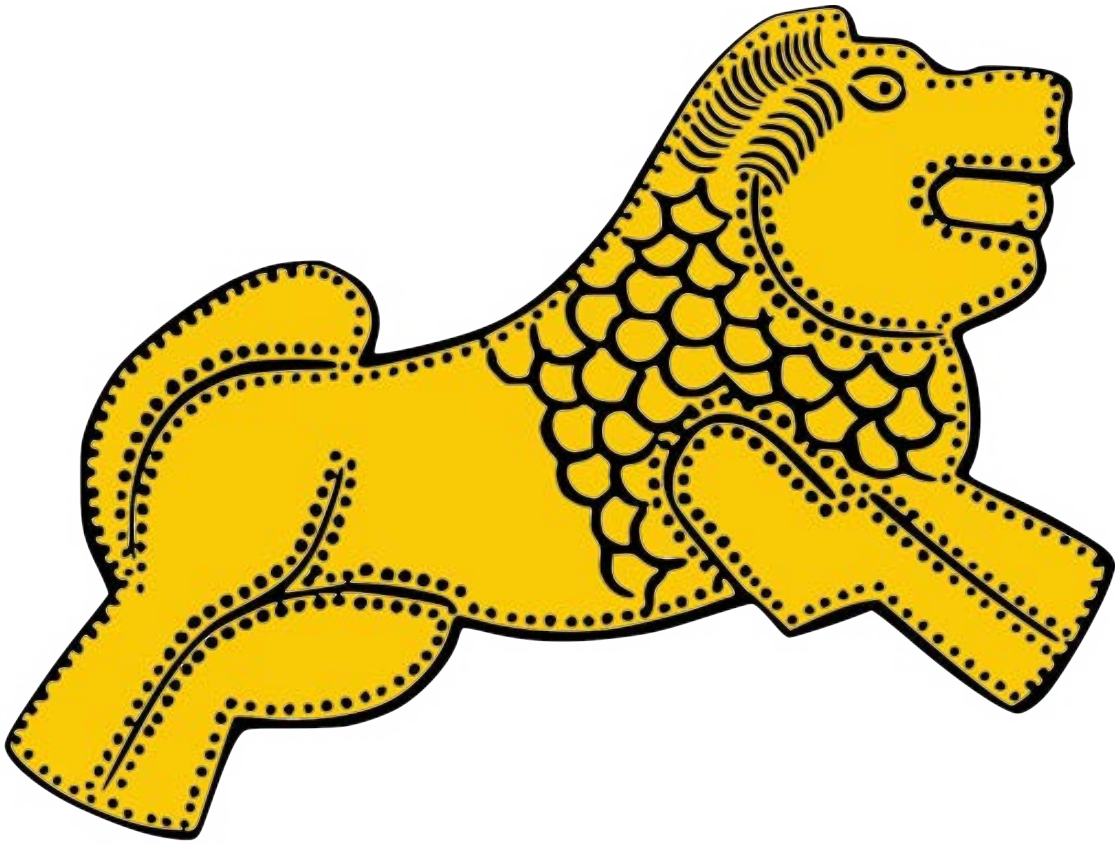
ICAZ Working Group

„Archaeozoology of Southwest Asia and Adjacent Areas“



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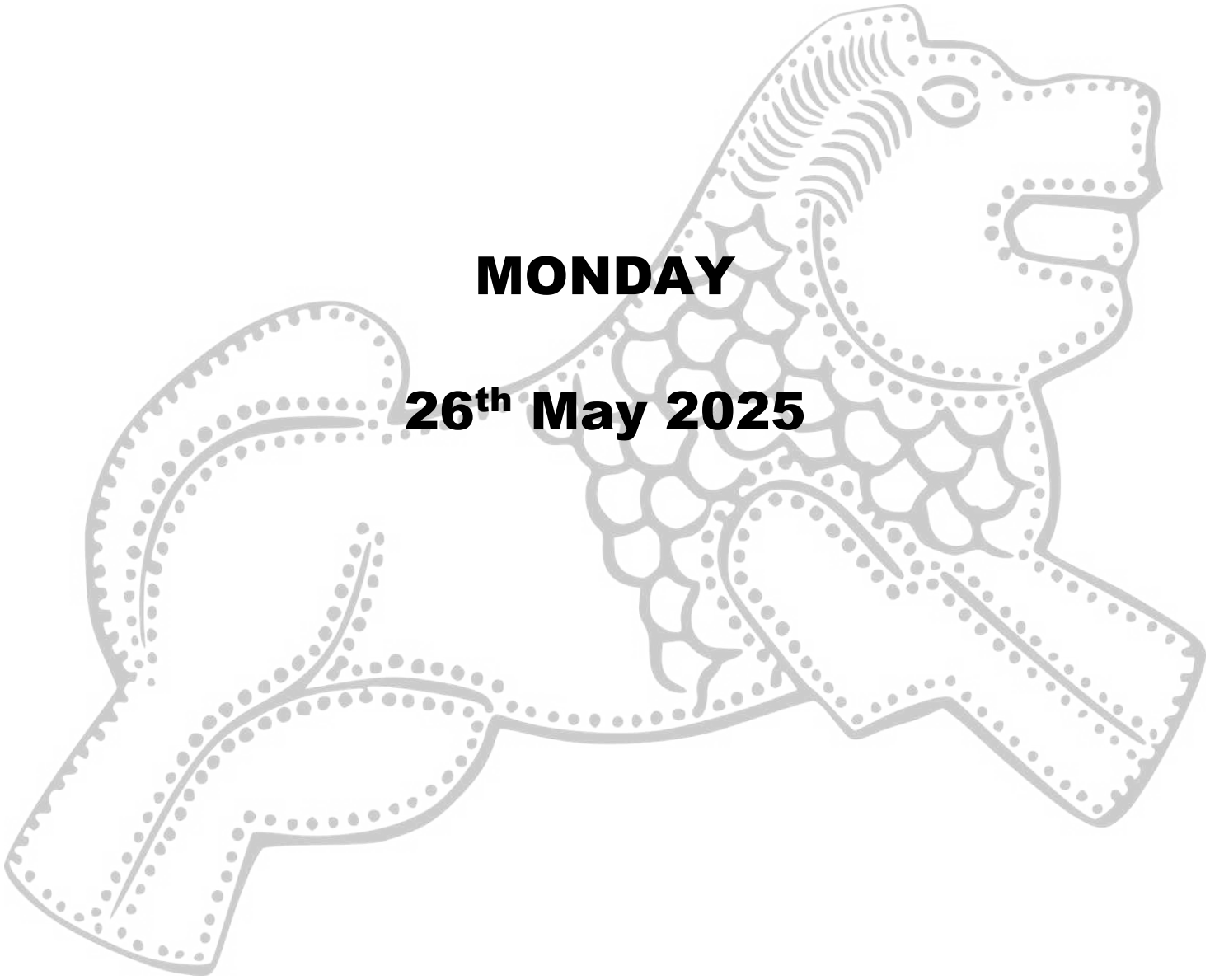
ASWA XVIth International meeting

25-28 May Munich (Germany)

Abstract Book

MONDAY

26th May 2025



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Why so Many? Tortoise Exploitation at Nesher Ramla, a Middle Paleolithic Short-Term Campsite in Israel

26th May

10:20 - 10:40

ID: 117

*Zohar Turgeman-Yaffe[1,2], Yossi Zaidner[3], Reuven Yeshurun[1]

1: Zinman Institute of Archaeology, School of Archaeology and Maritime Cultures, University of Haifa, Haifa, Israel

2: Israel Antiquities Authority, Northern Region, Israel

3: Institute of Archaeology, Hebrew University of Jerusalem, Jerusalem, Israel

*Presenting author (zoharla4e@gmail.com)

Nesher Ramla (NR), dated to the Middle Paleolithic, is an open-air site in central Israel, situated inside a karstic sinkhole and featuring an 8-meter-thick accumulation of *in situ* human activity in six stratigraphic units (VI–I). The lower sequence (units VI–III) contains combustion features, and dense accumulations of flint artifacts, groundstone tools, and faunal remains. Here, the spur-thighed tortoise (*Testudo graeca*) is the most represented taxon, reaching 31%–67% of NISP, followed by aurochs (*Bos primigenius*). Other sites in the region do not attain such high tortoise abundance. MP people probably used the site as a camp while hunting, butchering, processing, and partially consuming aurochs. Given the large quantities of meat available in this scenario, why are there so many tortoises? How did they get there and why? We present a zooarchaeological and taphonomic study of the NR tortoise remains. Cut- and percussion marks, burning patterns, and comparison to natural tortoise accumulation indicate that humans collected, processed, and consumed tens of individual tortoises. The body size of the NR tortoises was reconstructed by the humerus SD measurements, indicating that they are larger, on average, than other Levantine MP tortoises and larger than their geographic location predicts.

Tortoise capture and consumption were likely simultaneous with intensive aurochs processing at the site, suggesting tortoises were seen as more than a supplement when other resources were unavailable. Past ethnographic works showed that tortoises were collected by women and children, assuming this is the case in NR, it may point to the presence of a complete group and a higher mobility pattern. This is further shown by the large body size of the NR tortoises, which argue against overharvesting and might suggest that the site was used for a short-term activity. This activity may have taken place in the spring and summer months when the larger females are more active and therefore more commonly captured.

Keywords: *Middle Palaeolithic, Levant, Tortoises*

Bones from the Hearth: Spatial Taphonomy Across the Early Upper Paleolithic Sequence of Manot Cave, Israel

26th May
10:40 - 11:00
ID: 141

*Catherine Ujma[1], Ofer Marder[2], Omry Barzilai[3], Israel Hershkovitz[4,5], Berna, Francesco[6, 7], Maayan Shemer[8,9], Lotan Edeltin[2], Reuven Yeshurun[1]

1: Zinman Institute of Archaeology, School of Archaeology and Maritime Cultures, University of Haifa, Mt. Carmel, Haifa, Israel

2: Department of Archaeology, Ben-Gurion University of the Negev, Beer Sheva, Israel

3: Material Culture PaleoLab, the Leon Recanati Institute for Maritime Studies, School of Archaeology and Maritime Cultures, University of Haifa, Mt. Carmel, Haifa, Israel

4: Department of Anatomy and Anthropology, School of Medicine, Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel

5: The Dan David Center for Human Evolution and Biohistory Research, Tel Aviv University, Tel Aviv, Israel

6: Department of Archaeology, Simon Fraser University, Burnaby, Canada

7: Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, Università di Siena, Siena, Italy

8: Department of Anthropology, Yale University, New Haven, CT, USA

9: Department of Anthropology, University of Connecticut, Storrs, CT, USA

*Presenting author (Cmujma@gmail.com)

Spatial analysis of prehistoric sites has demonstrated that camp organization centers around hearths, which served as communal spaces for increased social interaction and the transmission of knowledge. While hearth-centric spatial analyses are vital to understanding Paleolithic periods, the Early Upper Paleolithic (EUP) of the southern Levant is lacking in such studies, leaving questions of camp organization and occupation intensity unanswered.

This study examines camp organization during the EUP through a zooarchaeologically focused spatial analysis, using faunal remains from Manot Cave. Area E of the site represents the primary activity area, revealing a well-stratified sequence spanning three phases: Phase 3 (~40–36.5 kyr cal BP), Phase 2 (Levantine Aurignacian, 37.5–36.0 kyr cal BP), and Phase 1 (Atlitian, 34.5–33.1 kyr cal BP). Each phase contains well-preserved living surfaces, rich with artifacts and at least one in-situ hearth. From these layers, we selected a stratigraphically secure sample for spatial analysis of faunal remains. Additionally, we included previously analyzed lithics (not spatially analyzed) to assess whether faunal and lithic distributions reveal similar patterns.

By analyzing the spatial distribution of faunal remains and integrating their taphonomic attributes, we test the hypothesis that their distribution in relation to hearths reflects distinct and repeated patterns of camp organization. The faunal assemblage is dominated by ungulates, mostly mountain gazelle (*Gazella gazella*), with notable contributions from Mesopotamian fallow deer (*Dama mesopotamica*), and small game, including rock pigeon (*Columba livia*), and tortoises (*Testudo graeca*). Taphonomic analysis revealed anthropogenic (e.g., cutmarks, worked bone), biogenic (e.g., carnivore and rodent gnawing), and abiotic (trampling striations, weathering) modifications.

Analyzing the spatial distribution of faunal remains around the hearths enables us to assess camp organization, occupation intensity, and site formation processes. This research offers the first zooarchaeological evidence for understanding camp organization during the southern Levantine EUP.

Keywords: *Upper Paleolithic, Southern Levant, Zooarchaeology, Contextual Taphonomy, Spatial Analysis*

Variability in Early Neolithic Human-Animal Interactions: A Preliminary View from Balıklı, Central Anatolia

26th May

11:30 - 11:50

ID: 109

*Natalie D. Munro[1], Mary C. Stiner[2], Güneş Duru[3]

1: Department of Anthropology, University of Connecticut, Storrs, CT, USA

2: Department of Anthropology, University of Arizona, Tucson, AZ, USA

3: Department of Archaeology, Mimar Sinan Fine Arts University, Istanbul, Türkiye

*Presenting author (natalie.munro@uconn.edu)

This paper explores variability in human-animal interactions at the time when agricultural societies were first emerging in Southwest Asia by presenting preliminary zooarchaeological data from Early Neolithic Balıklı in Central Anatolia. This well-preserved site is located only 15 km from the contemporaneous, well documented site of Aşıklı Höyük. Nevertheless, the two sites are very different—Aşıklı is a substantial mound formed over 1000-years of occupation that encapsulates a clear pathway to animal management and plant cultivation accompanied by community reorganization, whereas the initial research at Balıklı presented here, suggests that it was a smaller, shorter-lived, and primarily foraging community with less investment in place. This study provides relative taxonomic abundance, mortality and body-part representation data from the first few excavations seasons at Balikli and comparisons with contemporaneous data from Level 4 and 5 at Aşıklı to consider whether common taxa were hunted or herded, to identify differences in human-animal relationships between neighboring sites as well as local variability in early Neolithic communities. Our ultimate goal is to understand why one site was abandoned while the other developed agriculture and the implications of this variability for multiregional models of agriculture.

Keywords: *Sheep, Goat, Central Anatolia, Hunting, Foraging, Domestication, Animal Management*

Avian Exploitation and Habitat Use in the PPNA: Insights from el-Hemmeh, Wadi Hasa, Jordan

26th May

11:50 - 12:10

ID: 139

*Linda Amos, Cheryl Makarewicz

Institute for Prehistoric and Protohistoric Archaeology, University of Kiel, Kiel, Germany

*Presenting author (lamos@ufg.uni-kiel.de)

The Pre-Pottery Neolithic A (PPNA; 10,000–8,500 BCE) represents a significant transition in human history, as mobile hunter-gatherer communities began to adopt more sedentary lifestyles. During this period, there was early experimentation with plant management and an intensified exploitation of local animal resources, including birds.

The early Holocene environment of Wadi Hasa in Jordan featured a diverse mosaic of habitats, including wetlands, steppe grasslands, and rocky uplands, each offering distinct ecological resources. The well-preserved avian assemblage at the PPNA site of el-Hemmeh in Wadi Hasa provides a valuable opportunity to investigate how early sedentary populations interacted with these varied environments.

This study examines the taxonomic composition and diversity of the avian assemblage at el-Hemmeh. By incorporating modern ecological data, we reconstruct the range of environments utilised for bird hunting and assess whether the PPNA population adopted a broad-spectrum strategy or focused on select habitats within their catchment area. Our analysis also investigates how seasonal fluctuations in bird availability influenced hunting strategies, with particular attention to migratory species, which may indicate targeted hunting during specific times of the year.

Additionally, a taphonomic examination of butchery marks and thermal modifications helps determine whether birds were hunted solely for subsistence or also used in symbolic or ritual practices. By integrating taxonomic, taphonomic, and modern ecological data, this research sheds light on how the people of el-Hemmeh interacted with their environment and the role birds played in both their economy and symbolic practices.

Keywords: *Birds, Environment, Exploitation*

Squamate Reptiles and Faunal Intensification in the PPNA at el-Hemmeh, Southern Levant

26th May

12:10 - 12:30

ID: 111

*Maayan Lev, Cheryl Makarewicz

Institute for Prehistoric and Protohistoric Archaeology, University of Kiel, Kiel, Germany

*Presenting author (mlev@ufg.uni-kiel.de)

The Pleistocene-Holocene transition in the southern Levant represents a transformative period in human history, characterized by resource intensification and the gradual shift toward food production. During the Pre-Pottery Neolithic A (PPNA; ca. 12,000–10,300 cal. BP), initial experimentation with plant cultivation was accompanied by hunting and collection of diverse wild fauna—including ungulates, leporids, small carnivores, birds, and reptiles.

Despite their abundance in Pre-Pottery Neolithic sites, squamate remains are often overlooked in zooarchaeological analyses as potential food resources. This study explores the role of squamates in the subsistence strategies of early settled communities, particularly in the semi-arid Irano-Turanian region. Squamates represent an important component of the economy, reflecting the expansion of dietary breadth to include small-game and the intensification of local resource extraction.

This research focuses on el-Hemmeh, a substantial PPNA site in Wadi el-Hasa, where the large whip snake (*Dolichophis jugularis*) and medium-sized lizards (e.g., *Chamaeleo chamaeleo* and agamas) form a significant component of the faunal assemblage. The study of squamates taphonomy and taxonomy helps us determine how squamate remains accumulated at the site and the extent of human exploitation. The dominance of large-bodied non-poisonous species at the site coupled with evidence of human processing and the rarity of digestion marks suggest the intentional collection of this fauna to expend the resources of a growing sedentary community.

Additionally, the robust nature of squamate remains and their good preservation at the site, enables us to detect, through taphonomic analysis, post-depositional processes at the site, such as secondary burning, faunal accumulation rates, and site formation dynamics. These findings contribute to reconstructing the environmental and habitation characteristics of el-Hemmeh during the PPNA.

Keywords: *Squamate Reptiles, Faunal Intensification, PPNA, Taphonomy*

Mass-kill Gazelle Hunting in the Badia: Evidence from Desert Kites and Settlements in the Jafr Basin (Jordan)

26th May

12:30 - 12:50

ID: 146

*Cheryl A. Makarewicz

University of Kiel, Kiel, Germany

*Presenting author (c.makarewicz@ufg.uni-kiel.de)

Recent survey conducted in the eastern edges of the Jafr Basin have identified a chain of desert kites and settlements situated along the Jebel Khashabiyeh dated to the Neolithic. Excavations of both have uncovered rich, well-dated faunal assemblages, offering a unique opportunity to more fully explore gazelle exploitation strategies in the desert margins. Here, demographic, skeletal element distribution, and taphonomic analyses reveal new insights into the seasonality and intensity of gazelle hunting, while stable isotope analyses of teeth inform on gazelle movement patterns. Altogether, these data have important implications for understanding hunter-gatherer adaptations in the challenging environments in the Badia and the spread of caprine herding.

Keywords: *Gazelle, Hunting, Herbivore Migration, Neolithic, Pastoralism*

Tracing the Domestication Process in Southern Zagros, Iran: Insights from Tepe Rahmat Abad

26th May

13:50 - 14:10

ID: 126

*Roya Khazaeli[1,2], Hossein Davoudi[2], Mohammad Hossein Azizi Kharanaghi[3], Marjan Mashkour[2,4]

1: Department of Archaeology, University of Tehran, Tehran, Iran

2: Bioarchaeology Laboratory, Central Laboratory, University of Tehran, Tehran, Iran

3: Iranian Center for Archaeological Research (ICAR), Institute of Cultural Heritage and Tourism, Tehran, Iran

4: Unité Archéozoologie, Archéobotanique (AASPE), Archéozoologie et Archéobotanique: Sociétés, Pratiques et Environnements UMR 7209 du Centre national de la recherche scientifique (CNRS) et Muséum national d'Histoire naturelle (MNHN), Paris, France

*Presenting author (Roya.khazaeli@gmail.com)

Since the 1960s, archaeological studies have identified the Zagros Mountains as a crucial area for the domestication of Caprinae and cereals. Research indicates that Neolithic communities spread from the central Zagros to the southern and eastern areas. Recent findings in Fars province shed light on the introduction of managed goats in the southern Zagros region, while this evidence is insufficient for sheep and cattle species and requires further research and investigation. In this regard, this study focuses on the domestication of sheep and the Neolithic way of life at Tepe Rahmat Abad in Fars Province, excavated over two seasons in 2011 and 2012, revealing artifacts from the Pre-Pottery and Pottery Neolithic periods (mid-8th to late 7th millennium BCE).

The results indicate that domestic goats (*Capra hircus*) served as the main subsistence species throughout the Neolithic period, while wild goats continued to be hunted. Evidence suggests an increase of sheep during the early pottery Neolithic (ca. 7000-6500 BCE). Combined comparative analyses on the representation of sheep and their measurements in other Neolithic sites points at the early stages of their domestication in this area from the mid 8th mill. BCE. As for the cattle (*Bos* sp.) it is even less represented than sheep and at this point it is difficult to address its status of wild or domestic. Hunting activities remained a significant food source, particularly in the Early Pottery Neolithic, with species such as red deer, gazelle, and boar being targeted. These findings highlight the importance of Tepe Rahmat Abad in elucidating the processes of sheep domestication in southern Zagros and contribute to the broader understanding of subsistence strategies and the evolving dynamics between pastoralism and hunting in Neolithic societies over a continuous occupation period of 1,500 years.

Keywords: *Animal husbandry, Neolithic, Southern Zagros, Domestic Sheep*

Animal Bone Remains from 2018-2023 Seasons at Charmo (Jarmo), Iraq

26th May

14:10 - 14:30

ID: 130

*Hitomi Hongo[1], Marjan Mashkour[2], Akira Tsuneki[3], Saber Ahmed Saber[4]

1: Research Center for Integrative Evolutionary Study, Graduate University for Advanced Studies, Hayama, Japan

2: BioArch- UMR7209, Muséum national d'Histoire naturelle, CNRS, Paris, France

3: Institute of Humanities and Social Sciences, University of Tsukuba, Japan

4:Sulaymaniyah Directorate of Antiquities and Heritage, Kurdistan Regional Government, Iraq

*Presenting author (hongouhm@soken.ac.jp)

We present the results of zooarchaeological analyses of faunal remains from 2018, 2019, 2022 and 2023 field seasons at Charmo, conducted by a team from University of Tsukuba (Japan). The material came from both Prepottery and Pottery Neolithic levels of the site. Sheep and goats were dominant in the assemblage and small number of cattle bones were also included, but pigs were rare. Wild animal bones, gazelle, deer, fox and hare were also identified, but much less in number than caprine bones. The relative frequency of these taxa did not change between PPN and PN. Judging from the size, the majority of caprine bones from both PPN and PN contexts come from domestic variety. The size of caprines bones were measured and compared to those from previous studies by Stampfli. The size of *Bos* remains, although small in number, was examined in light of the previous study by Arbuckle et al (2016) that has suggested that domestic cattle arrived rather late in the 6th millennium BC.

Keywords: *Charmo (Jarmo), Zagros Foothills, Fauna, Caprines, Neolithic*

Shaping the Herd: Early Evidence of Caprine Management at Tell Halula

26th May

14:30 - 14:50

ID: 147

*Roger Alcàntara Fors, Carlos Tornero Dacasa, Maria Saña Seguí

Universitat Autònoma de Barcelona, Barcelona, Spain

*Presenting author (roger.alcantara.fors@gmail.com)

Tell Halula, with its extensive 2,000-year occupation sequence from the Middle Pre-Pottery Neolithic B (~8100 cal BC), provides a critical context for understanding the early development of goat husbandry. Previous investigations combining bone biomechanics and sequential stable isotope analyses ($\delta^{18}O$) of tooth enamel have revealed significant human influence on the mobility, feeding, and reproductive cycles of early domestic goats. Progressive reductions in cortical bone mass and alterations in birth seasonality highlight intensifying management strategies over time, suggesting deliberate modifications to natural caprine behaviours.

Building upon these findings, further sequential analyses of carbon ($\delta^{13}C$) and oxygen ($\delta^{18}O$) isotopes are being incorporated to refine our understanding of feeding practices and seasonal herd management. These new data will allow for a more detailed reconstruction of how early agricultural communities at Tell Halula controlled reproductive cycles and adjusted feeding regimes, providing deeper insights into the mechanisms that drove the domestication process.

This integrated approach underscores the dynamic relationship between human societies and caprines, shifting the focus from morphological changes in the animals to the specific management practices employed. The evolving patterns at Tell Halula reflect a complex interplay of environmental adaptation and human intervention, offering a nuanced perspective on the origins of goat domestication in the region.

Keywords:*Tell Halula, Goat Domestication, Stable Isotope Analysis, Neolithic, Herd Management*

Wild or Domestic? Investigating Early Cattle Management at Neolithic Bouqras

26th May

14:50 - 15:10

ID: 107

*Ayşe Ataş Hooglugt

Istanbul University, Istanbul, Türkiye

*Presenting author (r.ayse.atas@gmail.com)

The transition from hunting to animal husbandry represents one of the most transformative shifts in human history. Bouqras, a Neolithic site in modern-day Syria, offers a rare opportunity to explore this process during the Pre-Pottery Neolithic B (7200–6500 BCE). As one of the few well-preserved settlements from this period, its faunal remains provide invaluable insights into early cattle management practices in Southwest Asia.

This study employs zooarchaeological methods to reconstruct husbandry practices at Bouqras. By analyzing age-at-death profiles and biometric data, I aim to identify emerging patterns of selective management and control over cattle reproduction and culling. Preliminary findings suggest that the community at Bouqras began to actively shape cattle populations through these strategies, representing a critical step toward domestication.

This research not only sheds light on the beginnings of cattle domestication but also explores its broader socio-economic implications for Neolithic communities. By presenting these findings at ASWA 2025, I aim to advance discussions on early animal management strategies and their socio-economic implications, offering new insights into human-animal dynamics in the Neolithic.

Keywords: *Animal management, Cattle, Neolithic, Bouqras, Southwest Asia*

Rethinking Human-Cattle Interactions at Neolithic Çatalhöyük

26th May

15:40 - 16:00

ID: 143

*Jesse Wolfhagen[1], Katheryn Twiss[2], Jacqui Mulville[3], Nerissa Russell[4], Louise Martin[5], G. Arzu Demirergi[2], David C. Orton[6], Kamilla Pawlowska[7], Arkadiusz Marciniak[7], Amy Bogaard[8], Jessica Pearson[9], E. Troy Rasbury[2], Elizabeth Henton[5]

1: Harvard University, Cambridge, MA, USA

2: Stony Brook University, Stoney Brook, NY, USA

3: Cardiff University, Cardiff, UK

4: Cornell University, Ithaca, NY, USA

5: University College London, London, UK

6: University of York, York, UK

7: Adam Mickiewicz University, Poznań, Poland

8: Oxford University, Oxford, UK

9: University of Liverpool, Liverpool, UK

*Presenting author (jwolfhagen@fas.harvard.edu)

The wild or domesticated status of cattle (wild aurochsen: *Bos primigenius* or domesticated cattle: *Bos taurus*) at Neolithic Çatalhöyük (Konya, Türkiye) has been of keen zooarchaeological interest since Dexter Perkins' initial report in the 1960s. While earlier research focused on labeling sub-assemblages as wild or domestic, we examine the full sequence holistically to describe how human-cattle dynamics at Çatalhöyük changed over the course of the site's occupation. Using updated biometric and isotopic analyses, we argue that human-cattle interactions at Çatalhöyük can be described by local processes rather than the introduction of new populations. Biometric analyses show gradual size reduction over the site's occupation rather than a step change between two stable morphotypes. Isotopic analyses show that aurochsen lived in diverse habitats around Çatalhöyük. Strontium isotopic ratios do show that the spatial context of human-cattle interactions change drastically mid-sequence, potentially intensifying the processes that reduced cattle body size. We explain these patterns at Çatalhöyük through cattle's ecological role, rather than wild/domesticated identity. As cultivated land expanded with human population size, new ecological opportunities (e.g., crop raiding) became available to local populations. As human populations started to decline in the later phases, this engendered a realignment of the spatial and ecological context of human-cattle interactions, focusing on the Konya Plain (and likely on field margins). We can then interpret cattle biometric trends at Çatalhöyük in the context of long-term exploitation focused on local populations: size reduction was a consequence of selection for faster reproduction in response to increased predation risk. Similarly, increasing proportions of juveniles and stronger female-dominated adult sex ratios can relate to cattle ethology. While Çatalhöyük has recently been considered a "hold out" on the adoption of domesticated cattle, these patterns may instead reflect more common local processes that are difficult to observe in sparser datasets.

Keywords: *Domestication, Biometry, Isotopes, Bayesian Statistics, Niche Construction*

Genomic Evidence for the Widespread Presence of Dogs During the Palaeolithic in Anatolia and Europe

26th May

16:00 - 16:20

ID: 150

*Laurent Frantz[1], William Marsh[2], Lachlan Scarsbrook[1], Douglas Baird[3], Marjan Mashkour[4], Louise Martin[5], Joris Peters[1,6], Olaf Thalmann[1], Greger Larson[7], Ian Barnes[8]

1: Ludwig Maximilian University, Munich, Germany

2: National History Museum London, London, UK

3: University of Liverpool, Liverpool, UK

4: Muséum national d'Histoire naturelle, Paris, France

5: University College London, London, UK

6: Staatliche Naturwissenschaftliche Sammlungen Bayerns - Staatssammlung für Paläoanatomie München, Munich, Germany

7: University of Oxford, Oxford, UK

8: Queen Mary University of London, London, UK

*Presenting author (laurent.frantz@lmu.de)

While the temporal and geographic origins of dog domestication remain unknown, genomic evidence suggests that dogs accompanied the first wave of peopling of the Americas. This indicates domestic dogs originated sometime during the Palaeolithic, over 20,000 years ago. The earliest unequivocal evidence for dogs, based on DNA evidence, however is only ~11,000 years calibrated before present. Although numerous potential canid remains from the Palaeolithic have been provisionally classified as dogs, these specimens remain contentious in the absence of corroborative DNA analyses. To address the presence of dogs during the Palaeolithic, we directly-dated and sequenced low-coverage nuclear and mitochondrial genomes from potential Palaeolithic dog remains from Gough's Cave (UK), Pınarbaşı (Turkey), Wezmeh Cave (Iran), and Grotta Continenza (Italy). Nuclear and mitochondrial DNA analyses demonstrate that these specimens exhibit greater genetic affinity to dogs than to wolves, providing the first direct evidence for the widespread presence of dogs associated with Palaeolithic hunter-gatherer populations across Magdalenian, Epigravettian, and Anatolian contexts in Western Eurasia by at least 16,000 years before present. Notably, the Gough's Cave (UK) and Pınarbaşı (Turkey) dogs displayed a high degree of genetic similarity, despite their association with distinct archaeological cultures (Magdalenian and Anatolian hunter-gatherer). This finding indicates a rapid dispersal of dogs across the region shortly before 16,000 years before present, and further suggests potential interactions between these communities without detectable genomic signatures of gene flow.

Keywords: *Dog, Domestication, Palaeolithic, Anatolia*

Describing Early Domestic Genetic Diversity Using Ancient Sheep Genomes from Anatolia

26th May

16:20 - 16:40

ID: 149

*Pedro Morell Miranda[1,4], Edson Sandoval-Castellanos[2], Sheila Geiger[2], Stefan Krebs[3], Laurent Frantz[4], Joris Peters[2,5], Ivica Medugorac[2]

1: Population Genetics Group, Ludwig-Maximillian University of Munich, Munich, Germany

2: Palaeoanatomy Group, Ludwig-Maximillian University of Munich, Munich, Germany

3: Gene Center, Laboratory for Functional Genome Analysis,

Ludwig-Maximillian University of Munich, Munich, Germany

4: Paleogenetics Group, Ludwig-Maximillian University of Munich, Munich, Germany

5: Bavarian State Collection for Palaeoanatomy, Munich, Germany

*Presenting author (pmorellmi@gmail.com)

Sheep was amongst the earliest livestock species to be domesticated in the Fertile Crescent around 11.000-10.000 years ago. However, the precise geographic location and the number of founder subspecies of the wild ancestor, the Asiatic mouflon, remain contentious. Recent genomic studies suggested that the domestic form emerged either from several subspecies of mouflon or by a well-stratified mouflon population. However, the ancestral phylogeography of mouflon is still unknown, reflected by conflicting patterns of genetic and geographic divergence in mouflon subspecies of Anatolia and Cyprus.

To disentangle the history of early domestic sheep, we sequenced 43 high quality ancient genomes from various Pre-Pottery Neolithic (PPN) sites in southwest Asia, including Göbekli Tepe, an early megalithic site in Anatolia built by a community of foragers, and Aşıklı Höyük, a site reflecting the earliest stages of sheep management and domestication, with implications for sheep husbandry in western Anatolia and Europe. The pooling of these ancient genomes along publicly available (modern and ancient) genomes[1,2] enables us to elucidate the genetic structure of pre-domestic and early domestic sheep populations in Neolithic southwest Asia. Besides showing a loss of diversity in the wild population, our results also hint at translocations of flocks and replacement by Eastern mouflon ancestry to form the modern Anatolian and Cyprian mouflon populations. We interpret these movements as the consequence of the Early Holocene process of deglaciation allowing colonization of new landscapes, but also acknowledge anthropogenic factors in the form of animal translocations, habitat deterioration, and domestic-mediated competitive exclusion of the wild form.

Keywords: *Anatolia, Sheep, Domestication, Genetic Diversity*

The Domestication Of Wild Cattle: a Paleogenomics Perspective

26th May

16:40 - 17:00

ID: 113

*Thierry Grange, Eva-Maria Geigl

Institut Jacques Monod, CNRS, University Paris Cite, Paris, France

*Presenting author (thierry.grange@ijm.fr)

The aurochs occupied a prominent and long-standing place in the imaginary of hunter-gatherers, as seen in cave and wall paintings as well as sculptures from the Paleolithic to the Neolithic. It was a dangerous hunting target that led to its particular role in Paleolithic and early Neolithic societies. It was gradually domesticated during the early Neolithic in South West Asia, leading to a diversification of the resources it contributed to humans. The Neolithic migrations into Europe reconfigured the population structure of both humans and the species they domesticated. We have reconstituted the population dynamics of aurochs and domesticated cattle around the Mediterranean over the last 50,000 years using paleogenomics analyses of hundreds of archaeological bones. We identified the impact of environmental and climatic fluctuations on wild populations revealing their dynamics at the onset of domestication but also blurring the genetic consequences of this domestication. We will discuss our results as well as the impact of the gene flow between the wild and early domesticate populations, which seems to have been a prominent evolutionary driver during the Neolithic.

Keywords: *Cattle, Domestication, Palaeogenomics*

New Insights into the Domestication Process of the Cat through the Analysis of Ancient Genomes

26th May

17:00 - 17:20

ID: 112

Jeanne Mattei, Thierry Grange, *Eva-Maria Geigl

Institut Jacques Monod, CNRS, University Paris Cite, Paris, France

*Presenting author (eva-maria.geigl@ijm.fr)

(In collaboration with many archaeozoological colleagues who will be mentioned in the presentation)

The domestication process and the spread of the domestic cat have been approached by various scientific fields including history, archaeozoology and genetics, but many questions remain. This is partly due to the archaeological record. Indeed, the cat not being a regular subsistence species, the abundance of its remains in prehistoric archaeological sites is low. Moreover, the distinction between post-cranial bones of European wildcats, Near Eastern-North African wildcats and domestic cats is difficult or impossible. The first major paleogenetic study of the spread of the cat since the Neolithic was limited to the analysis of the maternal lineages, which only tell part of the story. A subsequent study of genomes concluded that hybridization between wild and domestic cats was very limited for most of the Holocene, but this study was limited in geographical and temporal extent as well as genomic coverage and therefore did not reveal the essentials of the domestication process.

We undertook a large genomic study of ancient cats covering the entire Holocene and a large geographic region from the southern shores of the Mediterranean Sea to the North Atlantic. Our results complete and partially contradict previous studies. They allow us to establish hypotheses accounting for the complexity of the domestication process of the cat.

Keywords: *Cat, Domestication, Palaeogenomics*

TUESDAY

27th May 2025

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Human-Animal Dynamics in Neolithic Anatolia: A Zooarchaeological Study of Suluin Cave in the Lakes District

27th May

09:30 - 09:50

ID: 135

*Özlem Sarıtaş

Hitit Universitesi, Fen-Edebiyat Fakültesi, Arkeoloji Bölümü, Ulukavak, Çorum, Türkiye

*Presenting author (ozlemsaritas@gmail.com)

Suluin Cave, located in southwestern Anatolia, is a significant Late Neolithic site that was occupied briefly between 6000 and 5800 cal BCE. The cave has produced a rich collection of animal remains, offering valuable insights into the subsistence strategies, animal exploitation, and environmental adaptations of Neolithic communities.

This study presents a comprehensive zooarchaeological analysis of the faunal remains from Suluin Cave, focusing on species composition, taphonomic processes, and subsistence strategies. The remains indicate a mixed subsistence economy that incorporates both wild and domesticated species. Preliminary analysis suggests a combination of hunting and early pastoralism, highlighting a transitional lifestyle between foraging and food production.

By comparing Suluin Cave's findings with those from Neolithic sites in the Lakes Region of southwestern Anatolia, this research examines shifts in faunal exploitation patterns between foraging and early farming communities. Synthesizing the zooarchaeological data from Suluin Cave with evidence from the Lakes Region contributes to a broader understanding of early Anatolian economies and cultural practices. Overall, this study enhances our knowledge of Neolithic lifestyles, the regional variability in animal exploitation, and the adaptive strategies of early communities in southwestern Anatolia. The findings provide new perspectives on the role of animal resources in shaping human societies during the Neolithic period.

Keywords: *Zooarchaeology, Neolithic Anatolia, Suluin Cave, Subsistence Strategies, Animal Exploitation*

Hunting in Neolithic and Chalcolithic Cappadocia: Evidence from Tepecik

27th May

09:50 - 10:10

ID: 102

*Pamela Crabtree[1], Douglas V. Campana[2]

1: New York University, New York, USA

2: Retired

*Presenting author (pc4@nyu.edu)

Tepecik is a Ceramic Neolithic and Chalcolithic site located in Cappadocia, Turkiye. We joined the Tepecik excavation team in 2014, and the focus of our research was on the Early Chalcolithic faunal remains and the worked bone objects from this site. Our research showed that while the economic basis of Early Cahlcolithic Tepecik was caprine husbandry, the faunal assemblage also inclided a diverse rangle of small and large game, ranging from hares to red and roe deer, wild cattle, and equids (see our chapter in *Hunting in the Neolithic)*. For the past two seasons, we have focused on the identification and analysis of the faunal remains from Ceramic Neolithic contexts at the site. Although the majority of the identified bones are caprines, the Neolithic assemblage also includes a wide range of huinted resources. This presentation will compare the evidence for large and small game hunting from Neollithic and Early Chalcolithic Tepecik.

Keywords: *Neolithic, Chalcolithic, Hunting, Cappadocia, Zooarchaeology*

Exploring Land Use and Mobility Using Multi-Isotope Analyses of Faunal Remains from Gird-i Begum (Iraqi Kurdistan)

27th May
10:10 - 10:30
ID: 101

*Jana Eger[1], Corina Knipper[1], Reinhard Bernbeck[2], Susan Pollock[2]

1: Curt-Engelhorn-Centre for Archaeometry, Mannheim, Germany

2: Institute of Near Eastern Archaeology, Berlin, Free University of Berlin

*Presenting author (jana.eger@ceza.de)

Since 2022, renewed excavations have been conducted at the site of Gird-i Begum, located in the southeastern part of the Shahrizor Plain (Iraqi Kurdistan). The principal occupations of the site were in the Late Neolithic/Halaf and Chalcolithic (Ubaid and Late Chalcolithic) periods, that is from the late 6th through the mid-4th mill. BCE, with evidence of later use in the Early Bronze Age. During fieldwork, faunal remains were recovered, though bone preservation is generally poor and sample sizes are small. Terrestrial invertebrates of the variant *Helix Salomonica* are dominant within the collected data, similar to a number of Neolithic sites in the Zagros where mollusks were a frequent component of the archaeological material. Aside from land snails, a range of mammal species were identified, with caprines being the dominant mammals in the assemblage. This study focuses on 15 caprine individuals and five cattle individuals as well as one modern sheep investigating oxygen and carbon isotope compositions through sequentially sampled tooth enamel. We further determine strontium isotope ratios of the same animals to examine mobility or non-local origins. We are interested in the question of how people in the past organized animal husbandry, for example, by practicing seasonal transhumance or focusing on landscape microvariability taking advantage of ecologically different grazing locations. Our aim is to find out to what extent forms of subsistence practices, herding activities and zootechnical knowledge played a role in coping with potential challenges of maintaining and taking care of a herd. The study also aims to contextualize the results by comparing them with available isotopic data from sites in the region of the Zagros mountains. To characterize local biologically available strontium, additional samples are used from pig and deer teeth as well as land snail and freshwater mussel shells of the Begum faunal assemblage.

Keywords: *Western Zagros Foothills, Chalcolithic, Animal Husbandry Practices, Multi-Isotope, Tooth Enamel*

Exploring Chalcolithic Lifeways through Zooarchaeology: Insights from the Yeghegis-1 Rock Shelter, Southern Armenia

27th May

10:30 - 10:50

ID: 103

*Satenik Mkrtchyan[1,2], Gayane Nazaryan[1], Noel Amano[2], Mariam Saribekyan[3], Karen Azatyan[4], Levon Yepiskoposyan[1], Mariya Antonosyan[2]

1: Institute of Molecular Biology, National Academy of Sciences, Yerevan, Armenia

2: Max Planck Institute of Geoanthropology, Jena Germany;

3: Institute of Archaeology and Ethnography, National Academy of Sciences, Yerevan, Armenia;

4: Yeghegnadzor Regional Museum, Yeghegnadzor, Armenia

*Presenting author (satenik.mkrtchyan1@edu.isec.am)

The Chalcolithic period in the South Caucasus, dating from 5,500 to 3,500 BCE, is recognized as a time of increasing social stratification and interconnectivity. Although the archaeological evidence from this era is sparse and concentrated at a few key sites, it suggests that communities were highly dynamic and mobile, with animal herding - particularly of goats and sheep - playing a central role in their livelihoods.

To expand our understanding of the subsistence economy of Chalcolithic herders, we examine faunal material recovered from the Yeghegis-1 rock shelter, located in southern Armenia. The site was occupied between the 5th and 4th millennia BCE, offering valuable new insights into Chalcolithic lifestyles in the region.

Here, we explore human subsistence strategies by conducting detailed analyses of the recovered faunal remains, focusing on morphological and collagen fingerprinting-based identifications. The research also examines the taphonomic processes that influenced the assemblage, as well as the age-at-death profiles and culling patterns of the animals.

The findings reveal that site occupants primarily relied on herding sheep and goats, with minimal evidence of cattle and wild game, highlighting the central role of Caprines in their subsistence practices. Furthermore, the culling of Caprines across all age groups indicates their use for both primary and secondary products, underscoring their economic importance.

Keywords:*Zooarchaeology, ZooMS, Late Chalcolithic, South Caucasus*

From Neolithic Village to Bronze Age Town: Human-Animal Interactions at Ein Zippori, Lower Galilee, Israel

27th May

11:20 - 11:40

ID: 138

*Hagar Reshef, Guy Bar-Oz, Nimrod Marom

University of Haifa, Haifa, Israel

*Presenting author (hagareshef@gmail.com)

The transition from the Chalcolithic to the Early Bronze Age in the southern Levant was a period marked by profound shifts in settlement patterns, social organization, and economic structures. The site of Ein Zippori in the Lower Galilee, Southern Levant, presents a unique case study for examining these changes, with a stratified occupational sequence spanning from the Neolithic to the proto-urban Early Bronze Age.

This study investigates the evolution of animal management systems through analysis of the faunal assemblage from Ein Zippori. Despite significant social transformations—such as the emergence of walled settlements and increasing economic complexity—faunal analysis from the Early Chalcolithic (5th millennium BCE) and Early Bronze Age (late 4th millennium BCE) occupations reveals surprising continuity. Taxonomic composition, mortality profiles, osteometric data, and taphonomic indicators all suggest a stable animal economy with no major shifts in herd management strategies.

The Ein Zippori findings challenge conventional assumptions that economic practices evolved in direct correlation with societal change. Instead, they suggest that despite shifts in settlement organization and material culture, fundamental aspects of animal exploitation remained remarkably stable. This long-term economic equilibrium may reflect successful adaptive strategies suited to Ein Zippori's environment and cultural framework.

By reconsidering the relationship between economic and social transformations, the research contributes to broader discussions on resilience and stability in ancient economies. The findings at Ein Zippori encourage further comparative studies across the region to better understand the mechanisms that sustained early complex societies.

Keywords: *Ein Zippori, Zooarchaeology, Chalcolithic–Early Bronze Age Transition, Animal Economy*

Surviving at the edge of the Lut desert: Archeozoological analysis of the Kale Kub, a possible Uruk outpost in Eastern Iran

27th May

11:40 - 12:00

ID: 142

*Sarieh Amiri[1], Homa Fathi[1], Mohammad Hossein Azizi Kharanaghi[2], Masashi Abe[3], Hossein Davoudi[1], Marjan Mashkour[1,4]

1: Bioarchaeology Laboratory, Central Laboratory, University of Tehran, Tehran, Iran

2: Assistant Professor of Iranian Center for Archaeological Research (ICAR), Institute of Cultural Heritage and Tourism, Tehran, Iran

3: Tokyo National Research Institute for Cultural Features, Tokyo, Japan

4: BioArch-UMR7209, Muséum national d'Histoire naturelle, CNRS, Paris, France

*Presenting author (s.amiri@uga.edu)

The eastern fringes of the Iranian Plateau, particularly the South Khorasan Province, are still very little known archaeologically. Kale Kub, an exceptional site in a hyper-arid environment, was excavated over four seasons, from 2018 to 2023, by M.H. Azizi Kharanaghi and collaborators. The cultural deposits revealed a sequence of occupations from the Early Chalcolithic, 5th Mill. BCE to the Bronze Age, 3rd-2nd Mill. BCE. Notably, there is a 4th Mill. BCE phase contemporaneous to the Susa II horizon /Late Uruk, showing distinctive pottery and indicating cultural interactions between Mesopotamia and Iran. This represents the easternmost evidence of Uruk culture on the Iranian Plateau. The recovery of faunal remains offered an opportunity to investigate the subsistence economies in this exceptional site. The faunal remains are well preserved, and 11554 bone fragments were studied at the Bioarchaeology Laboratory, Central Laboratory of the University of Tehran. The bone deposits from the two first periods are represented evenly, 5675 specimens for Late Uruk, 5101 specimens for the Chalcolithic, and only 778 specimens for the Bronze and Iron Ages. The archaeozoological analysis showed that sheep (*Ovis aries*) and goat (*Capra hircus*) constitute the bulk of the exploited animal resources in all periods (67.5%), where goat outnumbers sheep. Wild herbivores were also hunted by the inhabitants, as indicated by gazelle (*Gazella sp.*) and hemione (*Equus hemionus onager*). Most equid bones from the metric analyses and logarithmic profiles are identified as hemiones, though some may belong to horses or donkeys.

Today Kaleh Kub is in the middle of a very dry and harsh environment. The presence of hemiones and gazelles testifies that the site was already in an arid environment at the time of the occupation of the site. We question here how herding and possibly farming could be maintained in such ecological conditions?

Keywords: *Chalcolithic, Susa II, Late Uruk, Bronze Age, Caprini, East Iran, Arid Zone*

Animals in the Kaska lands: Naturecultures, Social Zooarchaeology, and Faunal Remains from Inönü Cave, NW Türkiye

27th May

12:00 - 12:20

ID: 134

*Benjamin Arbuckle[1], Hamza Ekmen[2], Gülden Ekmen[2]

1: University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

2: Zonguldak-Bülent Ecevit Üniversitesi, Zonguldak, Türkiye

*Presenting author (bsarbu@email.unc.edu)

In this paper, we desscribe new archaeofaunal remains from the Chalcolithic and Late Bronze Age levels of Inönü Cave, NW Türkiye. Results indicate the presence of a rich archaeofaunal assemblage including abundant big game such as roe deer, boar, aurochs, and big cats, as well as ungulate livestock. Wary of the package of assumptions usually associated with post-Neolithic and Hittite period economies in Anatolia, we explore Haraway's idea of Naturecultures as a way to characterize the animal economies at Inönü Cave. This approach allows us to identify difference in the practices and traditions present in the so-called Kaska lands of Pontic Anatolia and also represents an attempt to identify other stories that can be told in regions and temporalities 'peripheral' to the dominant narratives in SW Asian zooarchaeology focused on animal domestication, intensification, and imperial states.

Keywords: *Türkiye, Inönü Cave, Economy, Chalcolithic, Late Brone Age, Epistemology*

Subsistence Economy and Hare Consumption at Kültepe-Kanesh during the Early Bronze Age (EBA III)

27th May

12:20 - 12:40

ID: 148

*Derya Silibolatlaz, İsmail Baykara

Gaziantep University, Gaziantep, Türkiye

*Presenting author (deryasili@gmail.com)

Within scope of this study, aimed to reveal the animal husbandry economies and dietary habits of the inhabitants of Kültepe during the Early Bronze Age (EBAIII), a total of 11,441 animal bones were studied within the zooarchaeological studies. According to faunal remains domestic animals, especially sheep/goats (48.75%), were predominant. Cattle (13.01%) followed sheep/goats. Pig (2.40%) and hare (2.32%) ratios are quite close to each other. There are also wild species within the fauna in small proportions such as red deer (0.01%) and roe deer (0.01%). Equids (0.10%) and donkeys (0.02%). Dog (1.08%), fox (0.02%), bear (0.05%), fish and bird bones are also observed. As a result, it is understood that sheep and goats are play a key role in the livestock economy, as adult animals are slaughtered for wool production. Cattle were generally kept until adulthood and slaughtered at an advanced age, being economically important animals used for plowing fields and pulling loads in agricultural societies. Pigs were slaughtered at a young age and their only product, meat, was utilized, but we also see that rabbits were consumed at least as much as pigs. In order to understand the genus level of the *Leporidae* specimens, PCA analysis were applied. Thus, it may be assumed that hare were hunted by Kültepe's people and brought to site and then consumed the especially meaty parts.

Keywords*: Kültepe-Kanesh, Early Bronze Age III, Animal Economy, Zooarchaeology, Anatolia*

Food offerings in Tomb VII at Mishrifeh Qatna (Bronze Age, Syria)

27th May

13:40 - 14:00

ID: 127

*Emmanuelle Vila

Archéorient UMR 5133-CNRS/University of Lyon 2, Lyon, France

*Presenting author (emmanuelle.vila@mom.fr)

In 2009, Tomb VII was discovered at the Tell Mishrifeh/Qatna site in Syria, located under the northwest wing of the royal palace, during excavations conducted by the German mission from the University of Tübingen. Based on ceramic remains and other artifacts, the tomb has been dated to the Middle Bronze Age IIA and IIB, with its use continuing into the Final Bronze Age.
The entrance area contained an impressive quantity of bone remains, and two burial chambers were uncovered during the excavation campaigns. Among the numerous human bones, animal remains were also found, representing secondary deposits. Unfortunately, these animal remains could not be studied directly due to the onset of war in Syria in 2011, which has restricted access to the materials ever since. However, a unique archaeozoological approach was undertaken thanks to extensive graphic and photographic documentation of the funerary levels during the field excavations and close collaboration with archaeologists and anthropologists. In fact, the analysis of the animal bones was carried out using over 500 photographic documents and drawings.
According to this study, Tomb VII at Qatna provides evidence of complex rituals during the Middle Bronze Age, where the selection of food offerings and the organization of animal sacrifices and butchery were significant aspects of the funerary practices.

Keywords: *Northern Levant, Funerary Contexts, Ritual Practices, Animal Bones*

Feathers in the City: Updating the Bird Assemblage from the Neighborhoods of Ancient Ur, Southern Iraq

27th May

14:00 - 14:20

ID: 120

*Nicholas A. Gonzalez[1], Natalie D. Munro[1], Katheryn C. Twiss[2]

1: Department of Anthropology, University of Connecticut, Storrs, CT, USA

2: Department of Anthropology, Stony Brook University, NY, USA

*Presenting author (nick.gonzalez@uconn.edu)

In ancient Mesopotamia, birds and their products were important economic resources. Their management by breeders, as well as their hunting by fowlers, are depicted in art and administrative clay tablets across the region, particularly during the late 3rd millennium BCE. Nevertheless, few accounts date to the early 2nd millennium BCE, limiting insight into the role birds played in the daily lives of ancient people. The study of faunal remains can fill this lacuna and provide novel insights into the intricacies of taxa diversity and how animals were handled and processed. We present a rare zooarchaeological study on the bird assemblage from households excavated between 2015 and 2019 in Ancient Ur, Southern Iraq. These deposits originate from a number of early 2nd millennium BCE neighborhoods across the city. We explore bird taxonomic representation and use through taphonomic and body-part analyses. We then pair the assemblages with textual records and compare them to the mammalian remains to develop a more comprehensive understanding of southern Mesopotamian diets. Our preliminary results show that people were supplementing their diets with waterbirds, especially ducks, which suggests access to resources from nearby marshlands just outside the city walls on the household level. This leads us to question whether these birds were wild or managed, and when the regional management and eventual domestication of waterbirds began.

Keywords*: Zooarchaeology, Ancient Ur, Mesopotamia, Bird Management*

Meals for the Dead: Evidence of Intermediate Bronze Age Animal Offerings from the Newe Efrayim Cemetery

27th May

14:20 - 14:40

ID: 114

*Midori Intrator, Lee Perry-Gal, Yossi Elisha, Yaniv Agmon, Gilad Itach

Israeli Antiquities Authority, Israel

*Presenting author (miintrator@gmail.com)

The Newe Efrayim cemetery, recently uncovered in the central coastal plains of Israel, represents a monumental discovery in the study of Intermediate Bronze Age mortuary practices. Spanning over a thousand excavated graves, this unparalleled burial site offers a wealth of material for understanding the social and ritual customs of the period. Aside from various grave goods such as ceramic vessels, jewelry and metal objects, approximately a fifth of the graves uniquely feature faunal remains, providing a rare opportunity to investigate their role within funerary contexts.

The faunal remains consistently comprise skeletal elements of ovicaprines (sheep/goat), specifically ribs and limb bones, with a conspicuous absence of skulls, vertebrae, and toes. These elements are predominantly complete and only occasionally found in articulation, suggesting deliberate selection and preparation. This study seeks to explore the significance of these offerings by examining species identification, age profiles of the animals, and potential associations with the age and sex of the deceased, as well as the other grave goods.

Preliminary interpretations suggest that these remains represent intentional food offerings to the dead rather than residual feast debris, providing insights into the symbolic and practical dimensions of Intermediate Bronze Age burial customs. By analyzing these patterns, this research contributes to a deeper understanding of the social structures, ritual practices, and cultural traditions of the region's inhabitants, addressing broader questions about life and death in the southern Levant during this period.

Keywords: *Zooarchaeology, Intermediate Bronze Age, Human Burial, Cemetery, Newe Efrayim*

POSTER SESSION

15:10 - 17:00

The Role of Animal Management and Domestication in 9th millennium BP Motza, Israel

27th May

ID: 106

*Nimrod Katzir[1], Hamoudi Khalaily[2], Jacob Vardi[2], Lidar Sapir-Hen[1]

1: Department of Archaeology and Ancient Near East Cultures, Tel Aviv University, Tel Aviv, Israel

2: Israel Antiquities Authority, Jerusalem, Israel

*Presenting author (nimrodk2@mail.tau.ac.il)

Neolithic 'megasites', large population centers, first appeared in Anatolia, Syria and Transjordan in the 10th millennium BP. It is often assumed that the FPPNB outlines a period of broad societal collapse with evidence pointing at the dissolution and abandonment of all major 'megasites' during the 9th millennium BP. However, the settlement recently unearthed in Motza in the Judean Hills shows a population center that not only strived but expanded into 'megasite' proportions during this period. We studied the faunal remains from Motza Stratum II with the aim to shed light on the subsistence strategies that supported the formation of this unique occupation. We examined the taxonomic abundance, age and sex profiles, skeletal parts representation and size of the main species in the assemblage. Based on the results, we discuss the chronology of animal domestication, as we outline the extent of livestock exploitation at Motza and its societal role. Our research helps better understand the role of animal management in the durability and longevity of Motza, on the backdrop of a regional societal collapse.

Keywords: *Motza, Neolithic Megasites, Domestication, Animal Management*

Seasonal Herding Practice in the Neolithic of Central Anatolia: Stable Isotope Analysis of Caprine Diet and Mobility at the site of Pınarbaşı

27th May

ID: 124

*Chen Wang

University College London, London, UK

*Presenting author (wangchen98425@gmail.com)

The Epipalaeolithic and Neolithic site of Pınarbaşı is located near the center of the Konya Basin in south-central Anatolia, Turkey. With its long-term but non-continuous occupation, the site is important for studying not only the transition from hunter-gatherers to herding and cultivation in Central Anatolia but also the development of caprine pastoralism locally.

The current study focuses on understanding the local development of caprine herding. By the 7th millennium cal BC, Pınarbaşı B shows a dominance of domestic caprines, interpreted as reflecting livestock herders using the rockshelter and surrounding area seasonally for grazing and shelter, likely during birthing months. Whether the herders were highly localized or made longer-distance seasonal movements is as yet unclear. The current project uses zooarchaeological and biomolecular approaches to reveal the dietary habits of the 7th millennium cal BC Pınarbaşı caprine herds and also aims to assess their seasonal mobility patterns.

By conducting stable isotope analysis, such as carbon, nitrogen, oxygen, strontium, and sulphur isotopes, on continuous intra-tooth samples from the second molar of sheep and goats from the 7th millennium BC phase of Pınarbaşı B, we aim to obtain environmental indicators of herding seasons and locations. The isotopic data helps determine whether the Pınarbaşı pastoralists operated independently, moved their flocks seasonally to the distant Taurus Mountains, or maintained close ties with neighboring sites such as contemporary Çatalhöyük East. Additionally, this analysis—when applied in the future to earlier phases of Pınarbaşı—will shed light on how herding practices developed over time.

The caprine utilization strategies at Pınarbaşı likely reflect the economic and social complexities of Neolithic Anatolian communities, offering insights into the shifts in networks, organization, and production in Central Anatolia during prehistoric times.

Keywords: *Caprine, Neolithic, Anatolia, Herding, Isotope*

Neolithic Bone Objects and Tools of Charmo (Jarmo) (Iraq) Investigated Through Paleoproteomics (ZooMS and LC-MS/MS)

27th May

ID: 144

*Marjan Mashkour[1], Fabrice Bray[2], Hitomi Hongo[3], Saber Ahmed Saber[4], Akira Tsuneki[5]

1: BioArch- UMR7209, Muséum national d'Histoire naturelle, CNRS, Paris, France

2: MSAP – UAR3290, CNRS, Université de Lille, Lille, France

3: Graduate University for Advanced Studies, Research Center for Integrative Evolutionary Science, Hayama, Japan

4: Sulaymaniyah Directorate of Antiquities and Heritage, Sulaymaniya, Iraq

5: University of Tsukuba, Tsukuba Japan

*Presenting author (marjan.mashkour@mnhn.fr)

In the framework of the recent archaeozoological investigations in Charmo (Jarmo) excavated by the joint Japanese and Iraqi archaeological mission, a pilot program of paleoproteomic study was carried out on the faunal remains during the 2024 study season in Sulaymaniyah. The medium and large size herbivores identified in this assemblage (see Hongo et al., this ASWA 16th conference) are composed of a majority of sheep, goat, bovines and suids plus cervids and gazelle that were consumed. Apart from consumption, the herded or hunted animals were also exploited as raw material for producing tools. The tools were described and allocate to a species or to a size range taxa. The idea behind using this new approach was to check if all the animals present at the site were used for tool making or not.

For sampling he bone objects exhibited at the Museum of Sulaymaniyah we used adhesive patches to collect 1 mg of bone without damaging the appearance of the object. For less sensitive cases we scratched the cortical bone to collect 1 to 5 mg powder. The samples were analysed at the Laboratory of MSAP in Lille by F. Bray. Identifications were realized by MALDI-FTICR and LC-MS/MS. MALDI-FTICR analysis identified collagen in 60% of the samples. Collagen quality was measured using the percentage of glutamine deamidation in ancient (53.8%) samples. The percentage of deamidation indicates an advanced state of degradation of the protein in this Neolithic site located in an arid zone on the piedmonts of the western Zagros. The identified taxa by ZooMs are bovines, possibly cervids, goat, sheep, suids, gazella. This in line with the general taxonomic identifications done on the basis of the comparative anatomy. With use of the paleoproteomics we are now able to identify the origin of the objects and tools, unknow until now.

Keywords: *Paleoproteomics, Bone tools and objects, Kurdistan Iraq, Neolithic*

Reconstructing Captivity and Freedom: Entheses-Based analysis of activity in Modern and Archaeological Sheep

27th May

ID: 136

*Christina Siali[1], Katerina Harvati[1,2], Nadja Pöllath[3,4] Joris Peters[3,4], Renate Schafberg[5], Fotios Alexandros Karakostis[1,2,6]

1: Palaeoanthropology Department, Senckenberg Centre for Human Evolution and Paleoenvironment, Institute for Archaeological Sciences, Eberhard Karls University of Tübingen, Tübingen, Germany

2: DFG Centre for Advanced Studies 'Words, Bones, Genes, Tools', Eberhard Karls University of Tübingen, Tübingen, Germany

3: ArchaeoBioCenter and Institute of Palaeoanatomy, Domestication Research and the History of Veterinary Medicine, Ludwig Maximilian University Munich, Munich, Germany

4: SNSB, Bavarian State Collection of Anthropology and Palaeoanatomy, Munich, Germany

5: Museum of Livestock Sciences, Central Natural Science Collections, Halle (Saale), Germany

6: Integrative Prehistory and Archaeological Science, University of Basel, Basel, Switzerland

*Presenting author (christina.siali@uni-tuebingen.de)

This study presents the first application of the Validated Entheses-based Reconstruction of Activity (V.E.R.A.) methodology to reconstruct domestication-related activities of sheep in the archaeological record. Using univariate and multivariate statistics, we analysed muscle attachment (entheseal) measurements of the distal humerus in a modern and an archaeological sheep sample. The modern sample included captive Karakul, Marsch and Asiatic mouflon, and free-ranging Urial, Asiatic mouflon, and Soay sheep. Ancient sheep derived from the archaeological sites at Göbeklitepe and Gusir Höyük (hunting contexts) and Gürcütepe and Tall Munbaqa (domestication contexts) in Turkey and Syria. Our findings in modern sheep reveal that morphological variability among different sheep can obscure activity-related muscle recruitment patterns. However, focusing exclusively on captive and free-ranging Asiatic mouflon achieves over 90% accuracy in cross-validated classification. Comparisons between ancient and modern sheep show that their muscle recruitment patterns are not directly comparable. In contrast, analysis restricted to archaeological samples from domestication and hunting contexts achieves classification accuracy of up to 92%. This research showcases the potential of V.E.R.A. to reconstruct domestication-related activities in sheep within archaeological contexts. Finally, it highlights the importance of considering morphological variability across time and space, and differing management practices when reconstructing activity in ancient sheep populations.

Keywords: *Sheep Domestication, Activity Reconstruction, 3D analyses*

The Holocene Brown Bear (Ursus arctos L.) in Morocco: A Study of its Diet by ZooMS and Isotopic Analysis

27th May

ID: 100

*Shaymae Iken[1], Abdeljalil Bouzouggar[2], Aurora Grandal-d'Anglade[2]

1: Institute of Geology, University of A Coruña, A Coruña, Spain

2: National Institute of Archaeological Sciences and Heritage, Rabat, Morocco

*Presenting author (new.life4me@live.fr)

The identification of fossil taxa is the main goal of paleontology. Knowing the composition of communities is fundamental to characterizing past ecosystems and understanding changes in environment and climate. However, taxonomic identification of animal remains is not always straightforward due to the high degree of fragmentation that bones tend to present.
Recently, a technique of molecular biology (proteomics) has been developed for the identification of bone fragments, through the collagen peptide fingerprinting by mass spectrometry (ZooMS). This requires the collagen to be removed from the bones and that this collagen maintains a good degree of preservation. Breaking the collagen molecule between specific amino acids with tripsine, the obtained set of peptides can be identified by MALDI-TOF (Matrix-Assisted Laser desorption/ionization, time of flight). Some of them are characteristic of a certain taxon, and their presence or absence will allow us to differentiate the taxon from which they come, working as true markers.
In this work we applied those techniques to animal bones remains from the cave sites of el Hammar and Hattab II, both located in northern Morocco during End-Pleistocene and Holocene. In those two sites, the bone sample is usually fragmented and therefore taxonomic identification was only possible in a low percentage of the remains. However, the results obtained allowed us to broaden the faunal spectrum and the number of remains identified, including ursids, felines and several ungulates Not only that, but also, we make an Isotopic analysis for our samples to reconstruct the ecology of our species the collagen, and then analyzing the carbon and nitrogen isotopic ratio. In addition to reporting on the type of diet of the organisms, they reflect environmental variables such as the degree of tree cover, temperature, humidity of the environment or the altitude and orographic conditions of the area where they lived.

Keywords: *Hammar cave, Hattab II cave, Bone Collagen, Peptide Fingerprinting, Stable Isotopes*

Tracing Avian Shifts: Insights from Zooarchaeology and Species Distribution Modeling in the Anthropocene

27th May

ID: 121

*Ramazan Parmaksız[1], Beatrice Demarchi[1], Dan Chamberlain[1], Katerina Carlotta Koukzelas[1], Riccardo Alba[1], Lisa Yeomans[2]

1: University of Turin, Turin, Italy

2: University of Copenhagen, Copenhagen, Denmark

*Presenting author (ramazan.parmaksiz@unito.it)

The Anthropocene Epoch, characterized by the transformative impact of human activity on the environment, highlights the critical importance of preserving biodiversity and maintaining ecological balance. A comprehensive understanding of human-animal-environment interactions, informed by insights from the past, is essential for interpreting present trends and anticipating future challenges. Birds, with their extraordinary diversity of over 11,000 species, serve as key indicators for unraveling the dynamic interplay between climate, ecosystems, and human influence over time. Understanding the past distribution of bird species that interacted with humans and analyzing their current distribution hold great potential for shedding light on these interactions.

This study examines zooarchaeological data from 15 archaeological sites spanning the Epipaleolithic to the Late Pre-Pottery Neolithic periods, located in the culturally significant regions of the Konya Plain, the Upper Euphrates-Tigris Basin, and the Levant. Species-level identification of bird remains from published zooarchaeological data, combined with modern avifaunal distribution and breeding records from the European Breeding Bird Atlas Project (EBBA2) and eBird, was used to create a map illustrating possible long-distance shifts of bird species found at the archaeological sites. Subsequently, the MaxEnt Species Distribution Model (SDM) was applied to test these possible long-distance shifts.

The results reveal that while some bird species documented at archaeological sites have shifted their localities by over 200 kilometers since the Younger Dryas and Early Holocene, others might have undergone a long-distance change. These findings underscore the intricate relationships between avifaunal distributions, environmental dynamics, and potential human influences over millennia. By bridging the past and present, this research highlights the value of zooarchaeological data in Anthropocene studies and offers critical insights into biodiversity dynamics, using avian species as key indicators of ongoing environmental changes.

Keywords: *Avifauna, Early Holocene, Neolithic, Zooarchaeology, Anthropocene*

All That Remains: A Zooarchaeological Assessment of Faunal Material from Naame, Lebanon

27th May

ID: 128

*Gabriele Russo[1], Maya Haïdar-Boustani[2], Sireen El Zaatari[1]

1: Paleoanthropology, Senckenberg Centre for Human Evolution and Palaeoenvironment, Eberhard Karls University of Tübingen, Tübingen, Germany

2: Musée de Préhistoire libanaise, Université Saint-Joseph de Beyrouth, Beyrouth, Lebanon

*Presenting author (gabriele.russo@uni-tuebingen.de)

The Levantine Middle Paleolithic holds a key position in the study of human evolution and dispersal, particularly during the period between approximately 130.000 and 70.000 years ago, when fossil evidence suggests alternating occupations and perhaps cohabitation of different human species in this region. Lebanon, located at the heart of the Levant's Mediterranean coast, is rich in Paleolithic archaeological heritage. However, geopolitical challenges since the 1970s have significantly hindered archaeological research, limiting our understanding of past human behavior and ecology in this region.

In this study, we present the first zooarchaeological assessment of the faunal assemblage from the site of Naame, which was excavated in the late 1960s and subsequently destroyed during highway construction in 1975. Through zooarchaeological and taphonomic analyses, we aim to reconstruct hominin subsistence strategies, hunting practices, and landscape use during the Late Pleistocene, based on the material that remains available from this site.

Our results indicate a predominant focus on adult large game, including aurochs, fallow deer, and red deer, with occasional exploitation of smaller ungulates. Taphonomic evidence highlights specialized butchery practices, such as skinning and marrow extraction. Site catchment analysis suggests the use of diverse habitats within a relatively small geographic area. Interestingly, the absence of gazelle remains points to a deliberate avoidance by hominins, potentially influenced by ecological factors that favored other high-ranked prey.

We also compare these findings with data from the southern Levant to examine regional variations in hominin behavior and ecological niche exploitation.

Overall, our findings highlight a flexible subsistence strategy, with hominins adapting their mobility and hunting practices to optimize resource use in response to environmental conditions.

Keywords: *Middle Paleolithic, Lebanon, Subsistence, Ecology, Landscape Use*

Investigating Pastoral Strategies and Mobility of Kura-Araxes Communities in Armenia: a Multi-Method Approach

27th May

ID: 125

*Tim Mibord[1,2], Jwana Chahoud[1,2], Bérengère Perello[1]

1: Archéorient UMR 5133, Lyon, France

2: Université Lumière Lyon 2, Lyon, France

*Presenting author (tim.mibord@gmail.com)

As part of my PhD, this study explores the strategies used by Kura-Araxes (KA) communities (c. 3500-2500 BC, Early Bronze Age) in Armenia to secure supplies based on animal products. The aim is to identify the seasonality of pastoral practices and the associated mobility, which will in turn allow us to define the occupation patterns on the Armenian plateau during the Early Bronze Age.

Three main approaches are favoured. The first is a study of faunal data from six unpublished sites, the results of which are compared with those from older collections. These studies are based on the archaeozoological analysis of faunal assemblages from three different regions, each characterized by distinct ecozones.

Secondly, traditional morphometry and geometric morphometry are combined to characterise the morphotypes exploited. In addition, a geometric morphometry protocol is being implemented to distinguish domestic cattle from European bison, with the aim of better characterising the role of this taxon in the exploitation of wild game.

Finally, isotope analyses will be carried out to answer questions about human and animal mobility. The results of these analyses carried out on livestock teeth will be compared with those carried out on human remains.

Keywords: *Kura-Araxe, Early Bronze Age, South Caucasus, Pastoral Strategies, Mobility*

WEDNESDAY

28th May 2025

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Dama dama as the Source of Raw Materials in the Neolithic in the Eastern Balkans

28th May

09:30 - 09:50

ID: 108

*Selena Vitezović

Institute of Archaeology, Belgrade, Serbia

*Presenting author (s.vitezovic@ai.ac.rs)

Animal skeletal elements were widely used for production of everyday tools and ornaments in the Neolithic period in the eastern Balkan area. Mainly the domestic species were exploited – sheep, goats, cattle, but skeletal elements of cervids were used as well – antlers, long bones and short bones of red deer, roe deer and fallow deer. The frequency of their usage varied between different regions and over time, due to environmental, economic reasons and cultural preferences. The Late Neolithic site of Hauza – Kapitan Andreevo, situated in the present-day Bulgarian-Turkish border, in the immediate vicinity of the town of Kapitan Andreevo, provided the ample evidence for the usage of skeletal elements from fallow deer. At this site, rescue excavations were carried out in 2013-2014, revealing a large number of pits from the Late Neolithic period, with rich and diverse portable findings, including a rich assemblage of osseous artefacts. The assemblage comprised approximately 400 complete and fragmented items and manufacture debris, and provided the information on the exploitation of skeletal elements from different species. Particularly interesting are artefacts produced from skeletal elements of *Dama dama*, that will presented in this paper. Fallow deer tibiae and metapodial bones were widely used, especially for those techno-types usually produced from sheep/goat or roe deer bones at other Neolithic sites in Thrace. Also, antlers were relatively frequently used, mainly for small percussion and cutting tools.

Keywords: *Dama dama, Neolithic, Eastern Balkans, Osseous Artefacts, Bone Industry*

Shared life - in this world and in the afterlife: buried animals from two prestigious tombs of the Third Intermediate Period in Buto, Egypt

28th May

09:50 - 10:10

ID: 145

*Chiori Kitagawa[1, 2]

1: Freie Universität Berlin, Berlin, Germany

2: Kanazawa University, Kanazawa, Japan

*Presenting author (chiorikitagawa@gmail.com)

This paper presents findings on animal remains from two elite burials of the Third Intermediate Period in Buto, situated in the northwestern Delta of Egypt. The tombs (J2/67 and J2/89) were laid out parallel to each other with a distance of three meters between them and each contained a human alongside burial goods including an animal. Excavations carried out by the German Archaeological Institute (DAI Cairo department) in 2008 revealed that tomb J2/67 contained an adult male individual alongside grave goods including fragmented monkey bones placed within the inner coffin, while another adult male individual was buried with a cat positioned in the outer sarcophagus (tomb J2/89). The intentional placement of different animal species within these elite burials, combined with extensive marine shell (mostly *Cerastoderma* sp.) deposits on these sarcophagi, provides unique insights into the complex mortuary practices of Third Intermediate Period Egypt in Buto.

Keywords: *Ancient Egypt, Buto, Animal Aurial, Third Intermediate Period*

The Faunal Remains of Early Iron Age Tell Qasile, Israel – Town and Temple

28th May

10:10 - 10:30

ID: 104

*Elad Ben Yehuda[1,2], Lidar Sapir-Hen[1], Yuval Gadot[1]

1: Tel Aviv University, Tel Aviv, Israel

2: Israel Antiquities Authority, Jerusalem, Israel

*Presenting author (eladbyd@gmail.com)

The presentation will show the results of a study of the faunal remains from early Iron Age Tell Qasile, Israel. Tell Qasile, a site near the estuary of the Yarkon river, was the largest settlement along the Yarkon in Iron Age I and early Iron Age IIA (~12th-10th century BCE). Excavations at the site revealed a town of planned living quarters and a sacred area with a temple. All excavated areas in the site yielded animal remains.The study's goal is to reconstruct the town's animal economy, dietary habits and cult practices. By conducting intra site comparison, we will explore the day-to-day animal consumption, reflecting the animal economy and dietary habits, and the sacrifice and consumption of animals as part of the rituals in the yard of the town's temple. By comparing the results to other south Levantine sites, dated to the same period, we discuss the town's population cultural identity, assuming that both daily consumption habits and ritual practices are influenced by cultural identity and traditions.

Keywords: *Iron Age, Southern Levant, Cult, Cultural Identity, Diet*

Cowries as Social Currency in the Iron Age Levant

28th May

10:30 - 10:50

ID: 119

*Daniella E. Bar-Yosef Mayer

The Steinhardt Museum of Natural History, Tel Aviv University

*Presenting author (baryosef@tauex.tau.ac.il)

For shell to be considered a means of payment, they should fulfill several requirements: They must be portable, durable, divisible and recognizable. Historic and ethnographic evidence support the use of cowries as money in different parts of Asia and Africa. Evidence of the cowrie *Monetaria moneta* as money is found in Bengal from the 3rd–6th centuries CE where they served in small transactions, in parallel to weighted lumps of silver and later silver coins. I propose that the idea of cowries as "small change" that accompanies silver originated in Southwest Asia where *Monetaria annulus* were used. Beginning in Iron Age II, from the 10th-7th centuries BCE, cowries are present in numerous sites, some unmodified. The system seems to have dissolved, and cowries disappear from the archaeological record once coin minting began around 630 BCE. Shell money as a concept may have spread from the Levant Westward to Europe and Eastward to the Indian subcontinent and parts of China.

Keywords: *Shell money, Cowries, Levant, Iron Age*

In the cycle of time and seasons: Wishing for the fertility of the earth and the women

28th May

11:20 - 11:40

ID: 115

*Katerina Trantalidou

Hellenic Ministry of Culture, Greece

*Presenting author (ktrantalidou@yahoo.gr)

On the occasion of the discoveries made during the 2021-2023 excavations at the top of the acropolis of the ancient city of Kythnos, on the homonymous island in the Aegean Sea, we will discuss the offerings of pigs, or rather of piglets, in Greek sanctuaries dedicated to Demeter.
At Kythnos, the sanctuary, which was in use from the end of the 8th century B.C. until the 3rd century A.D., comprised four buildings. Among the votive objects are almost 2,000 archaic-hellenistic terracotta figurines depicting women carrying water or piglets, children, actors, piglets, turtles, lions, rams, birds, etc.
Graffiti on ritual drinking vessels from buildings 3 and 4 bear the names of the venerated deities Demeter and Kore. Demeter was worshipped as Thesmophore. In the Greek world, Thesmophoria (the festival of institutions linked to social life) was the oldest festival of fertility, sowing and fruit-bearing, dating back to the 11th century B.C.

Keywords: *Sanctuary of Demeter, Pigs, Kythnos*

On Goats and Their Hair - Considerations on Husbandry and Economy of Ancient Lycia and Adjacent Regions

28th May

11:40 - 12:00

ID: 140

*Gerhard Forstenpointner[1], Alfred Galik[2]

1: University of Veterinary Medicine, Vienna, Austria

2: Austrian Archaeological Institute, Vienna, Austria

*Prenting author (gerhard.forstenpointner@vetmeduni.ac.at)

Faunal reports from ancient Lycia prove striking predominances in caprine remains as a common and diachronic feature. We present zooarchaeological evidence from archaic to middle-byzantine Limyra and from archaic-classic Xanthos while reference data are available from Lycian Olympos and from several sites in adjacent regions like Cilicia and Pisidia.
Taking into account the problematic feeding nature of goats that contrary to sheep or cattle might cause severe deterioration of landscapes we propose a specific economic reason, able to explain the strong focus on breeding goats. Various literary sources mention a textile called "cilicium", produced of goat hair. Authors describe cilicium as a very strong and almost undestroyable kind of cloth that is mainly used in military and naval context. According to literature, production of the textile took place not only in Clicia but also in Lycia and Phrygia, most likely providing a highly requested article for export.

Keywords: *Zooarchaeology, Lycia, Limyra, Capra, Cilicium*

“Eating Flesh is unprovoked murder”. Long-term faunal consumption in al-Bad‘ Oasis, Saudi Arabia

28th May

12:00 - 12:20

ID: 110

*Hervé Monchot [1], Wim Wouters [2], Guillaume Charloux [3], Samer Sahlah [4], Abdu Elah Al-Tarib [4]

1: Centre de Recherche Jaussen & Savignac, Université Paris 1 Panthéon Sorbonne, Paris, France

2: Royal Belgium institute of Natural Sciences, Brussels, Belgium

3: CNRS/UMR 8167 Orient & Méditerranée, Paris, France

4: Heritage Commission, Saudi Ministry of Culture, Riyadh, Saudi Arabia

*Presenting author (herve.monchot@wanadoo.fr)

Located near the Gulf of Aqaba in the Madyan Peninsula, the al-Bad‘ oasis comprises eight archaeological sites dating from the Neolithic to the early Islamic era, which were the subject of excavated surveys between 2017 and 2022 by a Saudi-French team (CNRS-Heritage Commission). Among the many artefacts found, almost 10,000 faunal remains, including mammals, fish and seashells, have been identified. The archaeozoological study of these different assemblages will enable us to follow the evolution of meat consumption over time. This examination will highlight both the persistence and the notable variations in dietary/culinary practices within the oasis from around 7000 BC to the 9th century CE. Finally, these results will be compared with those obtained from other major urban centres in north-western Arabia.

Keywords: *Archaeozoology, Mammals, Fishes, Seashells, Al-Bad Oasis*

Animal Uses at Medieval Islamic *Zughar* in the Bilad ash-Sham

28th May

13:20 - 13:40

ID: 116

*Louise Martin[1], Marie Middleton[2], Konstantinos D. Politis[3]

1: UCL Institute of Archaeology, London, UK

2: c/o UCL Institute of Archaeology, London, UK

3: Hellenic Society for Near Eastern Studies, Chalkida, Greece

*Presenting author (louise.martin@ucl.ac.uk)

Khirbat ash-Sheik 'Isa (KSI) in modern Jordan's Ghor as-Safi was the important market (*souk*) town known as *Zughar* in Bilad ash-Sham during the Early and Middle Islamic periods (9-10 C AD and 12-14 C AD), based on specialist agricultural production for export (notably indigo in the 9-10 C, and cane sugar in the 12-14 C).

This paper draws on preliminary zooarchaeological investigative results to address three main questions concerning animal use at the site: 1) Does KSI reflect the wider shifts in animal production seen in rural settlements in southern Jordan between earlier and later Islamic periods, such as increased specialisation of livestock management aimed at creating market surpluses to feed labouring populations? 2) Does the site show relative autonomy in livestock production, or more likely to be provisioned by herds from further afield for consumption? 3) A further question relates to identifying practices of harnessing animal power, both in agricultural labour (e.g. ploughing, water-lifting) and as pack animals – beasts of burden - in regional transport and trade networks. The role of cattle, camels, horses and donkeys will be assessed in this light.

Recent archaeobotanical observations at KSI find evidence of large ruminant dung in *tabune* oven structures, likely reflecting the use of animal dung cakes used to fuel them, while also allowing the identification of animal foddering. Dung was also often used in the construction of *adobe* brick structures and features. The integration of animal and crop management at KSI will also be discussed.

Keywords: *Medieval, Islamic, Jordan, Livestock, Trade*

Feather Remains from Nahal Omer, an Early Islamic Site in the Negev Desert

28th May

13:40 - 14:00

ID: 118

*Dariya Lokshin

Haifa University, Haifa, Israel

*Presenting author (dlwqsyn@gmail.com)

This study focuses on the analysis of the feather assemblage from the early Islamic (7th–9th centuries CE) archaeological site at Nahal Omer in the Negev desert, Israel. The assemblage consists of 1,943 specimens from 8 wild bird species that were categorized by type, including contour, down, flight, and tail feathers. They represent domestic chickens, ostriches, storks, raptors, and others. Chickens were the most common species (NISP = 1,813), with feathers revealing a variety of colours and patterns. The most common colour was brown, followed by lighter shades like white and caramel. The most frequent pattern was unpatterned, while patterns such as "Barred" were less common. Taphonomic analysis reveals patterns of new and old breakage, changes in feather morphology, and distinct human manipulation of feathers, particularly in chickens, suggesting intentional processing.

The study introduces new methods for analysing the taphonomy of feathers in archaeological sites, emphasizing distinctions between intentional and natural damage, with a focus on the special treatment of domestic bird feathers.

Keywords: *Nahal Omer, Negev, Feathers, Taphonomic Analysis, Chickens*

Animal Economies of North Africa During the Islamic Expansion: Patterns of Animal Consumption in Urban Centers and New Data from Volubilis, Morocco

28th May

14:00 - 14:20

ID: 123

*Lisa Yeomans[1] , Corisande Fenwick[1], Asmae El Kacimi[2] , Elizabeth Fentress[3], Hassan Limane[2]

1: UCL Institute of Archaeology, London, UK

2: INSAP, Rabat, Morocco

3: independent researcher

*Presenting author (lisa.yeomans@ucl.ac.uk)

Changes in political economies associated with expansion of ruling entities into new areas transform all areas of daily life. The subsistence economy as well as household practices of keeping animals as a source of meat, eggs and milk is no exception. In North Africa, the economic role of animals following annexation of the region into the Roman Empire is well studied but changes following the Arab conquest of North Africa, the arrival of Islam and the emergence of new Muslim states in the early middle ages have received less attention. This paper presents new work on faunal remains from INSAP-UCL excavations of early Islamic Walila (Roman Volubilis) examining the supply of animals to the urban community. Together with diachronic analysis of published data from the wider region, we discuss the shifts in the animal-based economy of towns and suggest new lines of enquiry which will be perused during the zooarchaeological analysis as part of the EVERYDAYISLAM project.

Keywords: *Islamic; Urban Economy; North Africa; Medieval*

Application of 3D Scanning and Printing for Fieldwork Identification

28th May

14:50 - 15:10

ID: 122

*Stephanie Frances Emra

SNSB, Munich, Germany

*Presenting author (emra@snsb.de)

The building and maintenance of an osteological reference collections is a costly, time-consuming, and practically challenging undertaking, especially for collections for use in the field. In 2024 the Bavarian State Collection for Palaeoanatomy (SPM) piloted its first 3D printed reference collection, made from scans of the osteological collection of the SPM, on a fieldwork campaign in southeastern Türkiye. Having this replica collection greatly facilitated the identification of tricky specimens and more generally sped up the identification process.
This presentation will discuss the advantages and disadvantages as well as the process of the creation of virtual and 3D printed reference collections for use in the field and other uses. Considerations of replication quality, associated costs, labour needed, and environmental impact will be addressed.
For 2025, the SPM plans to build upon this reference collection and has recently purchased a new high-quality 3D printer for this purpose. Further digitisation of the SPM osteological collection, as well as facilitating data sharing of 3D scans between institutions is also planned for the future.

Keywords: *3D scanning, 3D printing, Identification, Curation*

SLZOO: A Digital Gateway to the Zooarchaeological Database of the Southern Levant

28th May

15:10 - 15:30

ID: 133

*Lee Perry-Gal[1,2], Zohar Turgeman-Yaffe[1,2], Roee Shafir[2], Reuven Yeshurun[2], Guy Bar-Oz[2]

1: Israel Antiquities Authority, Jerusalem, Israel

2: Laboratory of Archaeozoology, School of Archaeology, University of Haifa, Israel

*Presenting author (leepg@israntique.org.il)

We present the Zooarchaeological Database of the Southern Levant (SLZoo)—a collaborative digital platform designed to showcase and analyze zooarchaeological data from sites across this region. Considering as an ongoing pilot project and currently under development, the project is a joint initiative of the Laboratory of Archaeozoology at the School of Archaeology and Maritime Cultures, University of Haifa, and the Israel Antiquities Authority, funded by the Israeli Ministry of Innovation, Science, and Technology. The platform, accessible as a website, leverages GIS-based methodologies to process and analyze extensive zooarchaeological datasets from excavations conducted by the Israel Antiquities Authority and universities. It offers three core features:

1. Comprehensive information on zooarchaeology in the Southern Levant.
2. An interactive site map for visualizing and comparing faunal remains from different archaeological sites across various historical periods (Prehistory, Biblical, Classical, and Middle Ages). Users can refine searches by site or species, and clicking on a site provides key zooarchaeological data with bibliographic references.
3. An advanced analytical tool enabling comparative analysis of two maps simultaneously, displaying species distribution/faunal remains from specific periods. Statistical tables offer a structured data overview.

At this stage, the website is not yet live but is stored on a cloud server; a URL link will be provided during the presentation. We encourage users to explore and interact with the platform, discovering patterns and trends while contributing their own zooarchaeological data—helping to expand and refine the dataset over time. This project enhances the accessibility and role of the Southern Levant zooarchaeological data, fostering collaborative research both locally and globally.

Keywords: *Zooarchaeological Database, Israel, GIS, Maps, Website*

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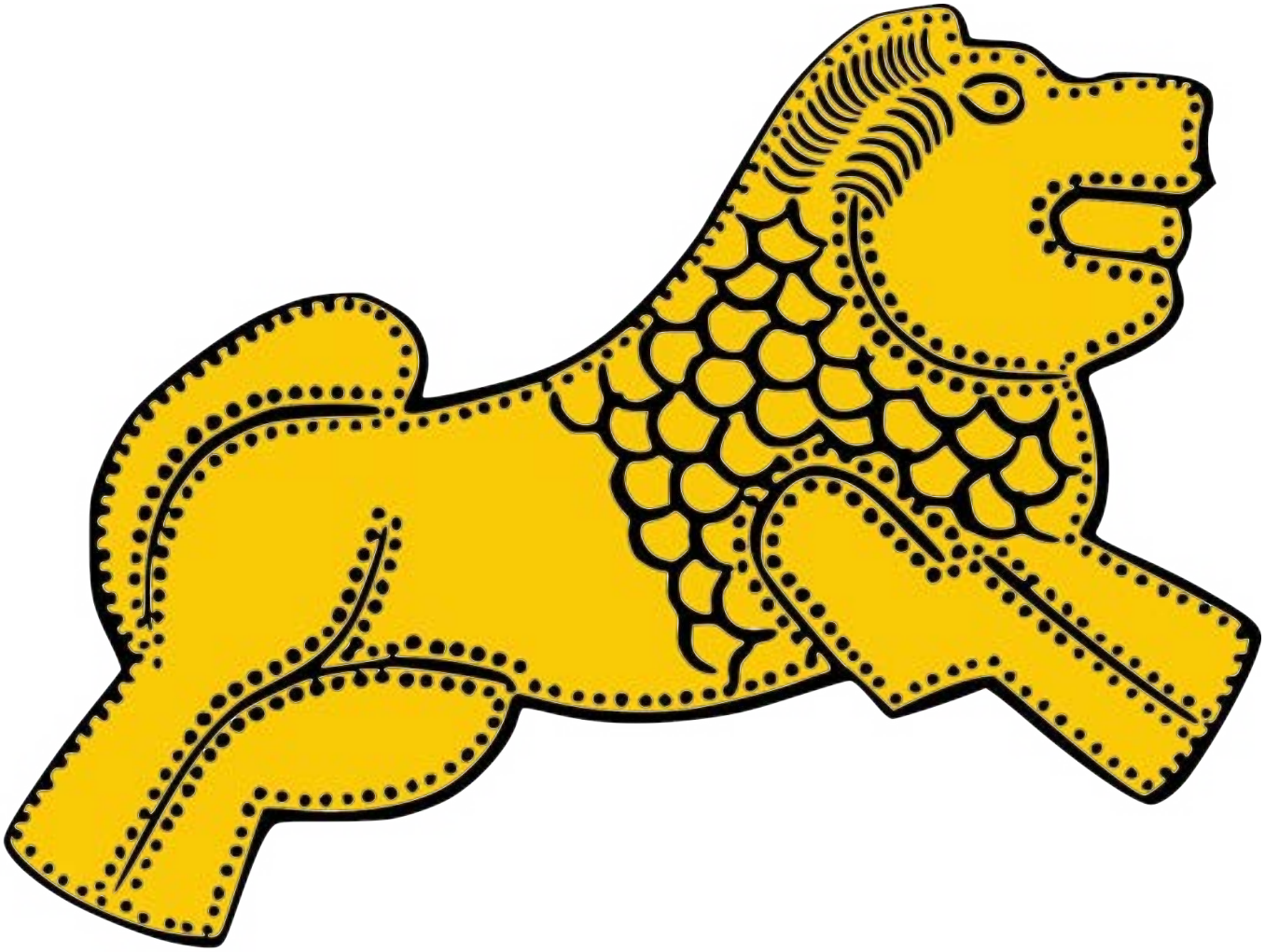

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