

## Seventh Annual Meeting of the European Society for the Study of Human Evolution

The annual conference of the European Society for the Study of Human Evolution (ESHE) took place in Leiden, Netherlands, from the 21<sup>st</sup> to the 23<sup>rd</sup> of September, 2017. The venue was the Stadsgehoorzaal, an historic concert hall. A total of 62 talks and 148 posters were presented to 355 registered attendees. The society now includes 402 professional and student members.

Before the conference, the attendees had the opportunity to take part in an “Evan Toolbox” training day held by Cinzia Fornai (Vienna), Paul O’Higgins (York) and Gerhard W. Weber (Vienna), where V 1.72 of the software was presented. As in past years, ESHE supported student research by providing travel grants to 16 students and hosting competitions for the best poster and Pecha Kucha talk. The poster prize was awarded to Judith Beier (Tübingen) for her assessment of cranial trauma frequencies among Neanderthals and Upper Paleolithic humans. Contradicting previous claims, Beier and colleagues found no differences in frequencies between the species. Andrew Sorensen (Leiden) presented the best Pecha Kucha, which featured his work on late Neanderthal use of pyrite and Mousterian of Acheulean tradition (MTA) bifaces as a fire-making toolkit.

On the evening of 21 September, the public lecture was held in the central hall of the Rijksmuseum van Oudheden. The Temple of Tafteh provided a backdrop for Marie Soressi (Leiden), who presented an engaging and memorable synthesis of the current state of research on Neanderthals in Europe and their relationship to modern humans. Both, she argued, had multi-layered identities – not unlike a Dutch tulip bulb – composed of outside appearances, behaviors, physiology, and anatomy that can be studied from archeological, genetic and paleoanthropological perspectives.

The three days of presentations commenced on 22 September. Wide varieties of different subjects during both the podium and poster sessions were presented, highlighting again the major relevance of conducting research using an interdisciplinary approach. Some talks focused on the development of new methods that have the potential to address existing problems. Viviane Slon (MPI EVA) explained how it is now possible to extract ancient human DNA from sediment samples. Thomas Higham (Oxford) and colleagues demonstrated the application of ZooMS to determine the species of morphological undiagnostic bone fragments, successfully identifying new human fossils from Vinjija and Denisova caves. Frido Welker (MPI EVA) and coauthors presented new developments from proteome research and showed how the extraction and analysis of proteins from dentine reveals

phylogenetic insights. Alejandra Ortiz (Arizona St.) and colleagues, applying geometric morphometrics (GM) and analyses of dental nonmetric traits, demonstrated that the internal surface of the mesial marginal ridge can be used to distinguish between Ponginae and Homininae. Tanya Smith (Griffith, Harvard) showed how to use the ratio of barium to calcium in teeth along with incremental growth lines to detect and determine the age of dietary shifts such as those that occur during the nursing-weaning transition. Smith documented that in orangutans lactation reflects seasonal resource availability. Similar work by Susanne Haupt (ROCHEE) and colleagues explored evidence of seasonal fluctuations in the composition and role of breast milk in the diet of infant *Homo erectus*. Their study, which targeted isotope composition in teeth from the Sangiran Formation, culminated in a series of seasonal “menus.”

Other new research on the topics of diet, paleoecology, and resource exploitation also featured work by students. Oliver Paine (University of Colorado) and colleagues presented an in-depth study of C4 vegetation, which demonstrated more diverse nutritional benefits than previously had been assumed. Emma Loftus (Oxford) and colleagues compared and contrasted patterns of shellfish exploitation in coastal South African sites of different ages. Their analyses, which used oxygen isotopes in gastropod opercula to reconstruct sea-surface temperatures, suggested more warm-season exploitation during the MSA and cool-season exploitation in the LSA.

Experimentation, use-wear analysis, and techno-typology brought outstanding new insights into Paleolithic technological behaviors and physical movements. Paul Kozowyk (Leiden) and colleagues proved by experimental comparisons that Neanderthals systematically used and controlled fire to intentionally produce adhesives from tar by burning birch bark at a constant temperature of 150°C. Noora Taipale (Liège) and colleagues combined functional and experimental parallels to demonstrate that tanged points represent a unique and advanced weapon design in the hunting technologies of the Early Gravettian. Alastair Key (Kent) presented his preliminary results from an empirically based study with two experimental approaches, using modern human subjects to analyze the development of different grips of the hand correlating with technological traits of Lower Palaeolithic tools. David Raichlen and Adam Gordon (University of Arizona and University of New York) compared fossil footprints from Laetoli to footprints artificially generated by humans walking either upright or with a bent knee and hip. Quantifying measurements led them to conclude that the Laetoli footprints are the oldest direct evidence of bipedalism.

Several authors proposed new estimations of the divergence time between modern humans and Neanderthals, all agreeing that the split probably happened earlier than previously thought. Thanks to mitochondrial DNA (mtDNA) extracted from a Neanderthal femur from Hohlenstein-Stadel cave, Cosimo Posth (MPI SHH) and coauthors identified a gene-flow event into Neanderthals that took place before ~270 ka. This finding corroborates the notion that split time based on mtDNA is biased by the gene flow event, which favors use of nuclear DNA as a molecular clock. Accordingly, they calculated the split at ~700 ka. Maria Martinon-Torres (London) presented a comparative study of dental characteristics of *H. antecessor* teeth. Because some traits are exclusively shared with Neanderthals, she concluded that *H. antecessor* might be close to the node of divergence between *H. sapiens* and *H. neanderthalensis*. Aida Gómez-Robles (London) analyzed the dental morphology of the Sima de los Huesos fossils to model evolutionary change rates across lineages. Her results point to a last common ancestor of Neanderthals and modern humans predating 700 ka, conforming to the divergence time proposed by Posth and colleagues.

Two talks proposed modeling approaches as a means of gaining insight into the extinction and dispersal of past humans. Krist Vaesen (Leiden) and colleagues assessed the role of inbreeding and Allee-effects on small population sizes among Neanderthals. Arguing against marked differences or competitive interactions between Neanderthals and modern humans, they showed that small population sizes might have been sufficient to result in Neanderthal extinction. Paul Bons (Tübingen) and colleagues developed a stochastic model to investigate the origin and diffusion of beneficial genetic and/or cultural traits across the globe. The team found that an African origin of expansion waves of modern humans is the most probable scenario.

Without a good chronology, it is not possible to make inferences about human evolution. For this reason, the 2017 talks and posters featured a wide variety of dating methods and their applications to Pleistocene contexts. Uranium-series analyses were central to the paper presented by Jacques Jaubert (Bordeaux) and colleagues, who studied structures composed of stalagmites and capped with combustion features inside Bruniquel Cave. Dating of stalagmite growth and postdepositional capping crusts provided ages for construction of 180–174 ka BP, making this the oldest evidence of deep cave use by Neanderthals. Two posters on the topic of electron spin resonance dating were presented by Ranier Grün and Matthieu Duval (ARCHE) and colleagues, the latter raising concern about the significant impacts of  $\mu$ -CT scanning on the equivalent dose in tooth enamel. In the world of radiocarbon, Thibault Devièse (Oxford) and colleagues provided new and older dates for the Vindija Cave hominins using hydroxyproline, a single amino acid extracted from bone. Their results call into question the late survival of Neanderthals in the region. Gianpiero di Maida (Kiel) also challenged previous ages, dating the “Aurignacian” faunal and human remains from Fontana Nuova to the Mesolithic period. Sahra Talamo (MPI-EVA) and colleagues put out a call for subfossil trees to improve radiocarbon calibration for ages in the range of 15–50 ka BP.

Newly excavated sites were reported from Central Asia and Europe. Moving from east to west, Nicolas Zwyns (Davis) and colleagues argued that evidence from the new Initial Upper Palaeolithic site of Tolbor 16 in Mongolia supports the existence of an early northern route of human dispersal. T. Bence Viola (Toronto) and colleagues presented the new cave of Chagyrskaya, an Altai Mountain site. Chagyrskaya yielded a very well-preserved assemblage of 75 hominin fragments from at least five individuals with Neanderthal features, plus a rich record of Middle Paleolithic industry and faunal remains. Daniel Adler (Connecticut) and colleagues described Nor Geshi 1, a newly found open-air site in Armenia bearing a complete stratigraphy from the MIS-11 to MIS-9 with a transitional sequence from bifacial to Levallois technology. In Europe, Marco Peresani (Ferrara) and colleagues reported a new Italian Uluzzian site, Riparo del Broion. Its proximity to Grotta di Fumane and other iconic Uluzzian sites provides an opportunity to address the roots of the technocomplex with respect to Mousterian lithic technologies. The authors concluded that the Uluzzian cannot be viewed as a proxy for anatomically modern humans. Antonin Tomasso (Liège) and colleagues reported unprecedented insights into hunting technologies during the Last Glacial Maximum in southeastern France with the remarkable find of a hafted tool composed of barbed points. This tool had degraded *in-situ* at the horse butchering site of Les Près de Laure.

During the conference, the ESHE board election for new board members and board officers took place. All the candidates were elected. A list of new board members and officers can be found at <http://www.eshe.eu/aboutus.html>

On 24 September, conference participants were able to see the famous Dubois/Trinil collection in a private exhibit at the Naturalis Biodiversity Center. The exhibit included the famous skullcap, both femura, a molar, engraved shells, and an original manuscript from Dubois, as well as some faunal remains. The closing party of the meeting was held at the Rijkmuseum Van Oudheden, where guests enjoyed a rich buffet and drinks in a stunning setting.

The 8<sup>th</sup> annual meeting will take place in Faro, Portugal, from September 13–16<sup>th</sup>, 2018. Further information, including the 2017 and previous editions of the abstract volumes, can be found online at [www.eshe.eu](http://www.eshe.eu)

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