16 pieces from Vedrovice.

The traces were interpreted as hide processing (transversal motion) on one piece from Moravský Krumlov and one piece from Vedrovice. Other 2 pieces from Vedrovice were used for scraping undefined materials of soft and medium hardness and might have also been used for hide processing. It was not possible to interpre them more precisely due to the presence of a thick patina on the tool surfaces. Another relatively common trace type, which probably resulted from use-wear, was located on the tips of some leaf points (7 pieces from Vedrovice). It probably originated from dynamic activities. However, as no impact fractures were identified on these pieces, the limited degree of polish might also origin in post-depositional factors. Two pieces showed faint longitudinal traces of contact with unspecified material of soft or medium hardness (2 leaf points from Vedrovice V). Three pieces displayed traces of boring/piercing with material of medium hardness (2 leaf points from the Vedrovice collection and 1 from the Moravský Krumlov set). Finally, two pieces displayed undeveloped traces from undefined materials.

The results of the analysis confirm that both sites had different archaeological contexts and functions. In addition, the results show that the leaf points, defined as a single typological group, must be understood as multi-functional tools. It can be assumed that the traces originating in working meat/hide or soft vegetables might have been lost or underestimated due to the high degree of patination on most of the analysed pieces.

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Zdeňka Nerudová & Petr Neruda (Brno):

Moravský Krumlov IV – A New Multilayer Palaeolithic Site in Moravia (Czech Republic).

The site of Moravský Krumlov IV lies in the Krumlovský Les (Krumlovian Forest) region which is well known for occurrences of raw material and extraction of a particular type of chert named after it. It is very hilly terrain, some 40 km south-west of Brno, with an axis running SSW-NNE.
Quaternary sediments, more than 10-metre thick, are deposited on one of the eastern rib in the Krumlovian Forest, near prehistoric mining area VI (Neruda–Nerudová–Oliva 2004). A Palaeolithic site was discovered on the edge of a deep Late Pleistocene valley (315–325 m above sea level). The first finds, which can be linked to the site, were recovered in 1999 by M. Oliva on the northern side of the track; they made an interesting assortment of 5 pre-cores and 2 flakes.
Partial deforestation of the surrounding area in 2000 resulted in local erosion of surface sediments and exposition of patinated artefacts. Subsequent archaeological excavations in 2000–2004 yielded 4 Palaeolithic layers in three sectors IV-1, IV-3 and IV-4, which (based on the most recent data) belong to the time period between 150 and 35 kyr BP.

Stratigraphy of Sector MK IV-1

We gained basic knowledge of the site stratigraphy in sector IV-1. The upper parts were extensively disturbed by a recent hollow way to a depth of approximately 2 m and it prevented the correlation of upper layers between sectors IV-1 and IV-3. The continuity of layers is affected by recent hollow way and by erosion of the valley slope facing south. As a result, the upper part of stratigraphy is preserved only partially in remnants. The typical stratigraphic complex of sector IV-1 consists of the following horizons:
A – upper humic horizon
B – silty dominated residuum
C – Holocene B-horizon with first patinated artefacts at the bottom of the sediment (cultural layer 1),
D – remnant of loess reworked by bioturbation (archaeological layer 1 in the upper part of the sediment),
E1 – reworked paleosol of rusty brown colour – archaeological layer 2,
E2 – fossil soil B-horizon of yellow-brown colour,
F – Ca-horizon with weltered zones of a soliflucted soil sediment,
G – loess,
H1 – first weakly developed soil,
G2 – loess,
H2 – second weakly developed soil,

I – teworked and redeposited loess with chert rubble, granodiorite detritus and $CaCO_3$ concretions (archaeological layer 3),
J1 – remnants of a distinctly brown soil sediment and calcareous horizons,
J2 – a soil sediment of a distinct brown colour,
K1 – a rusty compact soil/soil sediment (7,5-10 YR 5/6), documented only in boreholes,
K2 – the same sediment with admixed detritus, it grades gently into loess.
Archaeological horizons 1 and 2 in probes 10/E, 10/F and 10/G were clearly separated by a 20-centimetre culturally sterile sediment layer. Layer 1 is situated in loess D (partly changed to the Holocene B-horizon – sediment C). Artefacts of layer 2 are contained in soil sediment E. The combination of the effects of erosion and bioturbation is reflected in the distribution lines of refitted artefacts.

Stratigraphy of Sector MK IV-3
Stratigraphic sections of up to 10 m in length were gradually assembled and they became the reference profiles for the entire area of Moravský Krumlov IV (*Fig. 1*). The Holocene complex A–C thickness reaches up to 60 cm. The underlying bioturbated layer of loess (D) gradually changes into the first fossil soil complex, which consists of several horizons in this sector, separated by thin slabs of precipitated $CaCO_3$ with increasing presence of detritus and small chert rubble at the base of each subhorizon. The archaeological layer 0 covered the whole sector in the upper part of this soil between the first detrital layer (in the sediment E) and the transitional zone of sediments D and E. A rib of a young mammoth or rhinoceros was found lying over the entire thickness of the archaeological layer. The lower part of this complex consists of a soliflucted horizon (F) with distinctive fragments of a fossil soil penetrating into the lower loess (G1).
Loess complex G is internally separated by a weakly developed soil (G2) differentiated from the loess by its violet hue. The transition between loess G3 and this uppermost level (H) of a second complex of fossil soil sediments is very gradual. Underlying sediment CH (archaeological layer 2) is subdivided into three horizons in this northern part of the sector. The uppermost level, i.e. underlying sediment H, is composed of a dark brown to black soil sediment with chernozem components. It also makes up the main substratum of horizon CH2, which is characterized by rusty stains of soil sediment – Albeluvisol. The depositional sequence has not been determined yet. The transition is very gentle and fossil roots from the base of sediment CH2 cut through both horizons CH/I and I, although macroscopically sediment CH/I is more similar to the superposed sediment CH2.
The underlaying sediments were documented only in the depth probe in squares 10–11/K. A Ca-horizon (J) is sharply separated from the overlying soil I. Further down it gradually changes to horizon K, which is rather difficult to interpret. It consists of soil sediment blocks which are divided by criss-crossing fissures (wedges) filled with calciferous crusts. The number of soil fragments decreases at the base, where they merge into the loess. Detrital loess sediment L should represent the equivalent of the macroscopically identical sediment in sector IV-1, which contains artefacts of layer 3. The underlying layers comprise the third fossil soil complex (sediments M1, M2, and N). It is composed of fragments of a soil sediment of strong brown colour with calciferous crusts separating the layers. The borehole documented a Ca-horizon and a loess deeper in the profile but the base of the Quaternary complex was not reached.

Defining Archeological Horizons
Interdisciplinary analyses determine 4 archaeological layers and hints of human presence in other layers:
- burnt bones in soil sediment M2 in squares 10–11/K (sector IV-3). Chronostratigraphic position: older then 150 kyr BP; *Pinus sp.* dominates.
- **archaeological layer 3** in sediment l. OSL data: 151,400±13,800 BP (*Rhodes et al. in prep*). The oldest archaeological layer was defined on the presence of stone chipped artefacts in reworked loess identified for the first time in sector IV-1. It was just here where 43 classifiable and anthropic handled objects and redeposited rock pieces were found on an area of 8 square metres. The occurrence of findings was not high in layer 3 and it does not usually exceed 10 artefacts per square metre. The finding horizon is thick approximately 0,75 m but the most artefacts are deposited in a part thick 0,35 m only. In such small space it is unfortunately not possible to assess even contingent spacial structures. Waste quantitatively dominates over determinated blanks in the industry; cores are also present in significant number. Tools

were identified as culturally unconvincing items as they are various types of denticulates and localy worn out flakes. All artefacts are made of local chert type of Krumlovsky Les. Support production was based on reducing flakes from cores which show traces of two contradictory reduction strategies – discoid and Levallois.
- reworked sediment J/K in squares 10–11/K (sector IV-3) with 23 small fragments of burnt bones, charcoals of *Pinus sp.* dominate.
- **archaeological layer 2** in sediment E of sectors IV-1, IV-3 and IV-4; probably a Micoquian workshop. OSL data: 115,300±8,800 BP (*Rhodes et al. in prep*). Vegetation remains contain *Pinus silvestris*, *Pinus cembra*, *Polypodiaceae, Quercus*, *Frangula*, *Picea/Larix*, *Salix*, *Pomoid/Sorbus*, *Juniperus* and *Rhamus*. The found stone industry is quite similar in all three sectors so we can assess the technology of stone raw material processing alltogether. In all sectors, waste was a dominant component (chips, fragments of flakes and pieces of raw material) exceeding 50 % of the set. Almost one fourth of the collection is represented by various blanks while the most often pieces were simple flakes with cortex remains of different size on their surface and flakes without cortex. Cores are significantly present mainly in sector IV-1; they make 16,9 % here. Several pieces documented even hammerstones in sectors IV-1 and IV-3 and there were bigger pieces of raw material with or without traces of testing. Overall composition of the industry covers all technological groups and demonstrates processing of the chert raw material on spot.
The technological analysis of cores may identify two leading production methods within a volumetric concept of support exploitation. The first one is represented by the discoid method in several variations. Two cases allowed to document existence of discoid cores *sensu stricto*. Subdiscoid cores are more common where we can unambiguously describe striking and reduction surfaces. The unifacial variety utilizes natural convexity of a pebble. Correctly organized exploitation enables to reduce such cores without preparation almost to the form of a small residue.
The extant range of tools is not much ample and it makes the cultural classification difficult. Side scrapers form a dominant part of the set exceeding 57 % (without fragments and blanks with traces of using). Beside simple types there are also offset, double and bifacial side scrapers. The mentioned bifacial side scrapers resemble side scrapers type Quina from the Micoquian collection of Kůlna Cave with a combination of various morphological features; a bifacial edge together with a thinned back, for example (*Neruda 2005*). An interesting point is the fact that two of those side scrapers are made of Cretaceous chert originating probably in the Bořitov region where Micoqiuan occupation dominates.
To deal with the issue of the bifacial method of artefact production, tool fragments are also interesting. Beside bifacial retouched side scrapers, there were also two fragments documenting presence of a bifacial edge in layer 2. It is difficult to say if they are side scrapers or remains of other bifacial tools; a bifacial backed knife for example. The tool set includes various types of notches and denticulates, local retouch and blanks with traces of using.
- **archaeological layer 1** (especially in the sector IV-1); probably a Micoquian workshop. OSL data: 97,200±7,300 BP (Rhodes et al. in prep). Charcoals (*Quercus*) and pollen (*Pinus silvestris*, *Pinus cembra*, *Betula*, *Salix*, *Ulmus*, *Asteraceae*, *Ranunculaceae*, *Galium*, *Poaceae*, Plantago, *Thalictrum*, *Cyperaceae*, *Saxifraga*, *Artemisia*, *Chenopodiaceae*, *Daucaceae*, *Sedum*, *Ephedra* contain both moderate and cold species and the possible chronological position is OIS 5c. The technological analysis is primarily based on the evaluation of artefacts from sector IV-1. The analysed industry contained almost all technological categories which indicates reduction of the local chert directly on site. Beside cores, blanks and tools, there are abundantly present also chips, waste and blank fragments. Pieces of raw material and hammerstones were also documented in the cultural layer. The percentage of cores is not significant (2,93 %). On the spot of the mentioned concentration tool, shaping and use of blanks for unspecified activities took place (blanks with local retouch and blanks with traces of using). Their number even slightly exceeds the core figure.
The found industry describes quite clearly two essential methods of support production – discoid and subprismatic. There are 41 pieces of preserved tools on which various local retouch and blanks with traces of using or fragments or retouched tool prevail. Beside bifacial tool, there are simple side scrapers and various notches and denticulates. No specific supports were prefered to produce a tool. Natural fragments of raw material even dominate in the case of side scrapers. Local retouches and blanks with traces of using are found on cortical blanks in most cases.

- **archaeological layer** 0 in sectors IV-3 and IV-4. ^{14}C dating is between 36,820–38,350 uncal. BP. Charcoals of *Picea/Larix* are present. During 2000–2004, archaeological horizon (designated as layer 0) was recovered in sector MK IV-3 and analyses of stone artefacts allowed to correlate them with the Szeletian. Besides numerous chipped stone pieces, we also found some bone fragments and charcoals. The total number of the lithic artefacts is 6,007 pcs. The composition of the preserved lithic industry corresponds to the site character where the majority of the debitage is represented by trimming flakes often coming from the fassonage of bifacial tools. Flake fragments (78 %) are the most common technological category. Cores and core fragments account for 0,39 % of the assemblage. Pebbles used as hammerstones and retouchers (0,14 % with use-wear marks) or the pieces stand for the raw material in 0,14 %. "Like" blades are represented minimally (only 19 pcs, i.e. 0,3 %). Retouched tools account for 1,2 % of the assemblage. Besides leaf points, other types (totaling 33 pcs.), include endscrapers, sidescrapers and various notches and denticulates. Use-wear traces identified by use-wear analysis suggest that domestic tasks may have taken place (for more details see the list of the retouched tools). As far as it was possible to determine, mostly flakes, one piece of a pebble and a core were used as a support (anvil?) for the tools. In the case of leaf points, it was not possible to find the original support in one third of all cases.
There were registered two, respectively three places in the surveyed area, where a chipped industries of small and bigger size were concentrated. Those places indicate a location where a prehistoric knapper was sitting and processing the stone raw material. Schemata of some refittings are shown on the plan of the surveyed area. Although the most common refitting sequences are objects broken into two pieces found within a single square, one representation of a refitted core is notable because its components were deposited in a line of five squares giving the impression that someone was working on this core while walking. A part of another refitting, distributed in a similar way, is associated with an artefact accumulation located in square 11/R and its surroundings.
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Boštjan Odar (Maribor, Slovenia)

Perceptions of the Landscape: The cases of Potočka zijalka and Divje babe I.

The following paper is concerned with middle and upper Palaeolithic perceptions of the landscape as indicated by evidence from two atypical Slovenian Palaeolithic sites, Potočka zijalka and Divje babe I. This is based on the unusual find contexts in these two caves, which both occupy outstanding positions in the landscape. This fact enables the interpretation of these two sites as centres of the cosmological worldview of Palaeolithic people in this region.
A collection of 125 exceptionally preserved bone points was found In Potočka zijalka. More than ten other bone artefacts such as the oldest known tubular needle or flute, made of cave bear jaw-bone, were found, as well as a large number of pieces of red pigment. The bone points were made of cave bear bone and were used as part of a composite hunting weapon. The hunting equipment of these people comprised spears, bows and arrows. 99'9 % of all animal bone remains in Potočka zijalka are derived from cave bear. There are no traces of animals that were hunted by human hunters. There are also no traces of bone point production. The fact that the points and the flute were made of cave bear bone indicates

an animistic relationship of people to cave bears. Caves offer shelter. Cave bears were born in the caves, they lived in caves and they did die therein.
On a symbolic level bone points represent the male principle and the cave the female principle. Bone points in the cave represent sexual intercourse between a god and goddess. The east-west orientation of the Olševa Mountain offers an answer to the question of the identity of these divinities. In the morning the Earth gives birth to the Sun. In the evening the Sun goes down and begins an intimate relation with the Earth as an adult male. This permits the rebirth of the Sun on the following day. A position in front of the cave entrance gives one the impression of standing at the centre of the world . There is, thus, clear evidence of the incorporation of animism into a geo-solar cosmological principle in Potočka zijalka.
The Divje babe I cave site is difficult to see from the Idrija valley. The toponym Divje babe means wild women In English. The cave entrance is oriented to the north and is hidden in woodland. The cave is visible only in winter from the Police plateau on the other side of the Idrija valley. Rare but important finds in from Divje babe I indicate that people only occasionally visited the cave. Fragments of bone points were found in the cave. The earliest example is dated to 115 000 years, whilst the latest dates to 40 000 years. However the most important context is one of several hearths in layer 8. The famous Neanderthal flute, 60 000 years old and made of cave bear bone, was found in this hearth. In close proximity two cave bear skulls were found together facing away from each other. The male skull was oriented to the west, the female to the east. Ivan Turk noticed a significant loss of cave bear canines in the occupation layers in the cave. He also noticed much higher fragmentation of cave bear skulls in the occupation layers in Divje babe I. Divje babe I did not yield many skeletal remains of meat-bearing animals that would have been of interest to human hunters.
The unusual site with the famous hearth in layer 8 could be a special place in the cosmological system of the people, who were visiting this cave. Intentional fragmented cave bear skulls and a significant absence of cave bear canines in the occupation layers may indicate an animistic relationship of people to cave bears. The bone flute was made of a cave bear femur. The Šebrelje plateau can be seen off to one side if one stands on the Police plateau and looks towards Divje babe I on the other side of the Idrija valley. An incredible sight can be seen from a particular position on the Police plateau. A natural rock formation in the form of a large vulva is visible directly below the cave. And this is exactly what Neanderthals probably saw. Two cave bear skulls, the male oriented to the west, the female to the east, were intentional oriented in an east-west direction. The female skull was oriented to the east, where the Earth gives birth to the Sun, whilst the male skull was oriented to the west, where the Sun goes down. These two cave bear skulls, positioned in the womb, show exactly the same geo-solar cosmological pattern, as that previously defined in Potočka zijalka.

Potočka zijalka and Divje babe I were centres of religious thought for people, who visited them. The position of these two caves in the landscape and the context of finds in the caves denote a common attitude of a special animistic relationship of humans to cave bears. At higher level, it is also possible to detect a geo-solar cosmological principle in both cases. A geo-solar principle is incorporated into cosmologies all over the world and is even deeply buried in Christianity.

Jörg Orschiedt (Hamburg/ Hagen)

The Blätterhöhle in Hagen (Westphalia): Preliminary report on the first archaeological investigations

The site Blätterhöhle in Hagen is a newly discovered cave site in Westfalia. The Cave was discovered during a speleological exploration in 2004. It was almost completely filled with sediments by the time of discovery. During the first small scale excavations by the speleologists human skeletal remains were found and reported to the responsible institutions. Since 2006 the archaeological excavations brought more human remains of at least seven individuals, animal bones and stone tools to light. The excavations inside the cave and especially close to the entrance from 2006 to 2008 resulted in the discovery of two fireplaces with activity zones. The place in front of the cave was identified as a crashed rockshelter.

First radiocarbon dating and the typological analysis of the stone artefacts indicate that the cave and the space in front were used towards the end of the early Mesolithic and the late Neolithic. During these two periods the cave was used as a cemetery. In the early Mesolithic around 8700 cal. BC a human skull cap and further isolated human skeletal remains were buried in the cave together with 3 boar skulls. During the late Neolithic a collective burial was deposited in the cave between 3600 and 3000 cal. BC consisting of several adults and children. A geophysical examination of the sediments in front of cave revealed the basis of the rock in 7 m depth. Therefore we assume a high archaeological potential of the site as well as reaching glacial sediments.

Jörg Orschiedt (Hamburg/ Hagen)

The Krapina case – new results on the question of cannibalism of Neanderthals

The human skeletal remains from Krapina of almost 900 fragments have been considered for a long time as a proof of Neanderthal cannibalism. Although this opinion was frequently criticised, the fragmentary nature and traces of manipulations on the skeletal remains were mentioned as evidence. Several investigations resulted in contradicting interpretations whether the condition of the human remains are the result of burial activities or ritual cannibalism. The re-examination of the skeletal remains was carried out in order to put a closer look to the breakage patterns and the cut marks. The revision of the inventory of human remains shows that certain skeletal elements like the facial skeleton, skull base, hand- and foot bones as well as vertebrae are underrepresented or missing. It seems therefore unlikely that the bodies were buried in anatomical connection. The investigation also proved that the breakage patterns were not caused by human activity. Although several bones especially the long bone diaphysis, clavicles and pelvis fragments display breakage patterns related to perimortem breakage like spiral fractures, any kind of human activity is absent. In fact the breakage is related to sediment pressure, particularly to rock fall, and carnivore activities. Damage on bones caused by carnivore activity is well visible by bite marks on long bone fragments and on Cranium 3. The study of the cut marks revealed serious doubt on their nature. The macroscopic investigation, however, showed that the traces are not consistent regarding their orientation and location with traces commonly related to disarticulation and dismemberment activities. Several cut marks show evidence for a recent origin.
The well known Cranium 3 exhibits possible cut marks on the frontal bone, which might indicate skinning activities like the removal of the scalp. Nevertheless the position and the small size of the marks fail to prove such an activity. A ritual behaviour might be a possible explanation.

Martina Pacher (Vienna)

Revision of bone tools from Alpine cave sites – pseudotools or true evidence of Palaeolithic occupation

Palaeolithic bone tools are reported from various cave sites of the Eastern Alpine region. In some places they provide the major clue for the chronological attribution of human occupation. Often pseudotools were included in the Palaeolithic bone tool assemblage. Some forms soon became refuted like the so called “Kiskevelyer Klinge” or button-like fragments. Flutes made from cave bear bones were heavily discussed. Nonetheless, for most of the sites a modern study and presentation of the whole assemblage is missing.
In course of a revision of the bone tool assemblage from Repolust-cave, Styria, proposed artefacts of other sites like Liegloch, Badlhöhle, and Mixnitz were examined, too. The aim of the study was to distinguish artefacts from pseudotools and to determine the nature and raw material use of true organic artefacts.

Pseudotools were mainly produced by carnivore action, rodent gnawing, abrasion, and corrosion, while organic tools were identified from antler, bone, and tooth. They provide evidence of human occupation at these sites during the Palaeolithic but also younger periods.

Clemens Pasda (Jena)

Bilzingsleben – Final report on the 2004-07 excavations

Bilzingsleben is a well-known mid-Pleistocene site in northern Thuringia (Germany). The site was excavated by Dietrich Mania from 1969 to 2002. His research on palaeontology, palaeobotany, archaeology and anthropology resulted in one of the most detailed accounts of a ′Holsteinian′ interglacial locale. In 2006, a museum with a large hall was built at the former excavation area. The well-known "Bilzingsleben collection", the material excavated during these 34 years, is now stored in new research facilities at the University of Jena.
Starting summer 2003, new excavations at Bilzingsleben have been carried out by archaeologists and geologists from the University of Jena. Three areas that are thought to be representative for the entire site have been chosen. The find-bearing layer, containing numerous rocks/stones, animal bones and flint/chert, is a sandy layer of 80 – 100 cm thickness, situated above a silt and below a rock travertine. The sediment does not show internal stratification but rather exhibits a vertically disordered mixture of small and large finds with gravel up to 50cm in diameter. The objects are distinctly oriented in a main direction throughout the layer. This indicates that the whole fine sediment moved together with larger and smaller clasts into a certain direction and that, therefore, the find-bearing layer has to be interpreted as a gravitational mass-flow deposit with mixing of different sediments (e.g. loess, sand, erratics, rock travertine clasts, fluvial gravels) with parts of former palaeo-land surfaces (e.g. slope debris, animal bones, wooden fragments). Another result of the new investigations at Bilzingsleben concerns the interpretation of the lithics: it became evident that between obvious non-artefacts and possible artefacts is a large grey area without clear boundaries. Since the site-formation process has been established as a gravitational mass-flow, the occurrence of artefact-like lithics with bulbs, edge-damage and notches can be easily explained. As a consequence has the role of Bilzingsleben - as a key site to define the so-called ′Lower Palaeolithic small tools′ - to be challenged.

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Andreas Pastoors (Mettmann):

Bladelet production in late Middle Palaeolithic sites Balver Höhle and Salzgitter-Lebenstedt (Germany)

The discussion about the significance of technological innovations in lithic production systems at the Middle to Upper Palaeolithic transition is characterised by constant changes. Differing interpretations of the significance of blades and bladelets demonstrate this dynamic process.
Examples of bladelet production from Balver Höhle and Salzgitter-Lebenstedt are discussed, each as a component of diverse lithic production systems. It becomes clear, that the technological knowledge of

efficient, economic core configuration (for the production of bladelets) existed already in the Middle Palaeolithic, but did not play a major role within the assemblages of the two sites. A possible explanation lies in the low residential mobility of Neanderthals and a disinterest in bladelets as blanks. Moreover, the presence of bladelet production in late Middle Palaeolithic assemblages is evidence of a high level of technological knowledge. Therefore the development of Upper Palaeolithic bladelet production does not document an innovative new stage in technical evolution.

Ljiljana Pavičić, Marta Mileusnić, Dinko Radić, Ljerka Marijanac (Croatia)

Sedimentological profile through Pleistocene-Holocene deposits of Vela spila cave, Croatia

Vela spila cave is one of the most important archaeological and paleontological sites in Eastern Adriatic. It is situated on the Pinski rat hill near the town Vela Luka on the island of Korčula, Croatia. Archaeological investigations in Vela spila cave have been going since 1949 and they have proved the continuity of human occupation of Vela spila through Palaeolithic, Mesolithic and Neolithic (Čečuk & Radić, 2005). First sedimentological research was conducted in 2002, when the western profile of main trench was described and the distinctive tephra layer, dated from 15 ka ago, found (Radić et al., 2008). The trench has been extended during the archaeological excavations in 2004 and 2006. Sedimentological investigations were taken in 2008, in order to gain more information regarding the formation of sediments, as well as paleoenvironmental and palaeoclimatic conditions during deposition. Four stratigraphic profiles of main trench were drawn, and more than 40 samples were taken for laboratory analyses.
Current investigations are based on detailed *sedimentological* (grain size analyses; microscopic analyses), *geochemical* (major, trace and rare earth element analyses; total sulphur and carbon determinations; carbonate and organic matter content, pH and electrical conductivity determinations) and *mineralogical* analyses (powder XRD analyses of bulk samples, as well as, XRD analyses of the random and oriented samples of clay fractions < 2 μm and cation exchange capacity determinations) of sampled fine grained sediment. Sedimentological and petrographical analyses of thin sections of carbonate clasts and grain size analyses will be performed on the samples of carbonate breccia. The laboratory analyses were concentrated on eastern profile called A-A' and here will be presented first preliminary results.

Profile A-A' comprises the whole range of Pleistocene deposits and the distinctive boundary layer between Palaeolithic and Mesolithic sediments. Most sediments are gravely-sandy-silt after Konta classification (Konta 1973), with abundant bone and coal content. The anthropogenic influence on sediment composition and structure is strong. Small fragments of charcoal and burnt bones, found in almost all sedimentary layers, as well as small carboniferous and clay lenses, found throughout the whole trench, probably represent ancient fire places. Lenses are concentrated defining a specific lenticular bed. Layers and thick lenses of very course-grained sediments (gravels and sandy-silty-gravels) contain recrystallised limestone clasts. These clasts are similar to those from cave walls, angular and platy in shape, with sharp edges. They are mostly remnants from the main rock disintegration and ceiling collapses, which had happened several times during the Pleistocene/Holocene period. Some layers comprise a great quantity of large animal bones and bone fragments. The boundary between Pleistocene and Holocene (Palaeolithic and Mesolithic) is marked with distinct matrix supported gravels. Limestone clasts and boulders have irregular shape and sharp edges and are very poorly sorted. Reddish-brown fine-grained matrix is concentrated mostly in the upper part of the bed. The layer beneath show great deformations because of the large limestone blocks falling and crushing into a soft fine-grained silty sediment bellow and causing the thin carboniferous and clay lenses to disturb and form deformation structures. This layer is recognizable in whole trench and marks a period of almost 5000 years without a human presence in Vela spila cave (results from the radiocarbon dating of sediments above and below that layer). Mineralogical content of sediment samples is represented by carbonates (calcite and dolomite), quartz, apatite (bones)

and sporadically by plagioclase and K-feldspars. Dolomite is found only in deeper part of the profile. Organic matter content vary between less than 1 to 10 wt. %.
Purpose of the current study is not only to achieve the goal mentioned in the introduction, but also to create a template for investigation of other similar caves in Croatia. These investigations are possible due to good collaboration between archaeologists and geologists.

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The end of the Neandertal age at Grotta di Fumane, Northern Italy: first results of the last three years field campaigns

This article presents the first results achieved from the recent excavations carried out at Fumane Cave, a key site in Northern Italy in which it is possible to explore Neanderthal behaviour and compare it with Modern Humans and the Aurignacian record. Extensive excavations of the late Mousterian layers (units A6 and A5) and the Uluzzian layers (units A4 and A3) have brought to light different types of traces ascrivable to the human occupation at the cave entrance. The evidence shows a rarefaction in the cumulation of human activity residues from the base to the top of this short sequence and suggests the site was variably used.

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Simona Petru (Ljubljana):

Palaeolithic art in Slovenia

Most of the Palaeolithic art objects in Slovenia are questionable. Best known and disputed is Neanderthal flute from Divje babe I, which could be the material reflection of early need or desire for sound and music creation. Later, in the Upper Palaeolithic sites, there are some samples of the creativity of Modern humans, which can be interpreted as visual art forms. In the lecture all possible examples of Palaeolithic art in Slovenia will be presented and evaluated. The emergence of art as form of communication will be discussed and the thesis why the expansion of the visual art was not possible until the Upper Palaeolithic, will be proposed.

Jordi Serangeli, Utz Böhner, Hartmuth Thieme (all Hannover):

The digging of the DB pillar in the opencast lignite mine in Schöningen – The Schöningen 12 II site

Since July 2008 preparations have started to excavate the last section of the opencast mine in Schöningen the so-called "DB-Pfeiler". This 300m wide and 1 km long segment is about 800 m to the north of the wild horse hunting location, where the wooden spears were found (Thieme, 2007). Within the "DB-Pfeiler" at a depth of 15m is a Pleistocene channel filled with organic sediments and remains of the Reinsdorf-Interglacial period (channel II). In 1992 H. Thieme excavated wooden objects, which were interpreted as grips for holding flint tools, along the southern site of the DB pillar. The excavations took place over more than 150 m^2.
The new excavations aim to continue the investigations in the same layers as in 1992, thus increasing the material recovered, but also increasing our knowledge of the channel, before the site is destroyed by the mining operations. In addition to a summary of the Pleistocene sites in Schöningen, we will give an account of the progress being made by the present excavations.

Der Abbau des DB-Pfeilers im Tagbeau Schöningen – Die Fundstelle Schöningen 12 II

Im Tagebau Schöningen hat seit Juli 2008 der letzte Abschnitt des Abbaus begonnen. Ca. 800 m nördlich des Wildpferdjagdlagers, dem Fundplatz der Holzspeere (s. dazu Thieme 2007), blieb bislang ein Steg von ca. 300 m Breite und 1 km Länge, der so genannte DB-Pfeiler, vom Abbau ausgespart. Durch den DB-Pfeiler verläuft in ca. 15 m Tiefe eine pleistozäne Rinne, die mit organischen Ablagerungen des Reinsdorf-Interglazials verfüllt ist. In der Endböschung des Südfelds wurden an der Basis dieser Folge bereits 1992 bei Ausgrabungen durch H. Thieme einige als Klemmschäfte interpretierte, bearbeitete Holzartefakte entdeckt. Die Grabungsfläche erstreckte sich über 150 m^2. Die neueren Ausgrabungen am DB-Pfeiler zielen zum einen darauf, die 1992 entdeckten Fundschichten wieder zu finden und die Ausgrabungen fortzusetzen, zum anderen soll der genaue Verlauf der Rinne geklärt sowie die Rinnenfüllung untersucht werden, um ein Maximum an Informationen vor der endgültigen Zerstörung zu dokumentieren. Neben einem Überblick über die pleistozänen Fundstellen des Tagebaus Schöningen soll auch der Fortlauf der Arbeiten geschildert werden.

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Ulrich Simon (Vienna):

Saladorf, an Upper Palaeolithic Open Air Site in Lower Austria

In the course of extended salvage excavations a Palaeolithic site was discovered near the village Saladorf in Lower Austria in 2004 (BLESL, HÄNDEL & HERRMANN 2005; EINWÖGERER & SIMON 2005). The new site is located on a promontory opposite to the well known Upper Palaeolithic settlement of Langmannersdorf (BAYER 1919-1920; ANGELI 195; MAYER-UMGEHER & SALCHER-JEDRASIAK in prep.).
Further research was done by the Prehistoric Commission of the Austrian Academy of Sciences (SIMON & EINWÖGERER 2008). Nearly the complete Palaeolithic inventory originates from one singular archaeological horizon. The raw material economy can be described as a local one and first analysis assign the lithic inventory to a Gravettian/Epigravettian tradition.
In contrast to other Upper Palaeolithic sites in Lower Austria the game is represented only by horse and reindeer. Half-year up to one year old horses indicate seasonality with an autumn or winter occupation (GALIK 2005).

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Astrid Slizewski (Mettmann):

Regional differences in the late Middle Palaeolithic of the Iberian Peninsula - Data sampling and uploading into NESPOS

A two years project initiated by the Neanderthal Museum in April 2008 and funded by the Gerda Henkel Stiftung investigates regional differences in the late Middle Palaeolithic on the Iberian Peninsula. Archaeological and anthropological data from more than 50 sites will be compiled in different formats (including surface scans, 6-faces and digital photos) and will be stored in the online database NESPOS. Special focus is put on late Middle Palaeolithic bone tools as well as Châtelperronian points, bladelets and bone artifacts which play an important role in the discussion of the transition from Neanderthals to early modern humans. It is assumed that these objects are diagnostic for regional differentiations on the Iberian Peninsula. The presentation gives an introduction to the topic and an overview of the methods used and of first results.

Yvonne Tafelmaier (Köln):

News from the Hönnetal – The case of the Middle Palaeolithic site *Volkringhauser Höhle (Germany)*

The small cave is located close to the well-known *Balver Höhle* in the Hönnetal / North Rhine-Westphalia. It has been discovered at the end of the 19th century and was eventually excavated in 1928 by J. Andree and K. Brandt. The inventory comprises finds of the excavation and archaeological material that came to light by an undocumented collection in the 1940s. Only the material of Andree´s excavation has yet been published (BOSINSKI 1967).
This paper presents the results of my M.A. thesis, which deals with the complete archaeological material, including about 300 lithic artefacts and 200 faunal remains. The first question that had to be answered was whether the two find complexes (*excavation* and *collection*) represent the remains of the same techno-cultural unit or whether they belong to different techno-complexes. A technological and typological analysis of the lithic artefacts comes to the conclusion that all finds belong to Middle Palaeolithic occupations. A matter of particular interest is the presence of three different operational schemata for the production of small blades and bladelets. It can be demonstrated, that these blanks, which are

traditionally linked with the Upper Palaeolithic, are within the range of Middle Palaeolithic technological knowledge. Faunal analysis and different aspects of the lithics (e.g. raw material, represented phases of the *chaîne opératoire* and tool frequency) allow a functional interpretation of the site. According to that, the small cave was occupied repeatedly by short-term visits of Middle Palaeolithic hunter-gatherers. AMS-dates of about 41.000 cal. BP place the Volkringhauser Höhle at the very end of the Central European Middle Palaeolithic.

Joanna Trabska (Rzeszow, Poland)

Red iron oxides in a perspective of Palaeolithic Societies: Potential sources in central Europe

Red iron oxides must have been a very attractive mineral material for Palaeolithic people and its application must have fallen outside of commonly accepted mineral dyes. Numerous potential sources of the raw material have been available in the Central Europe. Haematite-bearing rocks of various genetic origin are worth considering, e.g. Terra Rosa, hydrothermal, sedimentary, scarn, metamorphic, of Lahn Dill type rocks. Their macroscopic features (colour, hardness and others) were probably interesting for Palaeolithic people. All the rocks are characterised by a unique assemblage of microfeatures that enable to ascribe ferruginous artefacts to more or less determined source. Determination of the raw material sources seems to be possible then. Considering that red iron oxides are expected to have possessed specific value, their distribution patterns may have differed from the ones so far recognized for flint, for example. The following litostratigraphic units will be especially taken into account here: the Lower Triassic sedimentary formation, the Upper Cretaceous and Eocene Carpathian red shales, Terra Rosa occurrences and hydrothermal veins of various age. Specific features of the rocks are compared with the analogous ones of ferruginous artefacts representing several Upper Palaeolithic sites in Central Europe.

Matija Turk (Ljubljana)

Neandterthals in Divje babe I (Slovenia): effect of climate on visiting the cave

The Divje babe I Palaeolithic cave site lies in prealpine mountains in westeren Slovenia. During nearly 20 years of excavation (1980-1999) a profile of 12,5 m thick Late Pleistocene sediments had been uncovered. It is now known that the cave had been almost permanently occupied by cave bear in this time period. Occaisonally it was visited also by Neanderthals and finally by Anatomically modern humans. On the basis of scarse stone and bone artefacts and numerous hearths 13 Middle Palaeolithic and one Upper Palaeolithic level were determined.
Divje babe I is currently the best dated Palaeolithic site in Slovenia with time span of finds from 115.000 to 40.000 years ago. A thorough morphological and geochemical analyses of cave sediments have been undertaken as well as palaeobotanical and palaeontological research. On the basis of all this, including chronometrical dates (ESR, ^{14}C) of layers, we have a good insight on the course of climatic and enviromental changes, which were recorded in examined sediments. This allows us to make certain conclusions how climate affected visiting of the cave by Neanderthals.
According to the finds of stone artefacts the visit of the cave as a shelter, drastically increased in climatically unfavorable conditions. In the warm and dry conditions of Early Würm (OIS 5) the cave was rarely visited. The situation changed in cold and humid phases of Middle Würm (OIS 3), where was the highest frequency of visiting. In the warm and humid phases of Middle Würm visit decreased and increased again in cold and dry conditions at the end of stratigraphic sequence. It seems, that beside cold, the humidity was the main factor, which forced Neanderthals to seek shelter in the cave of Divje babe I.

Mara-Julia Weber (Schleswig/Tübingen), Ingo Clausen (Neumünster), Rupert Housley (London), Christopher Miller (Tübingen), Felix Riede (Aarhus/London) & Hartmut Usinger (Kiel)

Preliminary results of the 2008 field work at the Hamburgian site Ahrenshöft LA 58 D

This paper presents some preliminary results of the 2008 excavation at Ahrenshöft LA 58 D (Kr. Nordfriesland, Germany), which has been made possible by the *Hugo Obermaier-Förderpreis*. Situated at the western border of the Saalian moraine area, this site is one of several known Hamburgian settlements which surround a marshy shore area connected to a lateglacial lake. As a consequence of a first excavation campaign in 1995, the aim of the new investigations is twofold: completing the information on the spatial extension and structure of the site and thus the artefact record; dating the cultural layer, i.e. understanding the discrepancy of former radiocarbon and palynological results.
Spatially, the southern part of the artefact concentration has been studied and shows a decreasing artefact density to the south and to the west. Furthermore, differences appear between the successive stages of lithic production. Refitting of stone fragments recovered in 1995 and 2008 enables us to get a first impression of the spatial processes which have taken place at the site. Both typological and technological features confirm the attribution to the Havelte Group of the Hamburgian.
Concerning chronological aspects, the important bioturbation at this site renders stratigraphical connections sometimes difficult. Nevertheless, the cultural layer can be connected with a humous silt layer embedded in fine sands. The origin of these sands as well as site formation processes are analyzed by micromorphology. Unfortunately, dating the stratigraphic sequence, and thus the cultural layer, by means of palynology and microtephra analysis has met difficulties and needs further investigations.

Dieter Schäfer (Innsbruck) & Thomas Weber (Halle/Saale)

Westeregeln – an old site with new perspectives

In 1874, the Berlin palaeontologist Alfred Nehring firstly visited the gypsum quarry Westeregeln in the Northern Harz forelands. After some older discoveries of large mammals like mammoth and rhino he found a charcateristic steppe fauna leading him to the idea about such a landscape in the Late Diluvium (Pleistocene). In the same year in which the Swedish geologist Otto Torrell firstly described the glacial scratches on the limestone surfaces in Rüdersdorf east of Berlin Nehring also described traces of the "diluvial man": splitted bones, charcoal, and flint artefacts including one – perhaps Upper Palaeolithic - blade fragment. Even Rudolf Virchow who was very sceptical against the palaeoanthropological discoveries in the 19th century characterized Nehrings results in 1878 as the first argument for the existence of the Palaeolithic Man in Northern Germany.
During the last years, several new investigations have been undertaken. In the old gypsum quarry but also in the neighboured clay pit (here in ice wedges) some Palaeolithic artefacts were discovered including two bifaces. A small rescue excavation brought faunal remains including mammoth and ass and a radiocarbon date of 50 ka BP. The palaeontologist C. Diedrich re-discovered not only some of the old Nehring finds in different collections but also traces of bone assemblages of hyaenas and their quarry. These investigations will be continued.

Gerd-Christian Weniger (Mettmann)

New investigations in Cueva Morín, Cantabria

Due to the presence of a substantial upper Pleistocene stratigraphy including transitional industries from the late Middle Palaeolithic and early Upper Palaeolithic Cueva Morín plays a key role in the discussion about Neanderthal replacement on the Iberian Peninsula. Especially the presumed existence of a

Châtelperronian occupation in layer 10 gives the site great importance. In cooperation with the University of Cantabria, Santander the Neanderthal Museum is conducting fieldwork in Cueva Morín since 2008. Main objectives are to provide new detailed information about the sedimentological sequence in relation to the different archaeological occupations of the late Middle Palaeolithic and the Upper Palaeolithic and to expand our knowledge about the early Middle Palaeolithic occupations from the lower part of the stratigraphy. In addition the dark zone of Cueva Morín was prospected and provides new insight into the activities of Palaeolithic settlers in the cave.

Sibylle Wolf & Martina Barth (both Tübingen)

Exhibition Baden-Württemberg 2009 „Ice Age – art & culture“

Between the 18th of September 2009 and the 10th of January 2010, the state of Baden-Württemberg will present its major biannual exposition “Ice Age – art and culture” in Stuttgart. This poster presents the structure and content of the state exposition. The exhibition is coordinated by the Archäologisches Landesmuseum Baden-Württemberg in collaboration with the Eberhard-Karls-Universität Tübingen, Department of Early Prehistory and Quaternary Ecology and the State Preservation office of Baden-Württemberg.
The exposition focuses on latest research conducted in the field of Paleolithic archaeology. Visitors will experience Ice Age climates and landscapes, as well as central aspects related to human evolution and fossil history. Important artefacts and art from all over Europe are presented; some of them are exhibited for the first time. The origins of art and music form a central theme of the exhibition, which highlights some of the oldest figurative art known, namely the small figurines from the Swabian Alb.

Mohsen Zeidi, Rahmat Naderi & Nicholas J. Conard (all Tübingen)

Archaeological Survey in the Kazerun and Marvdasht Regions of the Southwestern Zagros Mountains of Iran

In summer 2008 researchers from the University of Tübingen conducted an archaeological survey with the goal of identifying and documenting locations that preserve deposits from the terminal Pleistocene and Early Holocene in the southern Zagros Mountains of Iran. This work focused on the survey and surface collection of open-air sites, caves and rock shelters. The team conducted fieldwork in two main geographical areas in the Fars Province 1) the Kazerun region, and 2) The Kur River Basin in Marvdasht. In all, we surveyed 72 localities and collected artifacts from 49 sites. The team placed particular emphasis on the caves and rock shelters in the Kazerun region. We identified one new ceramic Neolithic site and visited several caves and rock shelters in the Kur River Basin. Survey in Kazerun produced promising assemblages of terminal Pleistocene artifacts from caves, rock shelters and their slopes. Some of these localities have potential to produce good data for studying the Pleistocene-Holocene transition and the beginning of agriculture. Initial results from both survey areas document a sequence of occupation from Late Paleolithic to the Neolithic.

Exkursionsbeiträge (*Excursion´s Guide*)

Die Besiedlung Sloweniens während des Eiszeitalters

von VIDA POHAR, Ljubljana

Die ersten Anfänge der Paläolithikum-Forschung in Slowenien reichen in die erste Hälfte des 20. Jahrhunderts zurück. Mit der Entdeckung der Aurignac-Station der Höhle Potočka zijalka (S. Brodar, 1928) hat sich die Zahl der paläolithischen Fundorte schnell erhöht. Heutzutage sind rund 40 solche Fundstellen bekannt. Die Mehrheit davon sind Höhlen-Fundstellen, nur vier sind Freilandstationen.

Altpaläolithikum

Bisher entdeckte man in Slowenien noch keine Steinwerkzeuge (z.B.Faustkeile), die mit Sicherheit dem Altpaläolithikum zugeordnet werden könnten. Es gibt zwar einige atypische Steinwerkzeuge angefertigt aus Abschlägen (die Höhle Betalov spodmol bei Postojna – Abb. 1/11, Risovec bei Postojna – Abb. 1/36, die Höhle jama pod Herkovimi pečmi – Abb. 1/1 und die Höhle jama v Lozi bei Postojna – Abb. 1/17), doch wegen ihrer noch nicht geklärten stratigraphischen Verhältnisse ist deren Kulturangehörigkeit zweifelhaft. Hinsichtlich der entdeckten Tierreste in diesen Fundorten (Deninger Bär, mittelpleistozänes Reh) wird vermutet, dass die oben aufgezählten Höhlen dem Menschen gegen Ende des Mittelpleistozäns Schutz boten. Der spärliche Kulturnachlass aus diesen Fundorten sollte dem älteren Paläolithikum angehören.

Mittelpaläolithikum

Aus dem letzten /Riss/ Würm) Interglazial und dem Altwürm (WI) gibt es mehr Beweise für den Aufenthalt des Eiszeitmenschen auf dem Territorium Sloweniens und damit auch für die Besiedlung der Tierarten in unserem Land. Während dieser Zeit lebte in dieser Gegend der Neandertaler. Die Kultur, die er hinterließ, wird mit der des Moustériens gleichgesetzt. Sie wurde in 20 Fundorten festgestellt (Abb. 2).

Die repräsentativen Fundorte dieser Kulturstufe sind die Höhlen Betalov spodmol (Abb. 1/11) und Divje babe (Abb. 1/31). In den zahlreichen Moustérien Horizonte beider Höhlen überwiegen die Schaber angefertigt auch aus Klingen und Abschlägen, die mit der Levallois-Abschlag Technik gewonnen wurden. Die Moustérienspitzen und die gezähnten Stücke sind seltener aufzufinden. In der Höhle Divje babe (Abb. 1/31) wurden neben den mittelpaläolithischen Werkzeugen auch Stücke, die typisch für Aurignacien sind, aufgefunden: Hochkratzer, Fragmente der Knochenspitzen und die »Flöte« gefertigt aus dem Femur/ Oberschenkelknochen des jungen Höhlenbären der Art *Ursus ingressus*.

Jungpaläolithikum

Von den Kulturstufen des Jungpaläolithikums wurden in Slowenien nur zwei festgestellt: das Aurignacien und as Gravettien mit den Unterstufen Tardigravettien und Epigravettien (Abb. 2)

Dem Aurignacien gehören 5 Fundorte, unter ihnen sind die wichtigsten die Höhlen Potočka zijalka (Abb. 1/2) und Mokriška jama (Abb. 1/5). Das Steinkulturinventar besteht aus seltenen Kiel- und Schulterkratzern, Aurignacienklingen und Schabern, die eher an das Mittelpaläolithikum erinnern. Viel bedeutender sind die zahlreichen Knochenspitzen mit solider und seltener mit gespaltener Basis.

Der Kulturnachlass der ausgehenden Altsteinzeit (Spätwürm – WII+WIII) gehört dem Gravettien an. Mit Hinsicht auf die überwiegenden Tierreste angesammelt in den Gravettien-

Fundorten und die immer größere Mikrolithisation des Steinwerkzeuges unterscheiden wir drei Stufen:

1) Die älteste Stufe wurde Gravettien benannt. Der Form der Steinwerkzeuge nach stimmt sie mit dem Europäischen Gravettien überein. In den Fundorten Špehovka (Abb. 1/4), Betalov spodmol (Abb. 1/11) und Parska golobina (Abb. 1/20) überwiegen die Fossilreste des Höhlenbären der Art *Ursus ingressus*, den wir in beiden späteren Stufen nicht mehr vorfinden.
2) Mit dem Beginn des letzten Würmstadials (Hochglazial) lebte in unserer Gegend die arktisch-alpine Fauna: Rentier und Alpenmurmeltier; Polarfüchse und Mammuts waren seltener. Die zahlreichen Steinwerkzeuge (enge Klingen, Klingenlamellen mit Rücken, Gravettien-Klingen, atypische Kerbspitzen, Klingen mit Endretusche, Kratzer) und seltene Knochenspitzen wurden der Kulturstufe Tardigravettien zugeordnet. Sie wurden in den Höhlen-Stationen Ovčja jama (Abb. 1/18) der Höhle jama v Lozi (Abb 1/17) und der Höhle Ciganska jama (Abb. 1/24) entdeckt. Eine weitere Tendenz zur Verringerung der Steinwerkzeuge ist zu bemerken, in immer größerer Anzahl kommen die so genannten Mikrolithen vor.
3) Im Spätglazial entwickelte sich aus dem Tardigravettien das Epigravettien (Abb 2). Die Fundorte dieser Kulturstufe gibt es in allen Gebieten Sloweniens. Die wichtigsten davon sind: Županov spodmol im Karst (Abb. 1/16), Babja jama bei Ljubljana (Abb. 1/25) Poljšiška cerkev bei Bled (Abb. 1/26) und Lukenjska jama in Dolenjska (Abb. 1/32).

Während der ausklingenden Eiszeit erwärmte sich die Atmosphäre langsam, das Rentier ersetzte zuerst den Elch, danach der Rothirsch. Die meisten Vertreter der Tundra und des Hochgebirges wichen in ihre ursprüngliche Umwelt zurück, nur das Alpenmurmeltier ist nicht in die Berge zurückgekehrt, sondern besiedelte das ganze Slowenien und stellte so das Hauptjagdtier des Spätglazialmenschen dar.

Die Steinwerkzeuge sind dem Tardigravettien ähnlich, in größerer Anzahl kommen die Daumennagelkratzer, die Kreissegmente, die Dreiecke und Rechtecke vor, die auf den Übergang ins Mesolithikum hindeuten.

Legende zu Abb. 1: Topographische Karte Sloweniens mit eingezeichneten Gletscher- und Altsteinzeit-Stationen.

1. Höhle jama pod Herkovimi pečmi bei Radlje
2. Potočka zijalka auf Olševa
3. Mornova zijalka bei Šoštanj
4. Špehovka bei Zgornji Dolič
5. Mokriška jama oberhalb von Kamniška Bistrica
6. Nevlje bei Kamnik
7. Blatni vrh bei Jurklošter
8. Njivice bei Radeče
9. Vrhnika
10. Dobravlje bei Dutovlje
11. Betalov spodmol bei Postojna
12. Otoška jama bei Postojna
13. Postojnska jama
14. Kostanjevica an der Krka
15. Pod Kalom bei Nabrežina (Pocala bei Aurisina)
16. Županov spodmol bei Sajevče
17. die Höhle jama v Lozi bei Orehek
18. Ovčja jama bei Prestranek
19. Roška špilja und Škocjanska jama
20. Parska golobina bei Pivka
21. Črni Kal oberhalb von Koper
22. Loka bei Podpeč
23. Zakajeni spodmol bei Prestranek
24. Ciganska jama bei Željne
25. Babja jama bei Gorjuša oberhalb von Dob
26. Poljšiška cerkev bei Zgornje Gorje
27. Ruperč vrh in Dolenjska
28. Matjaževe kamre bei Rovte
29. Podrisovec bei Postojna
30. Marovška zijalka bei Šentlovrenc in Dolenjska
31. Divje babe bei Šebrelje (das Tal der Idrijca)
32. Lukenjska jama bei Novo mesto
33. Meriševo bei Solkan
34. Mamula bei Radeče
35. Vilharjeva jama bei Postojna
36. Risovec bei Postojna

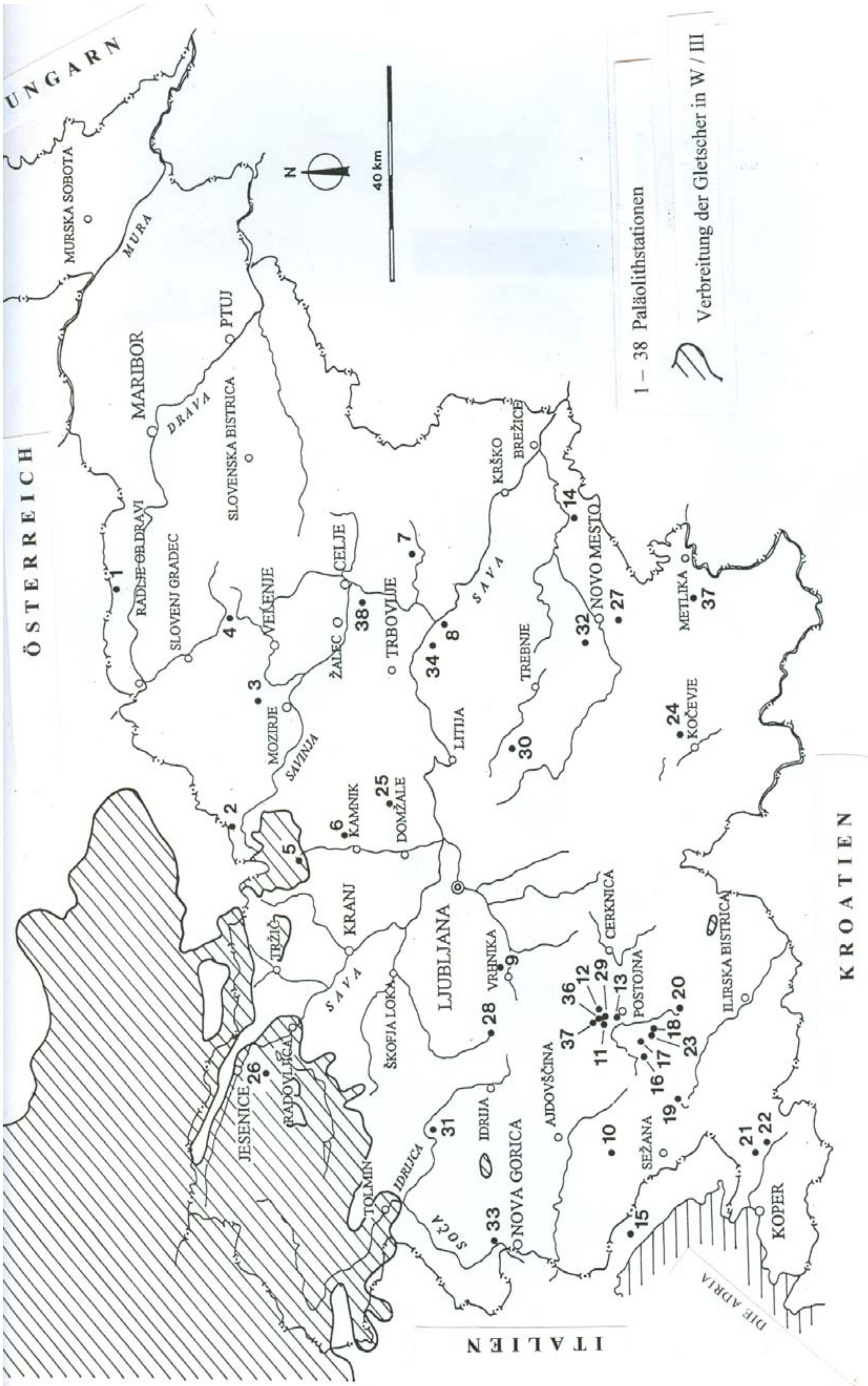


Abb. 1: Topographische Karte Sloweniens mit eingezeichneten Gletscher- und Altsteinzeit-Stationen.

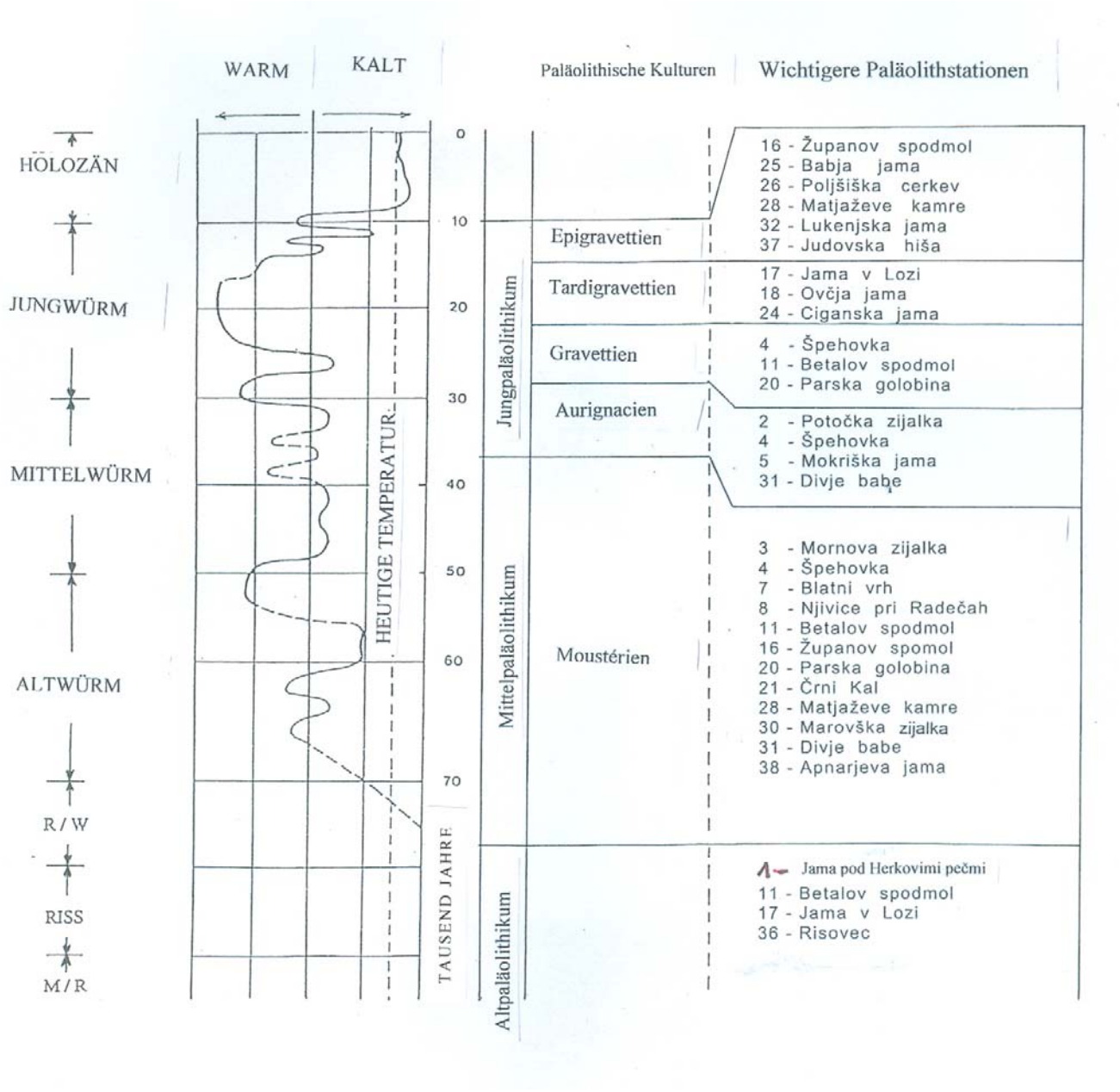


Abb 2. Zeittafel der altsteinzeitlichen (Paläolithischen) Kulturen in Slowenien

Wednesday, April 15th – Excursion I: Betalov spodmol Cave

14.00: Departure from Ljubljana
15.00: Visit to the Betalov spodmol Palaeolithic site
15.45: Departure to Lokev
16.30: Arrival at the Trhlovca cave Neolithic site
16.45: Welcoming address by David Terčon, Mayor of Sežana, reception with local vine and smoked ham
17.15: Visit to shepherd's cottages guided by Boris Čok
18.00: Film show in Trhlovca cave – »The Day of the First Flute« (documentary/fictional)
19.00: Departure
20.00: Arrival to Ljubljana

Betalov spodmol, die Bärenhöhle und die Paläolithstation

von VIDA POHAR

Die Höhle Betalov spodmol liegt an der Straße, die von der 2,5 km entfernten Höhle Postojnska jama, an der Ortschaft Veliki Otok vorbei in Richtung Predjama führt. Die Höhle wurde vom Wasser im Rudistenkalk der Oberen Kreide an einer größeren tektonischen Spalte auf einer Meereshöhe von 537 m geformt. Ihre Länge beträgt 174 m (Abb. 1) und sie hat eine mehr oder weniger horizontal verlaufende Sohle. F. Anelli hat in der Höhle von 1932 bis zum Beginn des 2. Weltkriegs gegraben. Er grub 1,8 m tief. S. Brodar fuhr von 1947 bis 1953 mit paläolithischen Ausgrabungen (Abb. 2) fort. Abgegraben wurde von der rechten bis zur linken Höhlenwand. Die Abgrabung reichte im Vorderhöhlenraum bis 6,5 m weit vor die Traufe, ins Höhleninnere aber 20 m weit, d.h. bis 6 m hinter der ersten Biegung des Ganges (Abb. 2). Das angesammelte Material wurde von F. Osole bearbeitet. Die festgestellten 16 Schichten hat er in 6 stratigraphische Komplexe zusammengefasst. (Abb. 3) Die faunistischen Reste wurden von I. Rakovec und V. Pohar näher bestimmt.

Komplex I (Schichten 16 und 15)
Beide Schichten bestehen aus allochthonen Sanden und Lehmen.
Tierknochenreste: Wolf, unbestimmbare Wiederkäuer (*Bos seu Bison*)
Alter: Mittlerer Pleistozän (Mindel/Riss Interglazial?)

Komplex II (Schicht 14)
Scharfkantiger Schutt mit Lehmbeimischung, abgefallenen Tropfsteinen und Sinter.
Tierknochenreste: Deninger Bär, (*Ursus cf. deningeri*), der Höhlenbär (*Ursus sp.*)
Kulturinventar: atypische Steinwerkzeuge (darunter seltene Schaber) aus dem älteren Paläolithikum (**Kulturhorizont A**) – Altpaläolithische Abschlag Kultur
Alter: vorletzter Glazial (Riss)?

Komplex III (Schichten 13 und 12)
Parautochtoner roter Lehm mit seltenem korrodiertem Schutt verschiedener Größe.

Tierknochenreste: Schneehase, Alpenmurmeltier, Höhlenbär (*Ursus* sp., überwiegt,), Wolf, Fuchs, Wildkatze, Wildschwein, Rothirsch, Elch, unbestimmbarer Wiederkäuer und Waldnashorn (*Dicerorhinus kirchbergensis*)
Kulturinventar: zahlreiche Steinwerkzeuge (Schaber, Moustérien-Handspitzen, Levallois-Spitzen, Klingen) gefertigt aus Levallois-Abschlägen des Typs Moustérien La Ferrassie (**Kulturhorizont B**)
Alter: wahrscheinlich Früh- bis Mittelwürm

Komplex IV. A (Schicht 11)
Roter Lehm vermischt mit Schutt und Sinter.
Tierknochenreste: Schneehase, Alpenmurmeltier, Höhlenbär, (*Ursus sp.*), Höhlenhyäne, Elch, Rothirsch, Steppenbison.
Kulturinventar: verschiedene Schaber (Gerad-, Hohl-, Bogen-, Spitz- und Querschaber) gehören dem **Kulturhorizont C und D** (Moustérien Typ Charentien)
Alter: wahrscheinlich Früh- bis Mittelwürm

Komplex IV. B (Schicht 10)
Rötlicher Lehm vermischt mit Schutt, dem wurde in der Höhle Sintermehl beigemischt.
Tierknochenreste: Schneehase, Alpenmurmeltier, Höhlenbär (*Ursus ingressus*, überwiegt), Elch, Wiederkäuer, Steppenfalke (*Falco cherrug*).
Kulturinventar: Im Komplex befinden sich zwei Kulturhorizonte. Zum älteren **Kulturhorizont E** gehören die retuschierten kleineren Abschläge, atypische Kratzer, gezähnte Stücke und engere Klingen, die an das jüngere Paläolithikum erinnern. Die Geräte gehören dem Endmoustérien.
Im jüngeren **Kulturhorizont F** kommen engere Klingen, Stichel, Hochkratzer (Schulter- und Kielkratzer), Klingenlamellen mit Rücken und Gravettienspitze vor. Alle gehören dem Gravettien.
Alter: Mittelwürm (Kulturhorizont E) und Beginn des Spätwürm (Kulturhorizont F).

Komplex V A und B (Schichten 9 und 8)
Die meisten Schichten aus diesem Komplex wurden von F. Anelli in solcher Weise ausgegraben, dass Brodars Ausgrabung nur einen kleineren Teil der Sedimente 4 bis 6m vom Höhleneingang entfernt umfasst. Die Schichten in diesem Komplex bestehen aus Schutt vermischt mit grau-bräunlichem Lehm.
Tierknochenreste: Typische Arten des Spätwürm dominieren, Schneehase, Alpenmurmeltier, Polarfuchs, Fuchs und im unteren Teil des Komplexes noch Höhlenbär (*Ursus ingressus*), Rentier, Elch, Steppenbison, Wiederkäuer und Steppenfalke (*Falco cherrug*)
Kulturinventar: typologisch bestimmbare Werkzeuge des Gravettien Technokomplex – **Kulturhorizont G** (Atypische Gravette-Spitze, Klinge mit Endretusche, Klinge mit beidkantiger Retusche, Stück mit Kerben, Klingenkratzer, Bohrer).
Alter: Spätwürm und der Beginn des Spätglazials.

Komplex VI (Schichten 7 bis 1)
Die Schichten 7 bis 5 bestehen aus kleinem scharfkantigem Schutt, teilweise ohne Lehmbeimischung, anderswo vermischt mit ein bisschen rötlichem Lehm oder Holzkohle und mit Sinter durchtränkt.
Tierknochenreste: Alpenhase, Hamster, Alpenmurmeltier, Dachs, Bär, Fuchs, Baummarder, Wildschwein, Elch, Rothirsch, Reh.
Kulturinventar: wenige Steinwerkzeuge des ausklingenden Gravettiens – **Kulturhorizont G**.
Alter: Spätglazial

Die jüngsten vier Schichten (4 bis 1) bestehen aus Schutt vermischt mit Humus, Sinterkrusten und Holzkohlesplitter.
Tierknochenreste: Wolf, Fuchs, Dachs, Elch, Reh, Rothirsch, Wildschwein und Schwein, Gams.
Kulturreste sind atypische Steinabschläge, ein durchgebohrter Zahn eines Rothirschen (Mesolithikum?), in den Schichten 3 bis 1 wurden zahlreiche Funde aus der Eisenzeit bis zum Mittelalter aufgesammelt. **Kulturhorizont H**.

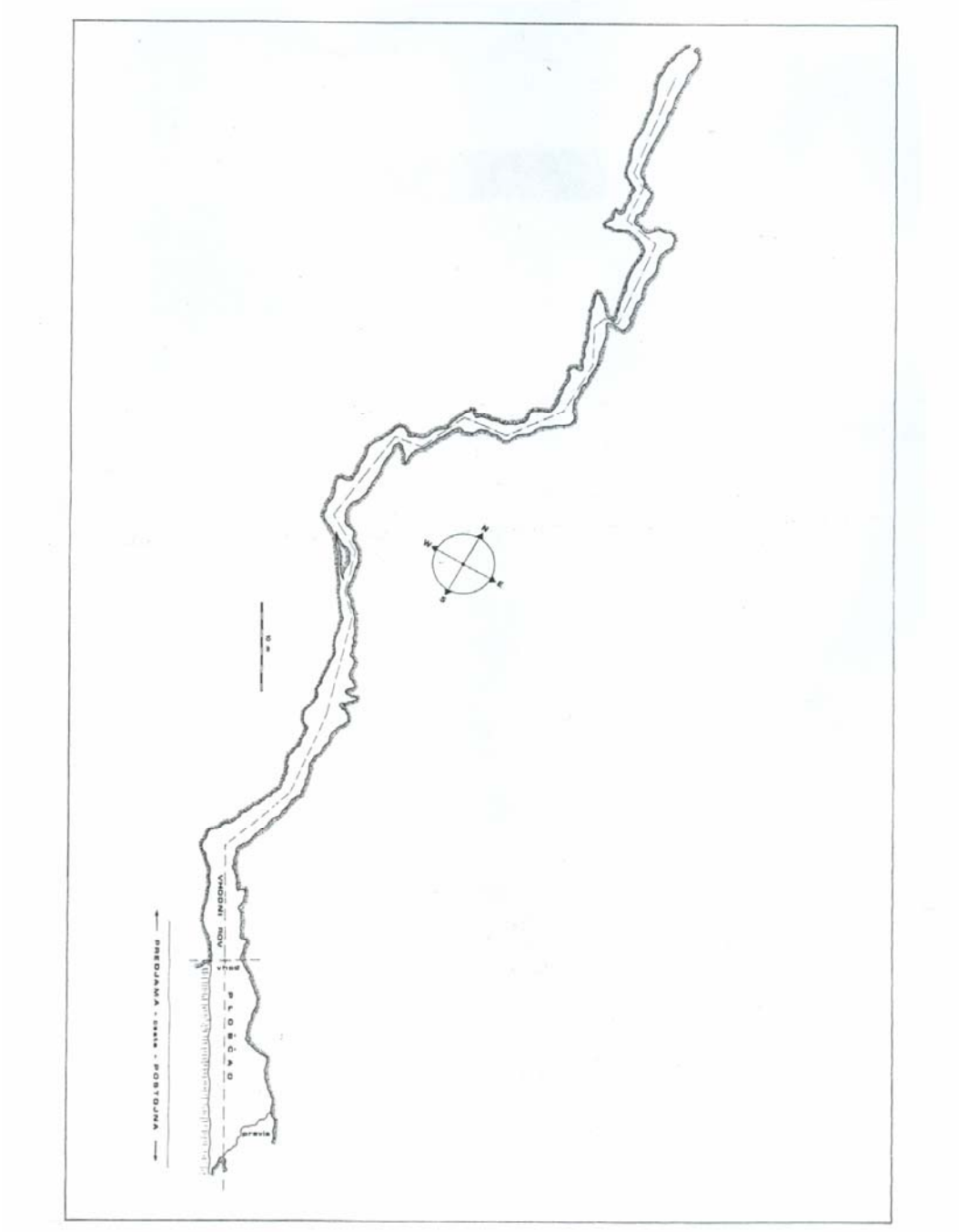


Abb. 1: Betalov spodmol, Grundriss

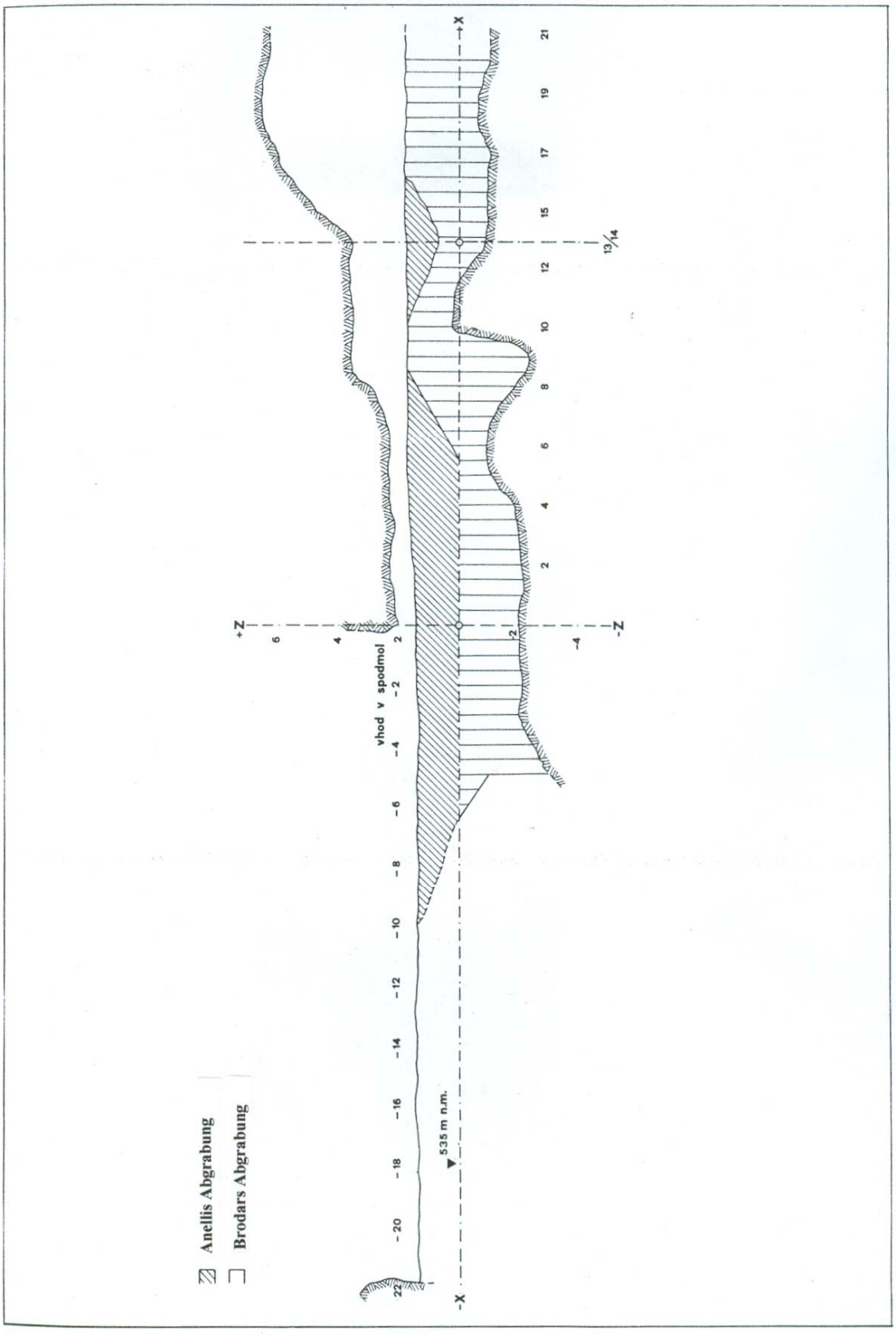


Abb. 2A: Betalov spodmol, Längsschnitt nach der x-Achse mit Brodars und Anellis Abgrabung

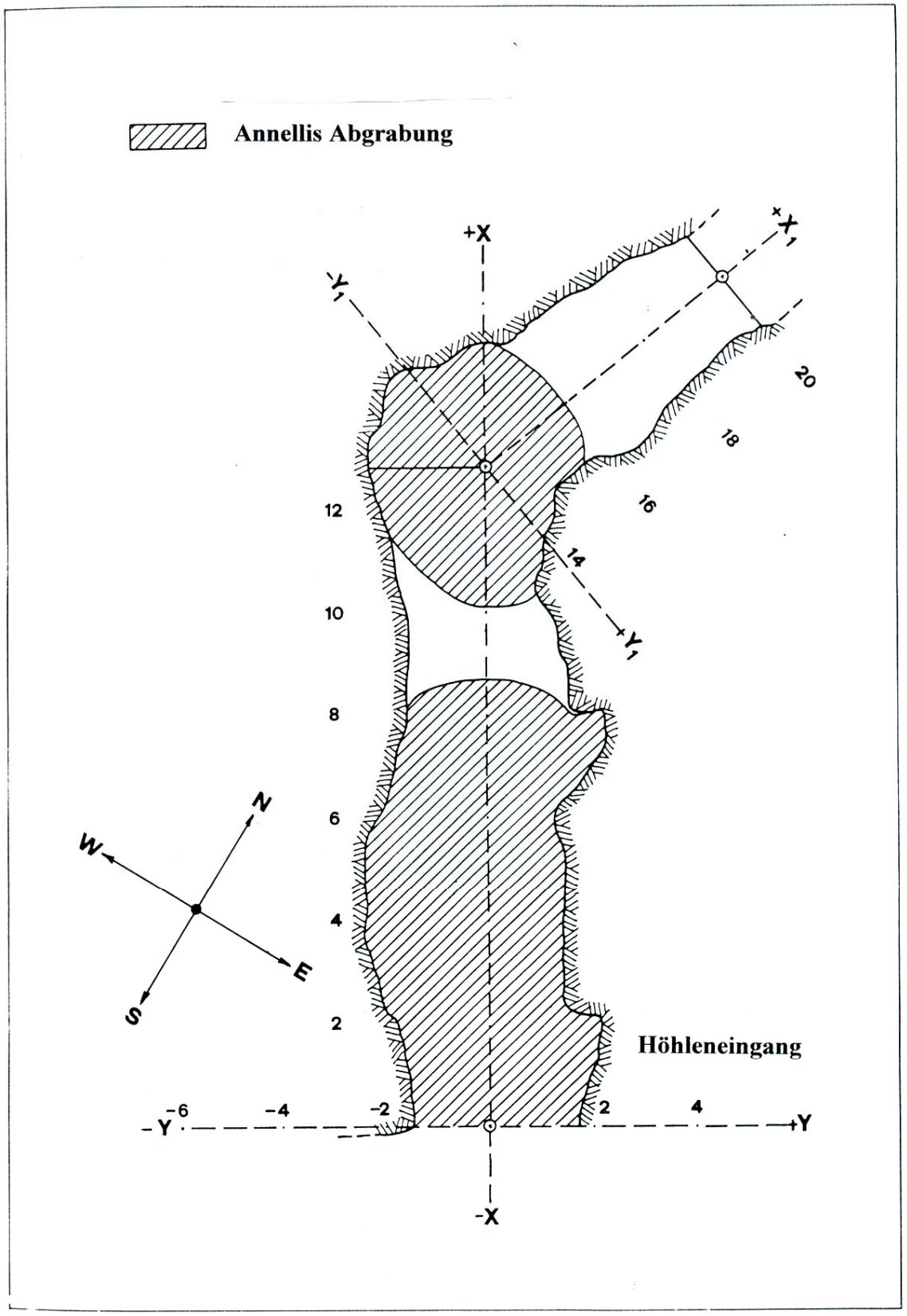
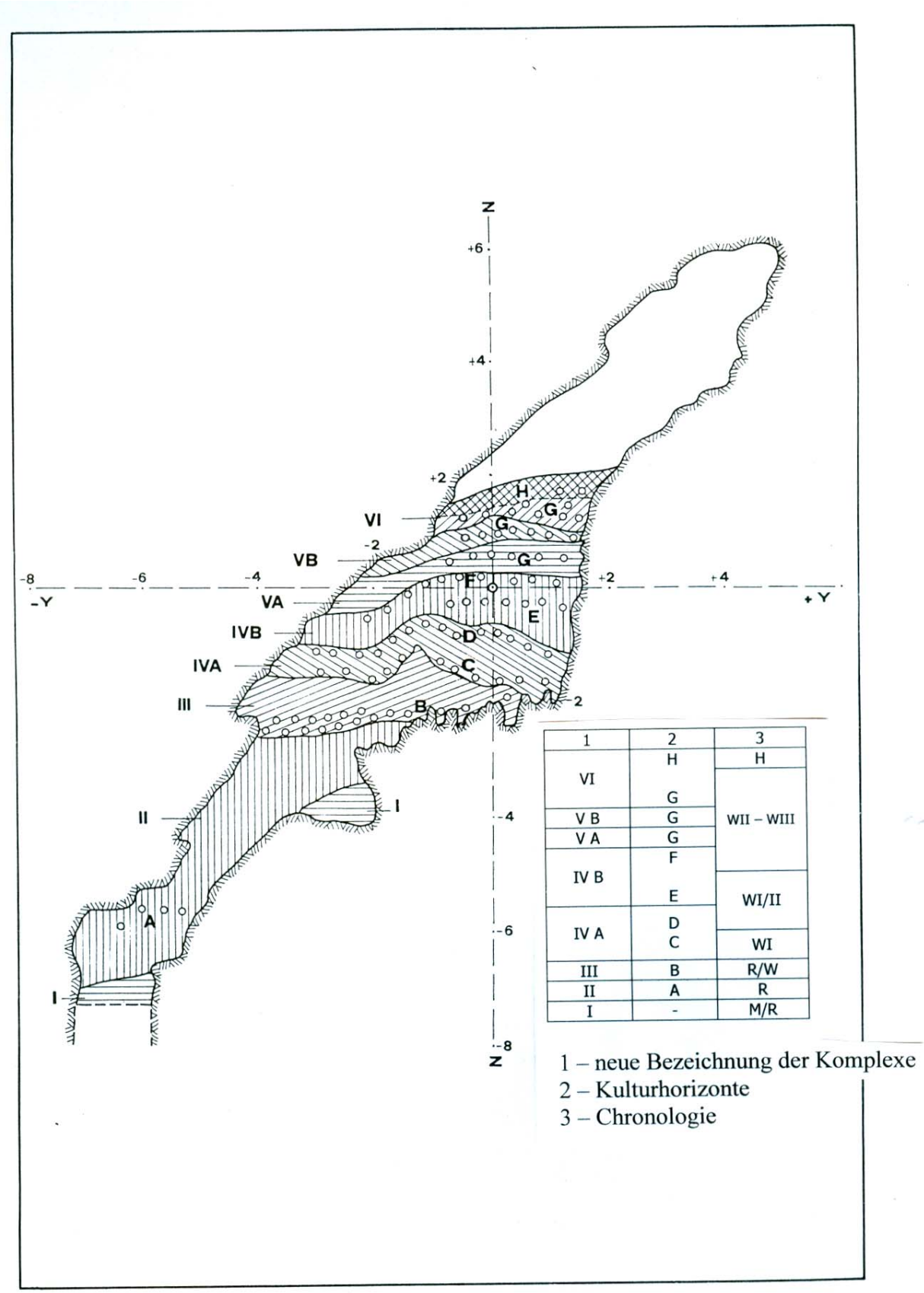


Abb. 2B: Betalov spodmol, Grundriss des Eingangsteils von F. Anellis Abgrabungsfläche



1	2	3
VI	H	H
	G	WII – WIII
V B	G	
V A	G	
IV B	F	WI/II
	E	
IV A	D	WI
	C	
III	B	R/W
II	A	R
I	-	M/R

Abb. 3: Betalov spodmol, schematisches Querprofil mit vertikaler Anordnung der Kulturhorizonte von A bis H.

Friday, April 17th – Excursion II: Divje babe and Križna jama

Presentation Divje babe: guided by V. Pohar, I. Debeljak,
Presentation Križna jama: guided by V. Pohar, G. Rabeder
(Alternative program with rainy weather: Idrija-Mine, Mala Triglavca and Škocjanske)

Die Höhle Divje babe I

von VIDA POHAR und GERNOT RABEDER

Der Fundort Divje babe I ist eine 45 m lange und 15 m breite, waagrechte Höhle, die im Obertrias-Dolomit (Karn) entstanden ist. Die Höhle liegt unter dem Rand des Plateaus Šebrelje, 230 m über dem Flussbett der Idrijca in der Nähe des Dorfes Reka bei Cerkno und auf einer Meereshöhe von 450 m.
M. Brodar hat in den Jahren von 1978 bis 1986 in der Höhle Ausgrabungen durchgeführt. Nach einer kurzen Unterbrechung fuhr er mit den Ausgrabungen 1989 fort und beendete sie im Jahre 1999. In einem 12m hohen Sedimentprofil wurden 26 Schichten unterschieden, doch die Höhlensohle wurde nicht erreicht. M. Brodar und I. Turk bearbeiteten das angesammelte Material mit Hilfe von zahlreichen Autoren. B. Tokar, I. Debeljak und B. Kryštufek bestimmten die faunistischen Fossilreste, die paläobotanischen Reste wurden aber von M. Culiberg und A. Šercelj bestimmt.

Beschreibung der Schichten mit Kultur- und Fossilresten

I. Turk (1997 und 2007) hat die Forschungsergebnisse der Schichten 8 bis 2 genauer beschrieben, die übrigen Schichten warten auf eine Veröffentlichung. Im Ganzen sind die Tier- und Fossilreste veröffentlicht.
I. Turk hat das ganze Profil (Schichten 23 bis 1) in drei Teile eingeteilt, die er »Facies« nennt, besser wäre der Ausdruck »Schichtenkomplex« oder nur »Komplex«
Den unteren Teil benannte er »Facies« C. Er umfasst die Schichten 23 bis 13, der mittlere Teil gehört der »Facies« B (Schichten 12 bis 7) und der jüngste, obere Teil stellt die »Facies« A (Schichten 6 bis 2) dar, Schicht 1 gehört schon in das Holozän.

Komplex C (Schichten 23 bis 13)
Im unteren Teil dieses Komplexes ist dicker korrodierter Schutt, hie und da auch stark verwittert, vermischt mit Sintermehl und verklebt mit phosphatischem Bindematerial. Nach oben geht der Komplex in den mittelgroßen kryoklastischen Schutt über, stellenweise sind die Sedimente zu Brekzien verklebt und mit Versturzblöcken (Felsen) vermischt.

Fossilreste: Höhlenbär *(Ursus ingressus)* und Braunbär (*U. arctos)*, Wolf, Fuchs, Marder, Höhlenlöwe, Gams, Rothirsch, Reh
Kultur: im oberen Teil dieses Komplexes gibt es seltene Steinwerkzeuge des Mittelpaläolithikums
Alter: Von I. Turk (2007) wird dieser Komplex in das Frühwürm (OIS 5a-d) gestellt, begründet auf problematischen ESR- (115ka bis 80ka v.h.) und Uran/Thorium-Daten (83,7 und Mehr als 20 ^{14}C Datierungen (Nelson in TURK 1997:61) ergaben aber Alter zwischen 27,2 und 51,2ka v.h. (sowie vier Daten »älter als« >36, >36, >53, >54ka). Diese Daten sagen

uns, dass die datierten Knochen und Holzkohlestücke zumindest innerhalb des ganzen Sedimentpakets umgelagert sind und alle aus dem **Mittelwürm** stammen. Neue Datierungen mit der AMS-Methode sind in Arbeit.

Komplex B (Schichten 12 – 7)
Diese Serie beginnt mit mittelgroßem, stark korrodiertem Schutt mit Beimischung von kleineren Felsen. Der Schutt ist stellenweise verklumpt, an anderen Stellen locker mit verschiedener Beimischung von Sand (zerfallener Dolomit).

Fossilreste: Hase, Alpenmurmeltier, Höhlenbär *(Ursus ingressus)* und Braunbär (*U. arctos)*, Wolf, Polarfuchs, Iltis, Baummarder, Fuchs, Höhlenlöwe, Rothirsch, Reh, Gämse.
Kultur: In allen Schichten dieses Komplexes kommen seltene Moustérien-Steinwerkzeuge vor. Unter den Funden wurde in Schicht 8 eine Knochenflöte entdeckt. Sie könnte der Neandertaler aus dem Femur eines jungen Höhlenbären gefertigt haben. Mit Hinsicht auf mehrere verschiedene Datierungen des Knochens und der Zähne in dieser Schicht variiert das Alter der Flöte stark. Radiometrische Datierungen (^{14}C) der Höhlenbärenknochen aus der Schicht 8 zeigen Alter zwischen 43.000 und 45.000 Jahren (^{14}C -Daten: 40,3, 45,8, 49,2, 40,6ka), die Datierung mit der Elektronen-Spin-Resonanz-Methode (ESR) dagegen ein Alter von mehr als 55.000 Jahren.
Alter: Mittelwürm, OIS 3. ^{14}C Datierung: von 50 bis 40,3ka
ESR Datierung: zwischen 65.000 und 50.000 Jahren

Komplex A (Schichten 6- 2)
Im unteren Teil kam es zu einem Felsversturz und zur Anhäufung dicken Schutts und einzelner größeren Felsen. Der Schutt ist auf der unteren Seite korrodiert. Gegen die Oberfläche vermehrt sich die Menge des Dolomiten-Verwitterungsgesteins (Sand und Ton) bis sie in Schicht 2 in scharfkantigen kryoklastischen Schutt übergeht. Schicht 2 ist im unteren Teil kryoturbat gefaltet und enthält einen jüngeren paläolitischen Kulturnachlass.

Fossilreste: Hase, Alpenmurmeltier, Bär und Höhlenbär *(U. ingressus),* Wolf, Fuchs, Iltis, Baummarder, Otter, Luchs, Leopard, Höhlenlöwe, Wildschwein, Rothirsch, Reh, Gams, Steinbock.
Kultur: In dieser Serie treten zwei Kulturstufen auf: Moustérien und Aurignacien. Als mittelpaläolithisch werden zahlreiche Werkzeuge gedeutet: Hochkratzer, Werkzeuge mit Querretusche etc. Im Aurignacien-Horizont kommen Knochenspitzen, unter den Steinwerkzeugen Schaber vor.
Alter: Mittelwürm, OIS3, ^{14}C Datierungen: 35,3 und 43,4ka

Literatur:

TURK, I. (ed.) 1997. Moustérian »bone flute« and other finds from Divje Babe I cave site in Slovenia. – Opera Instituti Archaeologici Sloveniae **2**: 1-223, Ljubljana
TURK, I. 2007. Divje Babe I. Upper Pleistocene Palaeolithic site in Slovenia. Part I. - Opera Instituti Archaeologici Sloveniae **13**: 1-448, Ljubljana

Die Höhlenbären der Krizna jama, Slowenien

Von GERNOT RABEDER

Die Krizna jama oder Kreuzberghöhle liegt mitten im klassischen Karstgebiet von Slowenien und ist wohl in erster Linie wegen der prachtvollen Tropfsteingebilde bekannt. Entlang eines unterirdischen Wasserlaufes kann diese einzigartige Welt über eine Länge von über acht Kilometern mit Schlauchbooten befahren werden.
Weniger bekannt ist die Krizna jama als Fundstelle von Höhlenbären und anderen Tieren des Eiszeitalters, obwohl bereits vor über 125 Jahren ein Forschungsteam des Naturhistorischen Museums in Wien die ersten Grabungen durchführte. Die Erforschung der Höhle in den Jahren 1879 und 1881 leitete Ferdinand von Hochstetter, der bekannte österreichische Naturforscher, der auch an der Weltumsegelung der „Novara" teilgenommen hat. Bereits 40 Jahre zuvor veröffentlichte J. ZÖRRER (1838) einen ersten Höhlenplan und beschrieb Funde von Höhlenbären.
Die Grabungen von F. Hochstetter erbrachten ein reiches Fundmaterial, das vorwiegend aus Knochen des Höhlenbären bestand. Im Fundbericht spricht HOCHSTETTER (1881) von über 100 Unterkiefern und Schädeln, sowie zahlreichen anderen Skelettelementen, die in zwei Seitenteilen (Bärengrotte und Kittl's Bärenhöhle) zu Tage kamen. Die Funde gelangten ans Naturhistorische Museum in Wien und blieben seitdem unbeachtet. Allerdings sind die Schädel und Unterkiefer nicht auffindbar, sehr wohl aber die Elemente des postkranialen Skelettes. Eine paläontologische Aufarbeitung findet derzeit statt.
In einer Kooperation des Institutes für Geologie der Univ. Ljubljana und des Institutes für Paläontologie der Univ. Wien wurden die Forschungen in der Höhle nun neu aufgenommen. Da sich natürlich sowohl Grabungsausrüstung und –methoden als auch der wissenschaftliche Kenntnisstand seit der Zeit der Monarchie grundlegend geändert haben, wurden in den Jahren 1999 und 2001 Nachgrabungen an den von Hochstetter angegeben Stellen durchgeführt. Ziel war es, die Stratigraphie und die Chronologie der Sedimentlagen und der Knochen zu klären.

Fragestellung und erste Ergebnisse
Fünf ^{14}C-AMS-Daten belegen, dass die Höhlenbären aus „Hochstetter's Schatzkammer" aus dem Mittelwürm stammen, also rund 45.000 Jahre alt sind (RABEDER & WITHALM 2001). Die meisten Funde aus Kittl's Bärenhöhle sind gleich alt, aber auch jüngere Nachweise von Höhlenbären um 32.000 BP liegen vor. Beide Fundbereiche liegen in höher gelegenen Seitenteilen der Höhle, die vor ständigen Wassereinbrüchen geschützt blieben. In Kittl's Bärenhöhle liegen die Reste zum Teil in ungestörter Lagerung vor, das heißt die Knochen der Bären wurden nach ihrer Einbettung nicht oder nur wenig umgelagert. Da auch ausreichend Fundmaterial vorhanden ist, besteht die Möglichkeit, repräsentative Ergebnisse zur Populationsstruktur, Größe und zur morphologischen Charakteristik dieser Bärenpopulation zu erhalten.
Auffällig ist vor allem die Größe der Bären - eine Schädellänge von über 50cm ist auch für Höhlenbären selten. Die Größe und das Kauflächenmuster der Zähne deuten daraufhin, dass diese Bären jenen Populationen entsprechen, die in alpinen Fundstellen, wie der Potocka zijalka in Nordslowenien oder der Gamssulzenhöhle in Oberösterreich, auftreten. Durch die Forschungen der letzten Jahre hat sich herausgestellt, dass diese Bären einem eigenständigen Zweig der Höhlenbärengruppe angehören (RABEDER & Hofreiter 2004).
Die Auswertung der Prämolaren-Morphologie ergab eindeutig, dass die Bären der Krizna jama zu *Ursus ingressus* zu stellen sind (s. Diagramm). In einer umfangreichen Monographie, die

noch in diesem Jahr fertig gestellt werden soll, wird auch anderen Fragen wie Populationsstruktur, Sexualdimorphismus, Ontogenie, Ernährung etc. nachgegangen.

C14-Datierungen von Proben aus der Krizna jama:

Labor-Nr.	Proben-Nr.	C14-Daten	1 sigma	Material	Herkunft	kalibriertes Alter
VERA-1287	KJ-7B	**46.700**	+2400/-1800	Höhlenbärenknochen	Monumentenhügel	-
VERA-1289	KJ-48B	**44.800**	+1800/-1400	Höhlenbärenknochen	Ölberg	-
VERA-1291	KJ-43	**45.000**	+1900/-1600	Höhlenbärenknochen	Monumentenhügel	-
VERA-2187	KJ-170	**740**	+35/-35	Holzkohle	Kittls Bärenhöhle	1210AD-1300AD
VERA-2188	KJ-204	**46.500**	+1200/-1100	Höhlenbärenknochen	Kittls Bärenhöhle	-
VERA-2189	KJ-205	**32.550**	+220/-220	Höhlenbärenknochen	Kittls Bärenhöhle	-

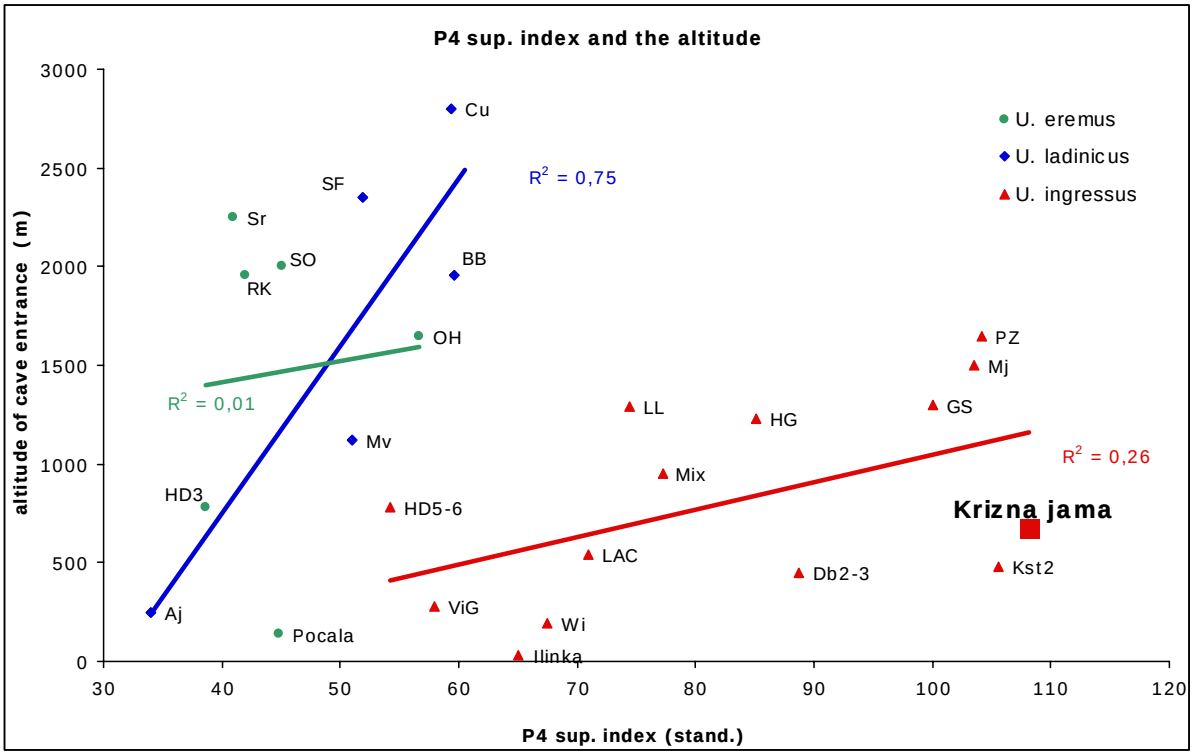


Diagramm 1. Die Höhlenbären der Krizna jama zeigen ein sehr hohes Evolutionsniveau. Die Indices der Prämolaren (hier im Beispiel P4 sup.) korrespondieren nur mit den Werten von anderen Assoziationen von ***Ursus ingressus*** *RABEDER & al. 2004*

Literatur:

RABEDER, G. & Withalm, G. 2001. Die Krizna jama bei Loz im Klassischen Karst. The Krizna jama near Loz in the classic karst. – Exkursion guide to the 7th Internat. cave bear symposium, Trieste

POHAR, V., RABEDER, G. KRALJ, P. & MISIC, M.. 2002. Cave sediments and fossil mammal remains in Krizna jama, Southern Slovenia. In: ROSENDAHL, W. MORGAN, M. et LOPEZ CORREA– Abh. Karst- Höhlenkde. **34:** 49-51, München

RABEDER, G., HOFREITER, M. NAGEL, D. PÄÄBO, S., & WITHALM G. 2003. New taxa of Alpine cave bears (Ursidae, Carnivora). 9ème Symposium International Ours des Cavernes, Entremont-le-Vieux (Savoie, France), poster abstr.: 96, Grenoble.

Saturday, April 18th – *Excursion III: Krapina and Vindija (Croatia)*

Presentation Krapina, cave and museum: guided by I. Karavanic

Presentation Vindija: guided by I. Karavanic, G. Rabeder

Jörg Orschiedt (Hamburg/ Hagen):

Einführung zu Krapina

Bei der Fundstelle handelt es sich um ein verstürztes Felsdach am Hang des Hušnjakovo-Berges, am rechten Ufer der Krapinica, westlich des Ortes Krapina, ca. 42 km nord-nordwestlich von Zagreb in der Hrvatsko Zagorje-Region (46°10´N, 15° 52´O).
Die insgesamt 11 m Sediment enthielten 9 Kulturschichten, die vom Ausgräber Dragutin Gorjanovic-Kramberger zwischen 1899 und 1905 untersucht wurden. Die ursprünglich vorhandenen Sedimente, die sich aus Verwitterungsschutt des überhängenden miozänen Sandsteins gebildet hatten, wurden von Kies, Sand, Lehm und alluvialen Ablagerungen überlagert. Der ursprünglich ca. 12 m hohe Abri selbst wurde vom Bach Krapinica während der Riss-Eiszeit ausgewaschen. Der Bach Krapinica hat sich erst im Verlauf des Holozän 4-6 m tief in die Terrasse eingeschnitten.

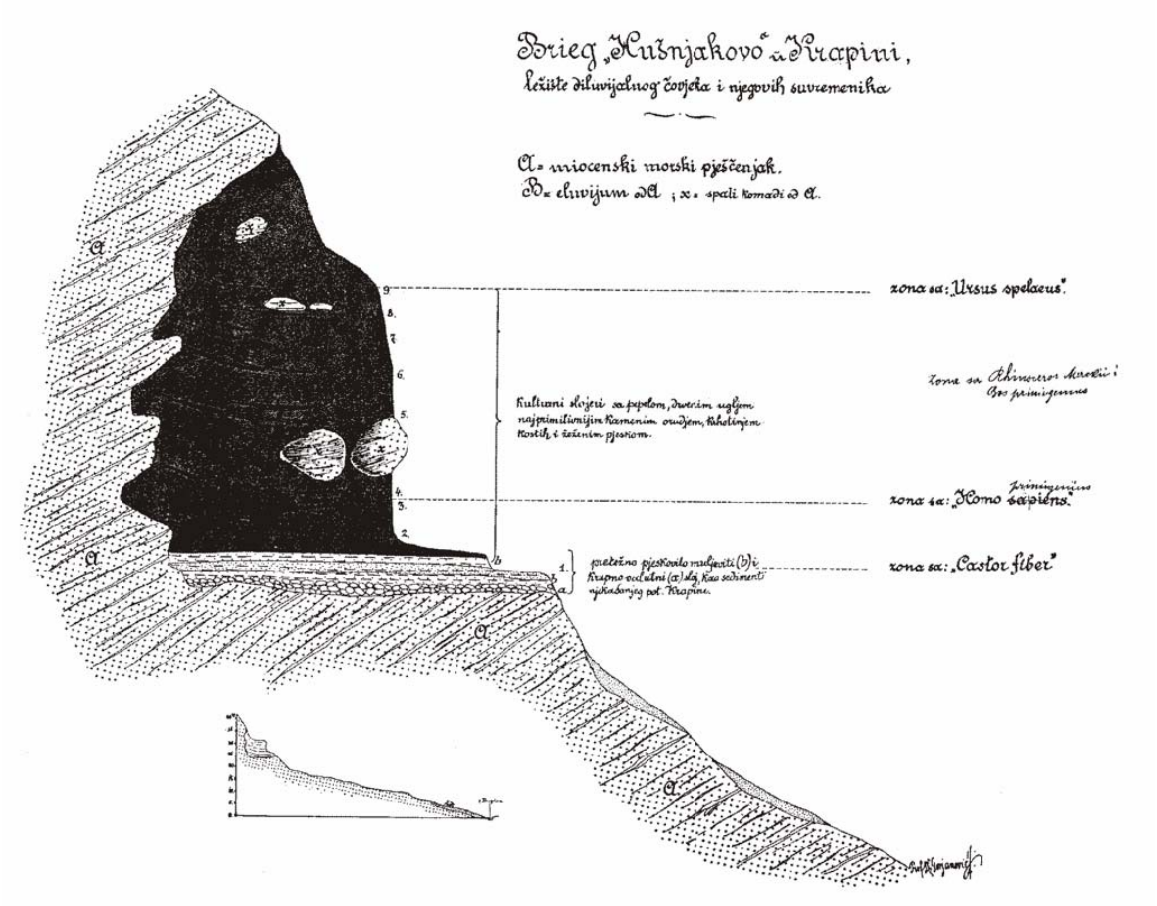


Abb. 1 – Profil Krapina, Stratigraphie der Fundstelle nach Gorjanovic-Kramberger

In der untersten Schicht 1, die aus angeschwemmtem und abgelagertem Bachgeröll und Sand besteht, herrschen Reste des Bibers vor. Die darauf folgenden Schichten 2-4, mit einer Mächtigkeit von 3 m, wurden hauptsächlich durch Verwitterung des Sandsteines gebildet. Auf diesem Schichtpaket liegt eine weitere nur wenige Funde enthaltende, ebenfalls ca. 3 m mächtige Schicht, die große Blöcke der ehemaligen Decke des verstützten Felsdaches enthält.
Nach den in den siebziger Jahren des 20. Jahrhunderts wiederentdeckten Grabungstagebüchern des Ausgräbers lässt sich mit Sicherheit davon ausgehen, dass Menschenreste ebenso wie Faunenreste und Steinartefakte in den Schichten 3 und 4, aber auch in den Schichten 1, 2 und 5-8 enthalten gewesen sind. Lediglich die oberste Schicht 9 enthielt zumindest keine heute noch sicher zuweisbaren menschlichen Reste. Es lassen sich jedoch nur wenige Skelettreste eindeutig einer bestimmten Schicht zuweisen, der Großteil des Materials ist heute nicht mehr zuzuordnen. Die einzelnen Kulturschichten oder Zonen wurden vom Ausgräber nach der jeweils vorherrschenden Faunenrepräsentation benannt. Es ist daher wie bei den Menschenresten davon auszugehen, dass alle Tierarten in den meisten Bereichen der Stratigraphie vorhanden waren, aber mit unterschiedlichen Häufigkeiten auftraten.

Die Analyse der selektiert vorliegenden Fauna ergab eine Vielzahl vor allem von Säugetieren, die jedoch sicherlich nicht alle als Jagdbeute zu interpretieren sind. Die insgesamt dominierende Tierart mit mindestens 30 Individuen stellt der Höhlenbär dar, der beinahe innerhalb der gesamten Schichtsequenz von Schicht 2-9 vertreten ist. Das Auftreten von Karnivoren ist in allen Schichten nachweisbar. Im einzelnen sind folgende Arten vertreten: *Gulo gulo, Canis lupus, Vulpes vulpes, Felis silvestris, Lynx lynx, Pantera pardus* sowie *Crocuta spelea*. Davon treten *Canis lupus* mit mindestens sechs Individuen in den Schichten 5-9 und *Pantera pardus* mit mindestens vier Individuen in den Schichten 1-2 und 7 auf. Die übrigen Arten sind nur mit ein oder zwei Individuen nachweisbar.

Die Fundstelle wurde zu Beginn der Untersuchungen in das Riss-Würm-Interglazial (Eem) eingeordnet. Gorjanovic-Kramberger ging von einer zeitlich verhältnismassig eng begrenzten Deponierungsgeschichte während des Eems aus. Dies wurde sowohl hinsichtlich der chronologischen Einordnung der Fundstelle wie auch hinsichtlich der Ablagerungssequenz in der Folge bestritten. Neuere ESR-Datierungen lassen jedoch heute den Schluss zu, dass die ursprüngliche Vorstellung des Ausgräbers zutrifft. Die ESR-Datierungen von stratifiziertem Material der Schichten 1, 5-6 und 7-9 zeigen eine absolut chronologische Einordnung um 130.000 B.P., am Ende des Isotopenstadiums 6 bzw. am Beginn von Stadium 5e. Dies entspricht dem späten Riss-Glazial bzw. dem Riss-Würm Interglazial.

Aus der Fundstelle liegen ca. 1200 Steinartefakte vor, nur 38 retuschierte Werkzeuge entziehen sich der Einordnung in dieses System. Der größte Teil des Materials besteht aus 784 unretuschierten Abschlägen. Die Werkzeuge kommen in allen von Gorjanovic-Kramberger definierten Schichten vor. Die dominante Werkzeugform ist der Schaber, das Material lässt sich daher typologisch mit einem Charentien vergleichen. Als Rohmaterial diente vor allem lokaler Tuff oder verkieselter Tuff mit 65%. Feuerstein wurde zu 23% verwendet. In erster Linie wurden in Krapina Abschläge zur Werkzeugproduktion hergestellt. Die Levallois-Technik ist in allen Schichten nachweisbar, kommt jedoch häufiger in den unteren Bereichen der Stratigraphie vor. Am häufigsten wurden Flussgerölle verarbeitet.

Aus Krapina liegen fragmentarische Skelettreste von mindestens 23 Individuen (fünf infans, vier juvenilen und 14 erwachsenen Individuen) vor. Nach einer aktuellen Zählung liegen 884 Einzelknochen und 198 Zähne vor. Bei der Revision des gesamten Bestandes an menschlichen und tierischen Resten aus der Fundstelle konnten insgesamt 37 Stücke, die bislang zu den Faunenresten gezählt wurden, neu als menschlich bestimmt werden. Neun ursprünglich als

menschlich bestimmte Fragmente ließen sich dagegen als Faunenreste identifizieren. Weiterhin konnten einige Anpassungen vorgenommen sowie einzelne Bestimmungen modifiziert und korrigiert werden.
Die menschlichen Reste aus Krapina wurden lange Zeit als Beleg für Kannibalismus angesehen. Obwohl diese Ansicht teilweise kritisiert wurde, galten vor allem der fragmentarische Zustand und Manipulationsspuren als Hinweise auf kannibalistische Rituale.
Bei der Nachuntersuchung der Skelettreste wurden in erster Linie die Bruchmuster und die Schnittspuren näher untersucht. Diese Analyse zeigt, dass die Bruchmuster nicht durch menschliche Aktivität hervorgerufen wurden, vielmehr dürften sie sowohl durch Sedimentdruck, vor allem durch Felsstürze und durch Karnivorenverbiss entstanden sein. Die Analyse der Schnittspuren gestaltet sich problematisch, da eine rasterelekronenmikroskopische Untersuchung aufgrund der Überdeckung der Knochen mit Schellack nicht möglich ist. Die makroskopische Analyse zeigt jedoch, dass die Spuren hinsichtlich ihrer Orientierung und der anatomischen Zuordnung nicht mit Schnittspuren übereinstimmen, die bei einer Zerlegung und Entfleischung von Tieren entstehen. In einigen Fällen ließ sich eine rezente Entstehung der Spuren belegen. Tatsächlich sind in zwei Fällen Zerlegungsaktivitäten im Schulterbereich nachweisbar. Das bekannte Kranium 3 weist Schnittspuren im Bereich des Stirnbeins auf, die Schnitte in die Kopfhaut in dieser Region belegen.

Abb. 2 – Kranium Krapina 3 (Foto J. Orschiedt)

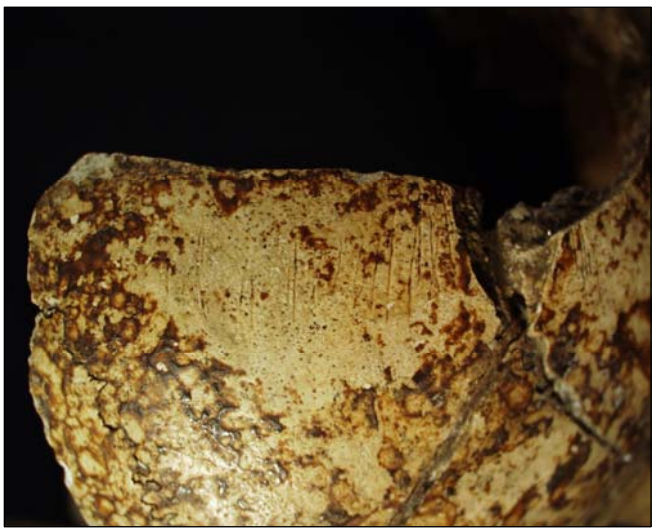


Abb. 3 – Schnittspuren auf dem Frontale von Krapina 3 (Foto J. Orschiedt)

Allerdings ist aufgrund der anatomischen Position und der geringen Länge der Spuren eine Entfernung der Kopfhaut nicht nachweisbar. Der Grund für diese Manipulation erscheint unklar und könnte allenfalls in einem rituellen Kontext zu suchen sein. Ein Hinweis auf Kannibalismus lässt sich jedoch an den menschlichen Resten von Krapina nicht feststellen.

Abb. 4 – Fundstelle Krapina (Foto J. Orschiedt)

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Jörg Orschiedt (Hamburg/ Hagen):

Einführung zu Vindija

Die Höhlenfundstelle von Vindija in Kroatien liegt am Križnjak Berg in der Ravna Gora-Region, einem südöstlichen Ausläufer der Alpen. Bei der Fundstelle handelt es sich um einen großen Höhlenraum von 50 m Tiefe, 28 m Breite und einer Höhe von 10 m. Die Grabungen in der Fundstelle wurden von Mirko Malez im Jahre 1974 begonnen und dauerten bis 1986 an. Dabei wurden über 60 Fragmente menschlicher Skelettreste entdeckt, die dem Mittelpaläolithikum und frühen Jungpaläolithikum zugerechnet werden. Weitere 45 Menschenreste werden in das Epigravettien datiert.

Abb. 1 – Eingang Vindija (Foto J. Orschiedt)

Die Schichtenfolge wird in 14 stratigraphische Einheiten unterteilt. Die Schichtkomplexe F, G und K sind in weitere Schichten unterteilt. Die mittelpaläolithischen Menschenreste stammen aus Schicht G3 und G1, die frühen jungpaläolithischen Reste aus den Schichten Fd und D. Ein Teil dieser Schichtenfolge ist durch kryoklastische Prozesse gestört. Während die Menschenreste aus dem G-Schichtenkomplex den Neandertalern zugewiesen werden können, handelt es sich bei den Fragmenten aus Schicht D morphologisch eindeutig um anatomisch moderne Menschen. Die Skelettreste aus Schicht Fd können nicht eindeutig zugewiesen werden. Die Direktdatierungen einiger menschlicher Reste aus Schicht G1 erbrachten die jüngsten Daten für Neandertaler, die bislang bekannt sind (28 020 ± 360 B.P. und 29 080 ± 400 B.P.). Die Skelettreste aus den G-Schichten befanden sich im vorderen Bereich der Höhle auf einer Fläche von 10 x 10 m. Diese zu ca. 90 % durch Schädelfragmente repräsentierten Menschenreste aus Schicht G sollen Spuren einer intentionellen Zerschlagung und Schnittspuren aufweisen.

Nach Meinung einiger Bearbeiter weist das Skelettmaterial eindeutig Spuren intentioneller Zerschlagung sowie Schnittspuren auf. Nach ihrer Untersuchungen soll der Hauptunterschied zu den Menschenresten von Krapina darin bestehen, dass die Schnittspuren vor allem an den Schädelfragmenten auftreten und nicht nur auf Muskulaturansatzstellen beschränkt sind, sondern dass auch "Kratzspuren" in eher ungewöhnlichen Lokalisierungen vorliegen. Aus diesem Grund werden die Neandertalerreste von Vindija teilweise nicht als Überreste

kannibalistischer Aktivitäten, sondern als Beleg für einen komplexen Totenkult des Neandertalers gewertet.

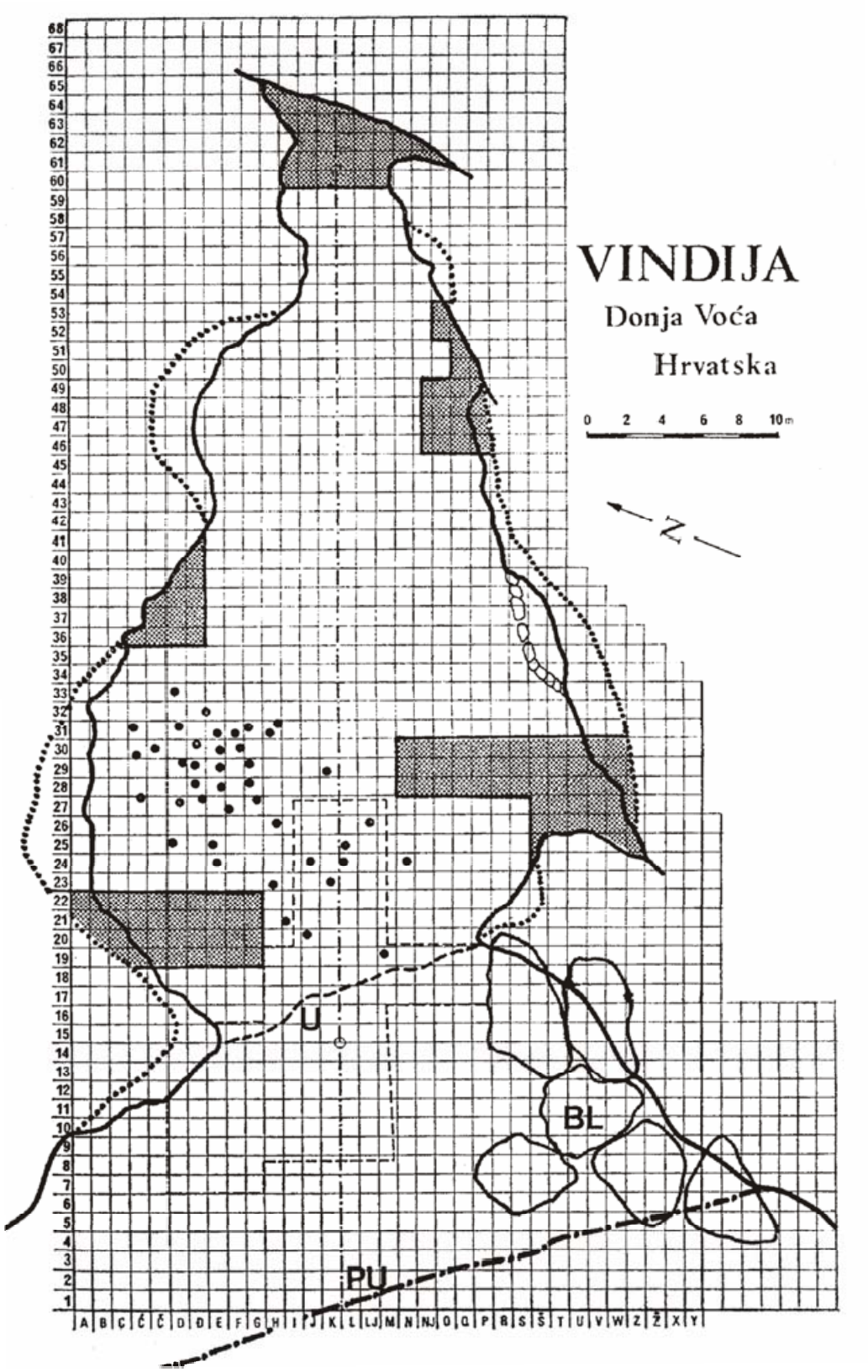

Abb. 2 – Grundriß von Vindija mit Verteilung der menschlichen Reste (schw. Punkte)

Abb. 3 – Schädelfragmente des Neandertalers aus Vindija (Foto J. Orschiedt)

Die Skelettreste wirken in der Substanz sehr hart und kompakt, nur wenige Stücke zeigen Verwitterungsspuren. Die anatomische Repräsentanz der einzelnen Skelettelemente orientiert sich eindeutig an anatomischen Gegebenheiten. Die stabileren und massiveren Regionen sind vorhanden, während fragilere Teile in der Regel fehlen. Alle Skelettelemente sind fragmentiert, lediglich eine Phalanx liegt vollständig vor. Trotz des hohen Fragmentierungsgrades konnten bereits zu einem früheren Zeitpunkt Zusammensetzungen von zwei Mandibulafragmenten sowie von jeweils zwei Parietal- und Frontalfragmenten durchgeführt werden. Jüngst konnte zusätzlich eine Teilkalotte aus mehreren Fragmenten des Frontale und Parietale zusammengefügt werden. Die Schädelfragmente weisen keine perimortalen Bruchmuster und nur seichte teilweise in unterschiedliche Richtungen verlaufende Kratzer auf, die wahrscheinlich durch Verlagerung in dem teilweise als kryoklastischen Schutt bezeichneten Sediment entstanden sind. Auch die Kieferfragmente und die wenigen Bruchstücke des Körperskelettes lassen nur postmortale Beschädigungen erkennen. Lediglich an einem Schädelfragment (Vi 11-1a) liegen Schnittspuren vor. Dies wird auch durch die rasterelekronenmikroskopische Untersuchung bestätigt.
Der Einfluss von Karnivoren an den Skelettresten kann durch das Fehlen von Zahnspuren nicht eindeutig nachgewiesen werden. Allerdings liegen aus dem G-Schichten-Komplex, 23 menschliche Langknochensplitter vor, an denen bei 12 Stücken Bruchmuster nachweisbar sind, die nur am frischen Knochen auftreten. Ein menschlicher Einfluss in Form einer gezielten Zerschlagung ist nicht feststellbar. Es ist daher nicht auszuschließen, dass die betreffenden Langknochen durch Karnivoren frakturiert wurden.

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Bericht zur 50. Tagung der Gesellschaft in Erlangen vom 25.– 29. März 2008

von Thorsten Uthmeier (Köln)

Nachdem die vorangegangene Tagung in Trento (Italien) stattgefunden hatte, traf sich die Hugo Obermaier-Gesellschaft im Jahr 2008 in Erlangen. Bereits in dem Einladungsschreiben war hervorgehoben worden, dass es sich um ein besonderes Jahr handelt, in dem richtungsweisende Stationen nicht nur der Archäologie des Eiszeitalters, sondern auch im Hinblick auf die Gesellschaft ihr Jubiläum feierten. So handelte es sich nicht nur um die 50. Jahrestagung, sondern es jährten sich zugleich die Entdeckungen des Heidelberger Urmenschen, des Neandertalers aus La-Chapelle-aux-Saints und der ersten Schädelknochen aus Weimar-Ehringsdorf zum hundertsten Mal. Ebenso lange zurück lag die Auffindung der Venus von Willendorf in Zuge von Ausgrabungen, an denen auch Hugo Obermaier beteiligt gewesen ist. Sowohl die traditionsreichen Paläolith-Forschungen als auch die Lehre im Fach Ur- und Frühgeschichte an der hiesigen Friedrich Alexander-Universität Erlangen-Nürnberg wurden in der Zeit unmittelbar nach dem 2. Weltkrieg bis heute von Persönlichkeiten maßgeblich beeinflusst, die auch die Obermaier-Gesellschaft mit geprägt haben. Das Erlanger Institut für Ur- und Frühgeschichte, das sich für die diesjährige Einladung verantwortlich zeichnete, sowie die mit dieser Institution verbundenen Grabungsprojekte – die zum Teil Ziel der abschließenden Exkursion waren – wurden nacheinander von L. Zotz, G. Freund und L. Reisch geleitet. Die Exkursion selbst führte die Gesellschaft in eine Region, der seit dem Beginn der Erforschung der Altsteinzeit bis heute durch zahlreiche Fundstellen eine hervorragende Rolle weit über die Grenzen des deutschsprachigen Raums zukommt. Einen festlichen Rahmen für die Tagung boten die Räumlichkeiten des Erlanger Schlosses, in dessen Aula das Vortragsprogramm stattfand, während Posterpräsentation und Empfang im Senatssaal durchgeführt wurden. Ein besonderer Dank gilt den Organisatoren der diesjährigen Veranstaltung rund um Prof. Dr. Ludwig Reisch, Dr. Christian Züchner und Dr. Leif Steguweit. Unterstützt von zahlreichen Helfern haben sie dafür gesorgt haben, dass die durch einen Besuch der Sonderausstellung „Menschen der Eiszeit: Jäger - Handwerker - Künstler“ bereicherte sowie durch eine zweitägige Exkursion in das Altmühltal bzw. die Fränkische Alb abgeschlossene Tagung ein voller Erfolg wurde. Wie bereits bei vergangenen Tagungen, so beeindruckte auch diesmal neben dem thematisch vielseitigen interdisziplinären Programm die hohe Zahl an internationalen Kollegen, die u. a. aus Frankreich, Österreich, Polen und Tschechien nach Erlangen gekommen waren.

Der Tagungsverlauf

Nach dem Grußwort Universitätsleitung der Friedrich Alexander-Universität, die der Dekan der Philosophischen Fakultät und Fachbereich Theologie Prof. Dr. Jens Kulenkampff überbrachte, folgte die feierliche Eröffnung der Tagung sowie die Bekanntgabe der Preisträgerin des Hugo-Obermaier-Förderpreises 2008, Mara-Julia Weber M.A., durch den Präsidenten der Gesellschaft, Prof. Dr. Reisch. Das anschließende Vortragsprogramm wurde mit Beiträgen zum Alt- und Mittelapläolithikum eröffnet. Zunächst sprach Wolfgang Schirmer (Wolkenstein) über das „Alter und sedimentäre Milieu des *Homo heidelbergensis* von Mauer“, gefolgt von Stefan Ertmer (Tübingen) und Thomas Weber (Magdeburg), die mit ihrem Doppelbeitrag „Der mittelpaläolithische Fundplatz Hundisburg (Landkreis Börde, Sachsen-Anhalt) - Ergebnisse der Probegrabungen 2005/06“ und „Hundisburg: alte und neue Funde und das äl-

tere Paläolithikum in Mitteleuropa“ den Blick auf das beginnende Mittelpaläolithikum lenkten. Ebenfalls über einen älteren Abschnitt des Mittelpaläolithikums berichtete Tim Schüler (Weimar) im Rahmen seiner Ausführungen zu „Einhundert Jahre Menschenfunde von Ehringsdorf - Überlegungen zur Fundverteilung im Unteren Travertin“, die die Bedeutung langlebiger Medien zu Dokumentation von Funden und Befunden hervorhoben. Danach folgte ein Vortragsblock, der zum einen chronologisch jüngere, gleichwohl überwiegend mittelpaläolithische Themen behandelte, und zum anderen auf die Exkursion vorbereitete. Eine erste Reihe von Einzelbeiträgen dienten der Zusammenschau der – vor dem Hintergrund jüngst ermittelter absoluter Daten in einem völlig neuen Licht stehenden – Ergebnisse der bisherigen Forschungen an der Höhlenruine Hunas durch Brigitte Hilpert, Dieta Ambros, Ludwig Reisch (alle Erlangen) und Maria Knipping (Hohenheim), die über „25 Jahre ´Neue Grabung´ in der Steinberg-Höhlenruine bei Hunas: Erkenntnisse und Interpretationen“, „Die Berberaffen aus der Steinberg-Höhlenruine bei Hunas: Alte und neue Funde“ sowie „Pollenanalytische Untersuchungen an Sintern der Höhlenruine Hunas“ referierten. Mit dem späten Mittelpaläolithikum sowie dem Übergang vom Mittel- zum Jungpaläolithikum in Bayern befassten sich die Ausführungen von Utz Böhner (Hannover), Jürgen Richter und Thorsten Uthmeier (beide Köln) zum Thema „Neue Forschungen zum späten Mittel- und frühen Jungpaläolithikum im bayerischen Donauraum“. Der erste Tag fand seinen wissenschaftlichen Abschluss in der Eröffnung der Poster-Ausstellung durch Prof. Dr. Ludwig Reisch, dessen Ansprache einen Einblick in die Geschichte der Friedrich Alexander-Universität gab und durch die virtuose Darbietung eines Didgeridoo-Spielers abgerundet wurde. Dieses musikalische Intermezzo, das die Tagungsteilnehmer auf unterhaltsame Weise an die Existenz der nicht im Fundstoff überlieferten Aspekte prähistorischer Jäger und Sammler gemahnte, leitete über zum Empfang im Senatssaal der Universität.

Der zweite Tag stand ganz im Zeichen des Jungpaläolithikums, wobei am Vormittag das diesjährige Schwerpunkt-Thema „Jungpaläolithische Kunst“ den Anfang machte. Einleitend betrachteten Jordi Serengali und Miriam Haidle (beide Tübingen) „Kunst und Ästhetik als Spiegelbild der kulturellen und kognitiven Evolution“. Nachdem Ingmar Braun (Halle/S.) in seinem darauf folgenden Beitrag „Die jungpaläolithische Kleinkunst in Mitteleuropa“ einen Überblick über den dortigen Datenbestand gegeben hatte, diskutierte Sybille Brunn (Mainz) „Eine neue Venusstatuette vom jungpaläolithischen Fundplatz Dolní Vêstonice (Mähren)“. Auch die übrigen Beiträge zum Schwerpunktthema behandelten durchweg verschiedene Aspekte der mobilen Kunst. So erörterten Pablo Arlas, Roberto Ontanón (beide Santander, ESP), Alexandra Güth (Monrepos) und Nicolas Melard (Paris, F) „Die gravierten Plaketten von La Garma (Spanien) - Neue Beiträge zum Fundkontext der paläolithischen Kleinkunst Kantabriens“, Christian Züchner (Erlangen) „Die jungpaläolithische Kleinkunst in der Ur- und Frühgeschichtlichen Sammlung Erlangen“ und wiederum Nicolas Melard (Paris, F) „Bilder, Technik, Kontext - Die gravierten Steine des Magdalénien-Fundplatzes La Marche (Lussac-les-Chateaux, Frankreich)“. Aus einer aktualistischen zoologischen Perspektive heraus erfolgten dann „Vergleichende Betrachtungen der Merkmalsausprägungen und des Verhaltens von Höhlenbär (*Ursus spaelaeus*), Braunbär (*Ursus arctos*) und Eisbär (*Ursus maritimus*)“ durch Wolfgang Zessin (Schwerin). Am Nachmittag wurden die Vorträge zur jungpaläolithischen Kunst durch Überlegungen von Susanne Münzel (Tübingen) zu „Trophäe, Schmuck oder Talisman? Zur Bedeutung des jungpaläolithischen Zahnschmucks auf der Schwäbischen Alb“ abgeschlossen. Im weiteren Verlauf des Nachmittags standen allgemeine Beiträge zum frühen und mittleren Jungpaläolithikum auf dem Programm. So sprachen Leif Steguweit und Ingeborg Hohenester (beide Erlangen) über „Das lithische Inventar der Aurignacien-Fundstelle Alberndorf (Niederösterreich)“, während Thomas Einwögerer und Johanna Ziehaus „Neues zum Besiedlungsmuster der gravettienzeitlichen Fundstelle Krems-Wachtberg (2005-2007), Niederösterreich“ berichteten und „Erste Ergebnisse der artefakt-

morphologischen Analysen der Silices von Krems-Wachtberg (NÖ), Grabung 2005“ bekannt gaben. Mit derselben wichtigen Station des Pavlovien beschäftigte sich der Beitrag von Ludwig Zöller, Ulrich Hambach, Markus Fuchs und Björn Redersen (alle Bayreuth) „Zum Stand der Datierung an der jungpaläolithischen Begräbnisstelle Krems-Wachtberg“, während Mario Küssner (Weimar) „Die späte Altsteinzeit im Einzugsgebiet der Saale – Untersuchungen an ausgewählten Fundstellen“ beleuchtete und damit den Bogen der Vorträge bis in das Magdalénien spannte. Am frühen Abend erhielten die Tagungsteilnehmer durch die gemeinsame Besichtigung der im Stadtmuseum gezeigten Sonderausstellung „Menschen der Eiszeit: Jäger – Handwerker –Künstler“ des Instituts für Ur- und Frühgeschichte Erlangen die seltene Gelegenheit, vieles des zuvor in den Beiträgen Gehörten und Gesehenen am Original nachzuvollziehen. Neben Stücken aus der Erlanger Sammlung in einführenden Vitrinen zur Chronologie, Umwelt, Werkzeugausstattung und Lebensweise prähistorischer Jäger und Sammler war es den Organisatoren der Ausstellung gelungen, mit Kleinplastiken des Pavlovien aus Předmostí, Dolní Věstonice und Brno (Mähren, CZ) weltbekannte Objekte der eiszeitlichen Kunst als Original zu präsentieren. Den außerordentlich gut besuchten öffentlichen Vortrag hielt Prof. Dr. Klaus Schmidt (Erlangen) über „Neue Ergebnisse der Grabungen am Göbekli Tepe (Türkei)“.

Der dritte und letzte Vortragstag war dem Mittel-, Jung- und Spätpaläolithikum sowie dem Neolithikum gewidmet. Den Anfang machte Guido Bataille (Köln), der mit „Kabazi II, Unit II, Level 8 - Ökonomie eines spät-mittelpaläolithischen Fundplatzes auf der Halbinsel Krim“ eine Schlüsselfundstelle des östlichen Mittelpaläolithikums hinsichtlich der dortigen Landnutzungsmuster untersuchte. Thematisch ebenfalls in die Zeit des Neandertalers gehörten die jeweiligen Doppelvorträge von Johann Trabska (Rzeszów, PL) zu „Coloured raw material from Middle Paleolithic Becov site, Czech Republic“ und „Archaeological powders in X-Ray Diffraction analysis: perspectives“ sowie von Darius Bobak, Marta Połłtowicz-Bobak, Beradeta Kufel, Ewa Lisowska und Anna Mikołajczyk (alle Rzeszów, PL) zu „Luboty´n 11 - Eine neue Szeletien-Fundstelle in Oberschlesien (Polen)“ und „The influence of high temperatures on preservation of flint artifacts and its meaning for archaeological research“. Der eher naturwissenschaftliche orientierte Teil des Vormittagsprogramms wurde durch Katsuhiro Sano (Neuwied und Köln) abgeschlossen, dessen „Lithic evidence for Hunting in the Magdalenian at Bois Laitrie Cave, Belgium“ in erster Linie auf Gebrauchsspurenanalysen beruhen. In denselben zeitlichen Abschnitt des Jungpaläolithikums reihte sich der mit Spannung erwartete Beitrag „Neues zur Hamburger Kultur: techno-typologische Aspekte der Steinartefakte“ der diesjährigen Preisträgerin des Hugo Obermaier-Förderpreises, Mara-Julia Weber M.A., ein. Während Andreas Maier und Stephan Heidenreich (beide Köln) im Anschluss daran die „Federmessergruppen in der Westfälischen Tieflandbucht: Die Fundplätze Rietberg und Salzkotten-Thüle“ vorstellten, präsentierten Jordi Serengali, Klaus Emde, Hannes Napierala, Joaquim Soler, Phillip Woerz und Thomas Terberger (Tübingen/Greifswald) „Neue Forschungen zum Jungpaläolithikum in Südhessen“. Nach der Mittagspause folgten Vorträge zu „Geoarchäologische Surveys im Vulkangebiet des Mt. Hatis (Kotayk-Plateau, Armenien)“ von Dieter Schäfer und Burkhard Weishaupl (beide Innsbruck), zu „Auswirkungen des spätglazialen Klimawandels auf die Rentierjagd am Kesslerloch, Schweiz“ von Hannes Napierala (Tübingen), über das Thema „Mesolithischer Hornsteinbergbau im Kromauer Wald, Südmähren“ von Martin Oliva (Brno, CZ), und über „Geoarchäologische Untersuchung der frühmesolithischen Fundstelle bei Haverbeck (Ldkr. Soltau-Fallingbostel; Lüneburger Heide)“ von Johann Friedrich Tolksdorf (Marburg). Nach einer kurzen Pause endete das Programm mit Vorträgen folgender Referenten: Renate Heckendorf (Hamburg) zu „Verwitterungsbedingte Veränderungen an südmarokkanischen Petroglyphen“, Edith Schmidt (Freiburg/Br.) über „Insektenreste aus der Horgener Siedlung Torwiesen II (Federseemoor bei Bad Buchau,

Oberschwaben)“ und schließlich Clemens Pasda (Jena) mit einem Beitrag zu „Speckstein und Karibu - Prähistorische und historische Ressourcennutzung in Grönland“.

Posterpräsentation

Wie bereits in den letzten Jahren, so wurde auch die diesmal die Möglichkeit, durch den Besuch der Posterpräsentation Informationen zu aktuellen Forschungen mit den Autoren zu diskutieren, von nahezu allen Tagungsteilnehmern wahrgenommen. Von folgenden Kolleginnen und Kollegen waren Poster, die in Teilen Themen aus den Vorträgen vertiefend aufgriffen, zu sehen: Walfried Blume (Plate), Michael Brandl (Wien), Eva-Maria Christ, Carolin Czylok, Carolin Jauck, Jasmin Schlichting und Frauke Nordmann (alle Erlangen), Matt Gatton (Louisville, USA), Gerd Elvers (Fürth), Harald Floss, Christian Hoyer und Andreas Taler (alle Tübingen), Petr Neruda und Zdeňka Nerudova (beide Brno, CZ), Petr Neruda, Martina Galetova und G. Dreslerova (all Brno, CZ), Isabell Schmidt (Köln), Elaine Turner (Neuwied), R. P. Jennings (Oxford), F. Giles Pacheto (Cadíz), R.N.E. Barton, S.N. Collcut (beide Oxford), R. Gale (London), C.P. Gleed-Owen (Bournemouth), J. M. Gutiérrez López (Cadíz), T. F. G. Higham, A. Parker, Price (beide Oxford), E. Rodes (Manchester), A. Santiago Perez (Cadíz) und J. L. Schweninger (Oxford), Christian Zeeden, Ulrich Hambach , Michael Hark und Ludwig Zöller (Bayreuth).

Mitgliedeversammlung der Gesellschaft

Die Mitgliederversammlung fand am 27.03.2008 statt und begann mit dem Bericht des Präsidenten. Nach dem Gedenken an die im abgelaufenen Geschäftsjahr verstorbenen Mitglieder konnte Dr. Werner Müller stellvertretend für das neue Herausgebergremium das Erscheinen des QUARTÄR-Bandes 55 bekannt geben. Damit war ein weiterer wichtiger Schritt in der Neuorganisation der Zeitschriftenreihe der Gesellschaft erfolgreich vollzogen, die im Jahr zuvor mit der Übertragung der redaktionellen Arbeit an Dr. Miriam Haidle, Dr. Werner Müller, Dr. Martin Street und Prof. Dr. G.-C. Weniger begonnen worden war. Die in einem neuen Layout mit teils farbigen Abbildungen ausgestatteten QUARTÄR-Bände werden jetzt jährlich mit Aufsätzen in deutscher oder englischer Sprache erscheinen, wobei die Manuskripte zu den Kategorien „Originalarbeiten“, „Übersichtsarbeiten“ und „Kurzmitteilungen“ zuvor von zwei Gutachtern geprüft werden. Allen Mitgliedern des Herausgebergremiums wurde durch lang anhaltenden Applaus von allen Seiten herzlichst gedankt. Einen weiteren wichtigen Punkt stellte die zur Abstimmung gestellte Änderung der Satzung der Gesellschaft dar, die durch Beschluss der Mitgliederversammlung angenommen wurde. Nachdem die in der Satzung festgelegte Amtsperiode von 3 Jahren verstrichen war, standen gegen Ende der Mitgliederversammlung Neuwahlen zum Vorstand an. Hierbei galt es vor allem, den scheidenden Präsidenten, Prof. Dr. Ludwig Reisch, zu ersetzen, der seit 1983 Mitglied des Vorstandes war und in den letzten Jahren die Geschicke der Gesellschaft an dessen Spitze geleitet hatte. Der Vorstand setzt sich nun wie folgt zusammen: Dr. Christine Neugebauer-Maresch (Präsidentin), PD Dr. Thomas Terberger (Vizepräsident), Dr. Leif Steguweit (Schriftführer), Dr. Maria Knipping (Schatzmeisterin), Dr. Werner Müller (Beisitzer) und PD Dr. Thorsten Uthmeier (Beisitzer). Dem Vorstand steht ein Beirat zur Seite, der sich aus den nachstehenden Mitgliedern zusammensetzt: Dr. Doris Döppes, Dr. Miriam N. Haidle, Prof. Dr. Jürgen Richter, Prof. Dr. Dieter Schäfer, Dr. Elaine Turner, Prof. Dr. Gerd-Christian Weniger sowie Prof. Dr. Ludwig Zöller. Zugleich wurde beschlossen, den Beirat stärker in die Arbeiten der Gesellschaft einzubinden und etwa mit der Prüfung der eingegangenen Vorschläge für Tagungsvorträge oder Poster zu beauftragen.

Exkursionen

Der erste Exkursionstag führte zunächst in das Untere Altmühltal, wo Prof. Dr. Ludwig Reisch den in zwei Gruppen aufgeteilten Teilnehmern die Schichtenfolge der Sesselfelsgrotte in einem ausführlichen und informativen Vortrag referierte. Aus dieser für die archäologische Gliederung des jungpleistozänen Mittelpaläolithikums Mitteleuropas so außergewöhnlich wichtigen 7 Meter mächtigen Stratigraphie konnten unter der Leitung von Lothar Zotz (1899-1967) und Gisela Freund aus nahezu 25 archäologischen Horizonten fast 100.000 Artefakte des Mittel- und Jungpaläolithikums geborgen werden. Neben der umfangreichen Fauna sind ferner die Überreste von nicht weniger als drei Neandertalern besonders hervorzuheben. Verfolgt man die wesentlichen Merkmale der Stratigraphie vom Liegenden zum Hangenden, so ergibt sich zuunterst eine Abfolge von zahlreichen Moustérien-Horizonten in den so genannten „Unteren Schichten", die mit wärmeliebenden Mollusken in interstadiale Phasen am Beginn der letzten Kaltzeit gestellt werden. Darüber folgt mit den „Nagetierschichten" ein 1 m mächtiges Sedimentpaket, das zwar keine Artefakte, wohl aber große Mengen an Kleinsäugerresten beinhaltet. Letztere erlauben eine Gleichsetzung mit dem 1. Kältemaximum der letzten Kaltzeit. Nach diesem kulturellen Hiatus setzt die Kulturabfolge darüber mit den überaus reichen Fundschichten des Micoquien aus dem „G-Schichten-Komplex" wieder ein. Für die ungewöhnlich gut erhaltenen, geringmächtigen archäologischen Horizonte, die teils als echte „living floors" vorliegen, wurde eine Zeitstellung kurz nach dem 1. Kältemaximum wahrscheinlich gemacht. Den Abschluss des mittelpaläolithischen Profilabschnitts bildet die Schicht E3 mit einem Moustérien. Aus dem älteren Jungpaläolithikum sind nur wenige Artefakte des Gravettien vorhanden. Weitaus aufschlussreicher sind die Inventare des Magdalénien, die in Schuttschichten dem sterilen Löss des 2. Kältemaximums aufliegen, bevor große Blöcke die Schichtenfolge nach oben hin abschließen.

Auch am zweiten Haltepunkt, dem unmittelbar der Sesselfelsgrotte benachbarten Abri I „Im Dorf" übernahm L. Reisch die Führung der Exkursion. Die Fundstelle hat aufgrund der Fundumstände nicht die Rolle in der Erforschung des bayerischen Jungpaläolithikums gespielt, die ihr eigentlich hätte zukommen können. In den durch verschiedenfarbige Feinmaterialien unterschiedenen Schuttschichten des Abris haben wohl ursprünglich zwei archäologische Horizonte vorgelegen, die zu trennen bei verschiedenen Grabungen nicht gelungen ist. Neben einer Feuerstelle und etwa 1500 Silices muss vor allem das Vorliegen einer Elfenbeinschaufel erwähnt werden. Dieses Objekt diente zusammen mit einer Gravettespitze und rückengestumpften Lamellen als wichtigstes Argument für eine Zuweisung zu einem Pavlovien. Nachdem aber Rentierreste mit den charakteristischen Rillen der Spangewinnung vorliegen, kann mittlerweile nicht ausgeschlossen werden, dass auch die „Elfenbeinschaufel" ein Reststück dieser Bearbeitungstechnik ist und somit auch eine jüngere Zeitstellung in Frage kommt.

In dem aus fünf Etagen bestehenden System der Klausenhöhlen bei Neuessing führte Dr. Christian Züchner. Während die Untere Klause bereits Mitte des 19. Jahrhunderts überwiegend ausgeräumt war, erbrachte die über einen Steig zu erreichende Klausennische neben einem Moustérien vor allem das eponyme Inventar für das „Micoquien von Typ Klausennische" mit seiner besonderen Keilmesserform. Über zwei Eingänge ist die darüber liegende Mittlere Klause zugänglich, in der neben wenigen mittelpaläolithischen Steinartefakten und einem Magdalénien, dass sich vor allem durch eine reiche Knochen-, Geweih- und Elfenbeinindustrie auszeichnet, eine mit viel Rötel gefärbte Bestattung eines *Homo sapiens* auffällt, die nach ein C14-Alter von 18.600 Jahren aufweist. Die Mittlere Klause ist durch einen Kamin mit der Oberen Klause verbunden, aus der eine längere Schichtenfolge dokumentiert ist, in

der neben einem späten Mittelpaläolithikum zwei Magdalénienschichten sowie neolithische Straten vorgelegen haben.

Am Ende des ersten Exkursionstages erreichten die Teilnehmer das Hornsteinbergwerk von Abensberg-Arnhofen, wo bis in das Jahr 2007Ausgrabungen des Bayerischen Landesamtes für Denkmalpflege, der Kreisarchäologie Kelheim und des Instituts für Ur- und Frühgeschichte der Universität zu Köln durchgeführt wurden. Die kenntnisreichen Ausführungen durch den langjährigen Ausgräber des Platzes, Dr. Michael Rind, ließen die Bergwerkstätigkeiten der Bauern des frühen und mittleren Neolithikums lebendig werden. In bis zu 8 m tiefen, kaum schulterbreiten Schächten wurde das Rohmaterial überwiegend als Platten untertägig abgebaut. Bis heute konnten 650 verfüllte Schächte dokumentiert werden, wobei Luftbilder zeigen, dass es sich wohl um ein vielfach größeres Abbauareal handelt, dass aus bis zu 20.000 Schächten bestanden haben könnte. Auch wenn die Verbreitung des Abensberg-Arnhofener Hornsteins bis nach Österreich und der Tschechischen Republik reicht, wird neuerdings diskutiert, ob die Menschen auch aus größeren Entfernungen an das Bergwerk kamen, um sich von den Lokalgrupen das begehrte Material zu beschaffen.

Der vielleicht eindrucksvollste Punkt des zweiten Tages war die Höhlenruine Hunas. Die bei ihrer Entdeckung weitgehend zerstörte Höhle wurde 1956 bis 1964 durch F. Heller und ab 1983 unter der Leitung von L. Reisch untersucht. Nachdem zunächst von einer mittelpleistozänen Zeitstellung ausgegangen worden war, belegen neue Datierungen des basalen Sinters mit einem *terminus post quem* von 100.000 Jahren eine spätere, letzt-kaltzeitliche Position. Aus der 15 m mächtigen, durch zahlreiche Klimawechsel gekennzeichneten Abfolge konnten neben umfangreichen Faunenresten und Pollen auch Spuren des Menschen nachgewiesen werden. Seine überragende Bedeutung verdankt der Fundplatz jedoch nicht allein der Tatsache, dass neben Steinartefakten der Backenzahn eines Neandertalers vorliegt, sondern auch dem Umstand, dass mit dem Berberaffen eine Tierart nachgewiesen ist, die zuvor kaum während des Würm in Mitteleuropa vermutet worden wäre. Den Abschluss der wiederum sehr erfolgreichen und durch die Organisatoren bestens vorbereiteten 50. Tagung der Gesellschaft bildeten die zu Fuß durch die reizvolle Landschaft der Fränkischen Schweiz führenden Besuche des Hohlsteins, des Pottensteins und des Hasenlochs.

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