Book of Abstracts

Zooarchaeology at the Crossroads: Cultural Practices and Environmental Information from Faunal Evidence

Faculdade de Letras da Universidade de Lisboa
School of Arts and Humanities of the University of Lisbon
3 e 4 Julho de 2025
3 a 4 of July 2025

PROGRAMA/PROGRAMME

	3 de Julho	**Sala B112.B (Edifício da Biblioteca)**
9h30		**Abertura/ Opening**
9h50	Mariana Mondini	Zooarchaeology, the Anthropocene and the Global South: a situated case study in Andean South America
10h10	Shaw Badenhorst	Distinguishing Hominin and Brown Hyaena (*Parahyaena brunnea*) Faunal Accumulations from Middle Stone Age Shelters in South Africa
10h30	Jean-Denis Vigne	How doing it without aurochs? The example of the Cyprus PPNA.
10h50		***Coffee-break***
11h10	Lizzie Wright	Investigating cultural and economic change in Central and Northern Europe during the 3rd Millennium BC: a zooarchaeology and lipid residue analysis approach
11h30	A. Sebastián Muñoz	Long-term human-otariid relationships in Southern Patagonia Atlantic coast. Past and present research agenda
11h50	Hitomi Hongo, Marjan Mashkour, Akira Tsuneki, Ahmed Saber	Various aspects of the subsistence economy at the PPN and PN sites of Charmo (Jarmo), Iraq. Consumption patterns and bone tool and object production
12h10		***Discussão/ Discussion***
12h30		***Almoço/ Lunch***
14h	Hossein Davoudi, Marjan Mashkour	Urban Economy During the Bronze and Iron Ages in Northwestern Iran: Insights from Archaeozoological Research at Tepe Hasanlu
14h20	Arati Deshpande-Mukherjee, Anindya Sarkar, Torsa Sengupta and Tarannum Caur (online)	From Megalithic builders to beginning of urban life in South India: Preliminary investigations into their animal based subsistence economy
14h40	Ma Xiaolin (online)	Analysis of Worked Bone Materials from the Western Zhou Site of Lijiayao in Sanmenxia City, Central China
15h00	Laura Beovide, Marcelo Fleitas, Johanna Gómez	Assemblage of a set of pendants in *Urosalpinx haneti* (ca. 800 to 400 yr. BP), Arazatí, Uruguay
15h20		***Coffee-break***
15h50	Erika Gál	Main results of the zooarchaeological analyses of Late Copper Age burials in Transdanubia
16h10	Angelos Hadjikoumis	Managing and hunting animals in the uplands of Cyprus: cultural and environmental components
16h30	Suzanne E. Pilaar Birch	Domestic and Sacred Animal Use on Bronze Age Sicily: The Case of La Muculufa

16h50	Richard Madgwick, Leia Mion, Leah Reynolds, Hongjiao Ma, Angela Lamb, Peter Guest, Viano	Feeding the Roman Army in Britain: Multi-isotope evidence for supply and management on the northern frontiers
17h10		***Discussão/Discussion***
	4 de Julho	**Sala B112.B (Edifício da Biblioteca)**
9h30	Christian Gates St-Pierre & Marie-Ève Boisvert	Hidden Patterns: Rethinking Variability in Iroquoian Tool-Making
9h50	Albérico Nogueira de Queiroz, Olivia Alexandre de Carvalho (Coordinators), Roberta Richard Pinto	Digital Optical Microtraceology in Biocultural Contexts: Zooarchaeological Case Studies at the Furna do Estrago (Pernambuco) and Justino (Sergipe) Sites, Brazil
10h10	Pacheco et al. (Presented by Albérico Queiroz)	Paleometric and Zooarchaeological Characterizations of the Megafauna from Santa Elina, MT: Crossing Strategic Gaps in Knowledge About the Human Occupation in the Americas
10h30		***Coffee-break***
10h50	Queiroz et al.	Educational Actions: Natural and Cultural Heritage - Working with Zooarchaeology in Elementary Schools in Laranjeiras City, Sergipe, Brazil
11h10	Joaquín Arroyo-Cabrales and Federico Sánchez-Quinto	Advances on Paleogenomics studies in Latin America
11h30	Melanie Filious	Rethinking dingoes based on new evidence from multi-disciplinary analyses of ancient genomes.
11h50	Pinhasi et al. (Presented by Albérico Queiroz)	PRIMARCHGEN: Archaeogenetics of Non-Human Primates form Archaeological Sites Worlwide, with an Emphasis on aDNA from Pathogens (Past Interaction Between Humans and Other Primates)
12h10		***Discussão/ Discussion***
12h30		***Almoço/ Lunch***
14h	Rosalind E. Gillis	A Duck's tail: The complex domestication pathways during the Muscovy Duck domestication.
14h20	David Orton, Jen Harland	Synthesis of cod size-at-catch data from northern Scotland indicates limited impact of pre-industrial fisheries
14h40	Diana Carvajal Contreras, María de los Ángeles Duran	Fishing at a Formative Site in the Colombian Caribbean: The Case of Sueños de Libertad Site

15h00	Marta Moreno-García, Pilar Diarte-Blasco, Manuel Castro Priego	Goat rearing: a farming strategy for coping with droughts in early medieval inland Spain?
15h20		***Coffee-break***
15h50	Plan Shenjere-Nyabezi	Non- food animals as evidence of cultural practices in the farming communities of southern Africa
16h10	Eve Rannamäe (online)	The latest advances in Estonian zooarchaeology – an overview of the arrival of selected species
16h30	László Bartosiewicz,	Animal remains from the Migration Period ring fort of Treby borg (Öland, Sweden)
16h50		***Discussão/ Discussion***

Abstracts

Zooarchaeology, the Anthropocene and the Global South: a situated case study in Andean South America

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In this presentation I will discuss the relevance of dealing with a long-term perspective of the Anthropocene not just to the full understanding of its origins but also to its bearings in our present and future. A more systematic inclusion of the Global South in the empirical database to discuss these issues is advocated. The perspectives emerging in this region may also enrich the outcomes. Zooarchaeology is in a privileged position to understand the origins, development and varied trajectories of the Anthropocene, as it deals with human interactions with other animals. I will illustrate this with a case study from an Andean high valley, El Bolsón, located in Catamarca province, Argentina. The zooarchaeological and taphonomic studies we are carrying out there, along with other lines of evidence, are helping disentangle the roots of the Anthropocene in the local and regional scale, as well as regarding the present and future interactions with faunas from an informed perspective.

Distinguishing Hominin and Brown Hyaena (*Parahyaena brunnea*) Faunal Accumulations from Middle Stone Age Shelters in South Africa

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The role of carnivores in shaping faunal assemblages at archaeological sites is a key focus in studies of the Middle Stone Age (MSA) site formation processes in southern Africa. Two recent studies provide methodological advancements for distinguishing between anthropogenic and carnivore-driven bone accumulations, particularly those attributed to brown hyaenas (*Parahyaena brunnea*). Brown hyaenas, known as scavengers and bone accumulators, regularly feed on other carnivores, leaving distinct assemblages that are often enriched with carnivore taxa compared to those accumulated by hominins. By using the Carnivore-Ungulate Ratio and the Carnivore Richness Index, it is possible to successfully distinguish between hominin and brown hyaena samples at MSA sites in southern Africa. These differences suggest that brown hyaena accumulations are characterised by a greater diversity of carnivore species and higher frequencies of carnivore remains, reflecting their dietary habits and scavenging behaviours. When used alongside other taphonomic indicators, such as bone surface modifications, these indices provide a powerful tool for identifying the agents responsible for bone accumulation. Together, these studies highlight the utility of combining quantitative indices with taphonomic analyses to differentiate between brown hyaena and hominin contributions. The integration of these

findings advances our understanding of MSA site formation processes and provides a framework for interpreting complex faunal assemblages where hominin and carnivore activities overlap. These approaches not only enhance the identification of accumulators but also contribute to broader interpretations of hominin subsistence strategies, carnivore ecology, and human-carnivore interactions during the MSA.

How doing it without aurochs? The example of the Cyprus PPNA.

Jean-Denis Vigne
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Aurochses occupy an important place in the prehistoric and protohistoric bestiary of Europe and Southeast Asia. This is particularly true in the Levantine and Anatolian Early Neolithic, where figurative representations and horn or head trophies abound. The island of Cyprus, where the main cultural features of the first Pre-Pottery Neolithic (PPNA) were imported at the beginning of the 9th millennium cal. BC but where the wild boar is the only ungulate present, offers an interesting opportunity to study the rearangement of the bestiary in a world devoid of ruminants. Archaeozoological analysis of the large faunal assemblage in the PPNA village of Klimonas (Ayios Tychonas, Limassol) reveals a number of symbolic practices involving wild boar. Some of these suggest the transfer of symbolic valences from the aurochs to the wild boar, with the tusks representing the bovid's horns.
Keywords: Bestiary, PPNA, Cyprus, Levant, Wild boar

Investigating cultural and economic change in Central and Northern Europe during the 3rd Millennium BC: a zooarchaeology and lipid residue analysis approach

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The 3rd Millennium BC was a major period of cultural and demographic transition in Central and Northern Europe, with the appearance of the Corded Ware Culture, which has been linked to a series of human migrations from the Pontic-Caspian steppe region. Zooarchaeological work has indicated that this may also have been a time of economic and agricultural change, with evidence for a shift in cattle husbandry in some areas. However, it is not known how widespread this shift was or whether or not it can be linked to the arrival of new human groups.
This paper will present some preliminary results from a project bringing together zooarchaeology and lipid residue analysis, focusing on material from two European areas with settlement sites attributed to the Corded Ware Culture: Switzerland and the Netherlands. In this project we consider the evidence for a shift in cattle husbandry, with the potential for an intensification of dairy use at this time.

Long-term human-otariid relationships in Southern Patagonia Atlantic coast. Past and present research agenda

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Otarids have been an important resource for human populations in southern Patagonia since early Holocene. Human-otarids relationships involved a range of variation in the past, which the ethnographic records illustrate as ranging between maritime hunter-gatherers in the southwestern part of the continent to pedestrians on the eastern Patagonian coast. Partly because past sea level variations make it difficult to preserve the oldest records, partly because of the geographical extension of the litoral area, zooarchaelogical information from the latter sector, the Atlantic coast, has been more scarced than from the southwest. During the last twenty years, we have carried out an archaeological research program south of the Santa Cruz River aimed to revert this situation. The research agenda included establishing the a time frame for human-otariid interactions in the past, identifying the species that were captured at different loci, the contexts in which these captures occurred, the seasons of the year in which these activities were implemented, the kinds of individuals selected and the ways in which their carcasses were processed. We also developed a naturalistic taphonomic program to evaluate the timing and mode skeletal remains of these marine mammals' recicles in costal environments. In this presentation, we account for the current state of knowledge on these different lines of research and discusses their contribution to establish a new step over which to develop the agenda for the coming years.

Various aspects of the subsistence economy at the PPN and PN site of Charmo (Jarmo), Iraq. Consumption patterns and bone tool and object production

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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 Pre-Pottery 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 in smaller numbers. The relative frequency of these taxa did not change between PPN and PN. Caprine and most of the bovines bones from both PPN and PN contexts come from domestic variety. During the last study campaign a pilot program of paleoproteomic

study was also initiated. Apart from consumption, the bones of the herded or hunted animals were also exploited as raw material for producing tools and objects. Identifications were realized by MALDI-FTICR and LC-MS/MS. The identified taxa by ZooMs are bovines, possibly cervids, goat, sheep, suids, gazella.

Urban Economy During the Bronze and Iron Ages in Northwestern Iran: Insights from Archaeozoological Research at Tepe Hasanlu

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Northwestern Iran, at the crossroads of the Caucasus, the Iranian Plateau, Northern Mesopotamia, and Anatolia is a key region for prehistoric and historical archaeological research. Tepe Hasanlu is an ancient site known for its long-term occupation and extensive excavations, as well as comprehensive studies of its cultural materials. During the Middle to Late Bronze Ages and Iron Ages I and II, Tepe Hasanlu emerged as a key urban center, interacting closely with neighboring regions, particularly Assyria. The faunal remains excavated in 1970, 1972, and 1974 by the University of Pennsylvania and stored in the Osteology Department of the National Museum of Iran offer a unique opportunity to explore the economic landscape of this area during significant social and political transformations such as urbanization and the rise of empires.
This talk will focus on the recently generated results of the faunal remains. Sheep, goat, and cattle constitute the primary animal resources across all periods. A large amount of equid remains show the presence of hemiones as hunted species while the domestic ones including horses, donkeys, and mules were used during the Iron Age as draught animals and for transportation.
The faunal spectra at Tepe Hasanlu closely resemble those of Haftavan and Dinkhah during the Bronze Age, and to Bastam, Qalaychi, and Ziwiyeh during the Iron Age. In comparison to the neighboring Anatolian region, the main difference between this site with other contemporaneous sites in Iran is the low ratio of pig in the Iranian sites.

From Megalithic builders to beginning of urban life in South India: Preliminary investigations into their animal based subsistence economy

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In South India particularly in the state of Tamil Nadu a large number of sites have been excavated belonging to the iron age/megalithic, and historic periods. While many of these

have been studied for their cultural remains such as inscriptions, ceramics, material objects, sculptures, etc. their excavated faunal material have remained largely ignored. It is only at a few sites like Sanur that animal remains have been studied. The Iron Age/Megalithic period is characterized by its variety of human burials such as cist, urns, dolmens, pottery, iron objects, etc. As it is significantly important for the introduction of iron and providing the impetus to the growth of urbanism in the region, the role of animals needs serious consideration. Here are presented preliminary observations on the ongoing archaeozoological studies for some of the sites in Tamil Nadu such as Kodumanal, Sivagalai, Keeladi, etc. These are giving important insights into the various aspects of animal exploitation in the past like diet, craft specialization, agriculture, etc. For more information about the human animal interactions the Sangam text an important literary account of the Early historic period is also being consulted.

Analysis of Worked Bone Materials from the Western Zhou Site of Lijiayao in Sanmenxia City, Central China

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Bone tools and workshops are commonly found at the sites of Bronze Age in China. Previous studies have mainly focused on the description of bone tools and workshops, while the technological observation and quantitative analysis have been neglected by scholars. In recent 15 years, as more and more attention is paid to the development of ancient economy and technology in archaeology, the study of bone artifacts has gradually attracted the attention of archaeologists in China. This paper systematically analyzes the worked bone materials from the Lijiayao site in Sanmenxia, central China, in an attempt to reconstruct the process of worked bone making and construct the technological pattern of craft industry in the Western Zhou Dynasty.

Assemblage of a set of pendants in *Urosalpinx haneti* (ca. 800 to 400 yr. BP), Arazatí, Uruguay.

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Before the European conquest, between 512-533 cal yr. BP, in the area of an indigenous settlement located in the Pereira stream, Rio de la Plata coast, two children approximately aged 4 and 6 were buried. Both burials had ornaments made on *U. haneti* (marine gastropod) and covered by a layer of ochre.
As the archaeological research on the coast of Río de la Plata progressed, the study of this multiple burial recovered by amateurs at the beginning of the 20th century was resumed.

The typological study of the shell ornaments of ca. 800 pieces has been advanced and the production processes of the beads and pendants that compose it by means of taphonomic, traceological and experimental approaches.
This paper presents the results of traceological study linked to the pendants assemblage in *U. haneti*.
As with the study already carried out with the shell beads from the grave goods, they were observed at different magnifications (8 to 40X) using a ZEISS Stereo Microscope, model Stemi 305 Trinocular, and samples were taken for analysis of microbotanical remains in order to advance in the determination of the type of fiber with which the pieces were assembled.
As a result, a pattern of traces linked to the assemblage of pendants in *U.haneti* was identified, discriminating them from taphonomic and production traces, as well as an approximation to the type of plant bast fibre used. The results are discussed based on regional contextual and ethnographic information.

Main results of the zooarchaeological analyses of Late Copper Age burials in Transdanubia

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The lecture presents the main results of the zooarchaeological study of the animal bone assemblages from twelve cemeteries or solitary burials in Transdanubia as part of the project targeting the complex analysis of the Late Copper Age burials in the Carpathian Basin. The results are presented according to the four main types of burials: (I) formal cemeteries located far from settlements, (II) formal cemeteries located close to settlements, (III) settlement burials, and (IV) atypical settlement burials.
In terms of their role, the studied animal bones could be grouped into three main categories: (1) sacrificial animals and animal heads placed in burials for ritual purposes, (2) food offerings, as well as butchery and food remains ending up accidentally in the graves, and (3) bone, antler and tusk artefacts and ornaments. The most impressive archaeozoological finds are the single or double animal burials and the human-animal burials owing to the well-preserved skeletons and the wealth of information shedding light on the context and origin of these interments.
Worked bones, antlers, and tusks represented a small, but rather diverse group of animal finds. In addition to the common artefacts known from the Baden period such as bone and antler awls and bevel-ended tools, hafted antler implements, and drilled pig tusk objects, a few unique decorative items and implements have recently been found. Thirteen drilled dog canines placed in a female burial and the thong-smoother made on a cattle mandible, the single bone tool found in the burial of the 6–10-year-old child, were the most remarkable specimens. If it had belonged to the child, it may point to the involvement of children in strap-making.

Managing and hunting animals in the uplands of Cyprus: cultural and environmental components

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The habitation of the interior uplands of Cyprus during the Neolithic has only recently been established. It is now known that people did not only move between the coast and the interior but also that they permanently lived there. Beyond these basic facts, little else is known. Hence, the zooarchaeological study of human-animal interactions in the uplands has the potential to shed light into the lifeways developed in upland environments and how these compare with the coastal lowlands. The newly excavated site of Upper Roudias adds to the still small but growing list of Neolithic upland sites in Cyprus and enables a first attempt at synthesising what is known so far about human-animal interactions in the uplands. Analysis of the small Upper Roudias assemblage, in comparison with other upland sites, suggests similarity between uplands and lowlands at least for the 7th millennium cal. BCE. The emerging picture is one of an animal economy based mainly on animal husbandry, rather than hunting, although this contrasts the little that is known about the uplands during the preceding 8th millennium cal. BCE. With the integration of zooarchaeological data from the more abundant coastal sites, a preliminary synthesis for the Cypriot Neolithic is presented, focusing on the interplay between environmental and cultural factors shaping human-animal interactions.

Domestic and Sacred Animal Use on Bronze Age Sicily: The Case of La Muculufa

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The Bronze Age site of La Muculufa sits 15km inland from the mouth of the Salso River in south-central Sicily, atop a limestone outcrop of the same name. The site was occupied 2300-2100 BCE, corresponding to the regional Castellucio culture. It consists of a village area, 200 chamber tombs cut into the hillside, and a sanctuary that would have served as a central meeting place for those in the valley below. The majority of decorated sherds recovered from the site were derived from the sanctuary. These included unique motifs not found anywhere else at the site, reinforcing its special status. Over 6,700 faunal remains were recovered during excavations that took place 1982-1991 with notable differences between the village and sanctuary contexts. Caprines were more common in the sanctuary (85%) than in the village (65%), while pig and cattle were found to have higher relative abundances in the village. Sanctuary caprines were killed at or before 1 year of age; village caprines reached 2 years of age; and pigs and cattle generally reached 3.5-4 years old. It

seems likely that caprines at the sanctuary were consumed in a ritual manner and potentially brought as offerings from elsewhere in the valley. This paper discusses the results of stable isotope analysis and ZooMS to highlight the differences in animal management between species and between animals raised for domestic and sacred use at the site. Our findings demonstrate the utility of applying archaeological science techniques to legacy collections in order to add nuance to our understanding of past human-animal interactions at the crossroads of environment and culture.

Feeding the Roman Army in Britain: Multi-isotope evidence for supply and management on the northern frontiers

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How did the Roman Empire supply its very large frontier garrisons? Maintaining provision was key to the success of Roman imperialism, but we still know remarkably little about how Romans soldiers on the frontiers were supplied and the impact this had on the provincial countryside and its population. This paper seeks to address these issues using a multi-isotope approach applied to domestic fauna in three frontier regions of *Britannia*: South Wales, Hadrian's Wall and the Antonine Wall.
Using a combination of strontium, sulfur, carbon and nitrogen isotopes the research explores how the challenges of sustaining armies were met in the early phases of frontier establishment. A major theme is the scale and nature of supply networks that were utilised to support the different zones including the degree to which supply (whether through trading or raiding) came from beyond the frontier. In addition, animal and landscape management strategies are explored to examine the degree of standardisation, the impact on the local environment and the products that were required by the army. These themes are compared between the frontier zones and contrasted in the context of the different site types - legionary fortresses, auxiliary forts and rural settlements.

Hidden Patterns: Rethinking Variability in Iroquoian Tool-Making

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Archaeological bone industries have traditionally been analyzed in terms of forms, functions, and types. More recent technological analyses have shed light on new dimensions of these industries, including the sociocultural choices shaping various *chaines opératoires* and technological styles. As a result, bone tools assemblages once perceived as lacking standardization and sophistication actually reveal a complex

sociotechnical organization that unfolds within communities of practice, which are now receiving greater attention. This will be illustrated through a case study from precolonial North America, which also exemplifies the interplay between Indigenous Peoples and the faunal resources of their environment.

Digital Optical Microtraceology in Biocultural Contexts: Zooarchaeological Case Studies at the Furna do Estrago (Pernambuco) and Justino (Sergipe) Sites, Brazil

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Digital optical microtraceological studies on faunal bones contribute information about interactions between humans and animals, based on the analysis of the diversity of modeling techniques for bone materials, which are based on the principle of visualizing in detail the intentional morphological and structural variations. The cortical and medullary structures of bones can also contribute information about the microenvironment, highlighting changes caused by ecological stress, resulting from medium to long-term environmental variations, and can also reveal evolutionary, zoogeographic and osteopathological aspects. In both case studies, it was possible to observe variability in bone modeling techniques in at least three groups of animals, according to occurrence and recurrence of these intentional marks which consisted of straight cuts with circular and concentric grooves on the external and internal faces of the diaphyses of the long bones of small animals, indicating removal of the proximal and distal epiphyses also with with polishing in the cortical region. Knowledge of these manufacturing techniques at a microscopic level allows us to understand another type of human-animal relationship which transcends subsistence and moves towards a context of rituality, in addition to other possible ones.

Paleometric and Zooarchaeological Characterizations of the Megafauna from Santa Elina, MT: Crossing Strategic Gaps in Knowledge About the Human Occupation in the Americas

Mírian Liza Alves Forancelli Pacheco[1], Thaís Rabito Pansani1[2], Albérico Nogueira de Queiroz[3], Mariela Cordeiro de Castro[4], Alexandre Ribeiro Cardoso[5], Elbio Leiguez Júnior[6], Águeda Vilhena Vialou[7], Briana Pobiner[8], Michael Cristopher Pante[9]

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More than 15 thousand years ago, it is likely that people used the Santa Elina shelter for some feasts. The today s special, each in its own time, were two giant sloths. We are trying in every way to understand what information we can rescue from the remains of these giant animals and what are the clues that human beings really had a barbecue in Prehistory. To date, no technique has shown itself to be more promising for accessing these issues than the micro-FTIR at the IMBUIA station. Santa Elina, MT, is one of the oldest archaeological sites in the Americas. One of the most intriguing questions about it is the possibility of interaction between humans and giant sloths that lived around 17 and 27 thousand years ago. We are investigating the preservation patterns of skeletons. One of the most important parameters to determine the degree of preservation of bones is the crystallinity of their inorganics. Apatite lattice is flexible for substitutions of ions. After death, the decay of the organics exposes a surface, which became highly reactive and affected by dissolution and infilling with other minerals. It can be informative to reconstruct paleoenvironments, but depending on the degree of alteration, can also overprint or erase original chemicals of bones, limiting their potential use as a reliable source of information for studies on diet, migrations, climate and vegetation reconstructions.

Educational Actions: Natural and Cultural Heritage - Working with Zooarchaeology in Elementary Schools in Laranjeiras City, Sergipe, Brazil

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At the current moment when the results of constant environmental changes have considerably impacted biomes and the populations that live there, on a global scale, the contribution of research in Zooarchaeology and Environmental Archaeology, integrated with inclusive and integrated educational processes, within universities and schools, has proven to be relevant in the production of knowledge and reflections on the complex system

of human relationships and interactions with nature for a long time, since it's a basis of resources responsible for the formation of societies, such as subsistence patterns, settlements and the development of biocultural processes of transformation of raw materials, memory, wisdom and production of traditional technologies since past periods, considering the various ecological aspects available in the materiality of archaeofaunal remains. In this sense, it's possible to adopt a set of pedagogical and recreational activities in elementary schools, which lead children and young people to awaken their interest in scientific discoveries through enjoyable educational instruments, such as games, readings and stories, which allow the development of perception and interest in animals and the affinities created with humans in the most varied forms over time.

Advances on Paleogenomics studies in Latin America

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Recent endeavors to construct a new international airport to the north of México City, revealed a large amount of Columbian mammoth (*Mammuthus columbi*) carcasses and isolated bones found at the site, accounting for more than 500 individuals. Additionally, there were bones pertaining to other Late Pleistocene mammals co-occurring regularly with mammoths, like Pleistocene camels, horses, and bisons, ground sloth, saber-toothed feline, dire wolf, skunks, foxes, as well as small mammals and other small vertebrates, like birds, snakes, and frogs, including a unique flamingo egg record. A inter-institutional research project was initiated along with the salvage project, and samples from several, large stratigraphic columns were collected, with analyses still ongoing. Among the projected analyses, assays for endogenous ancient DNA were undertaken by Dr. Sánchez-Quinto and his team at a dedicated facility at the International Laboratory for Human Genome Research at Juriquilla, Querétaro.
We screened 72 libraries from *M. columbi* for ancient DNA, authenticating the endogenous origin of 66 of them and molecularly sexing 43 individuals. We performed mitochondrial DNA (mtDNA) capture-enrichment experiments recovering 28 genomes with >10x coverage, and generated a >0.65x nuclear genome. Such data was compared to mitochondrial and nuclear reference sequences, respectively, from Columbian and woolly mammoths across North America and Eurasia, and performed phylogenetic and demographic analyses. Integrating demographic inferences from both datasets confirm previous findings of a hybrid origin for the Columbian mammoth deriving from the admixture of an ancestral woolly and a steppe mammoth lineage. This study is paramount to elucidate the evolutionary origin of the Columbian mammoth, the only mammoth species original to the American continent, providing valuable insights into the evolutionary trajectory of the *Mammuthus* genus as a whole, and helping to understand the extinction patterns that occurred to this iconic animal, either natural or anthropogenically or both driven.

PRIMARCHGEN: Archaeogenetics of Non-Human Primates form Archaeological Sites Worlwide, with an Emphasis on aDNA from Pathogens (Past Interaction Between Humans and Other Primates)

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Examining the past coexistence of nonhuman primates and humans allows us to investigate the interface that may have shaped their ecology and behaviour today. Owing to the progress made in genomic research, there is now ample opportunity to investigate this kind of interaction. For example, pathogen ancient DNA (aDNA) analysis or genetic identification of primate remains from ancient sites can be used to investigate the historical connections between humans and primates and provide precise cultural interpretations. Ancient patterns of the human-nonhuman primate interface shed light on important issues pertaining to the creation of human niches and the conservation of primates today. In this context, we can establish comprehensive genomic profiles for various non-human primate species from different archaeological sites around the world. This mapping would aim to understand the genetic diversity within and between species, trace evolutionary histories, identify extinct lineages, and explore the cultural implications of ancient primate translocation. In another perspective, it's also possible to identify and characterise aDNA from pathogens (viruses, bacteria, parasites) found in non-human primate remains, that involves not only detecting the presence of pathogens but also understanding their evolution over time, including any changes in virulence and host specificity.

A Duck's tail: The complex domestication pathways during the Muscovy Duck domestication.

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The domestication of Muscovy ducks (*Cairina moschata*) presents a unique and underexplored avenue for understanding the human-animal relationship leading to animal domestication as well as exploring the relationship between wild and domesticated populations in the past and present. The Muscovy are native to South America, and initial research suggests that they were domesticated in the Amazonia. They were kept and hunted by indigenous peoples in the Americas long before the arrival of Europeans. However, the natural range of the Muscovy overlaps with that of their putative domestication center,

which leads to questions about it domesticated status and whether their domestication actually took place once individuals were removed and transported to the Old World. Observations at the time of conquest, highlight the blurred relationship between people and ducks, where 'wild' ducks being kept alongside 'house' ducks, which continues to this day. At present, there is limited understanding of potential ecological, evolutionary, zoonotic, social, and economic consequences that this practice may have had on this species' wildness. What will be presented here are not answers but questions, and answers to these questions may lie within a detailed morphometric and genetic analysis of modern, museum and archaeological specimens from contexts across Americas, Southeast Asia and Europa mirroring the journey of the Muscovy duck from its home land.

Synthesis of cod size-at-catch data from northern Scotland indicates limited impact of pre-industrial fisheries

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Industrial fisheries are known to have had severe impacts on marine fish stocks globally. The potential cumulative impact of previous, lower-intensity catches is much harder to evaluate: with systematic records rarely reaching back more than a century, zooarchaeological remains – with all their limitations – often represent the main, or only, source of evidence. In the case of North Sea demersal fisheries, industrialisation is represented by the introduction of steam-powered trawlers in the late 19th century, but this was preceded by almost a millennium of often quite intensive pre-industrial fishing.
Here we explore the beginnings of detectable human impact on northern North Sea cod via catch size data, aiming to test the hypothesis that a gradual size decline due to fishing pressure began prior to industrialisation. We present new bivariate and multivariate regressions for cod cranial bones and apply these to a dataset of around 700 individuals from 14 sites in northern Scotland spanning the 10th-19th centuries, along with recent commercial landings data for comparison. We observe a consistently bimodal distribution of cod size-at-catch throughout this dataset, with c.500mm and c.1000mm peaks that we take to reflect inshore vs. deep water fishing. While mean size does decrease from the 16th century, this appears to reflect changing fishing practices rather than reduced availability of larger fish: there is no sign of a decline in the upper peak, with appreciable numbers of c.1m fish evident even in the most recent archaeological material. This contrasts sharply with the modern data, in which this larger group appears absent. We conclude that pre-industrial fisheries had little to no detectable impact on northern North Sea cod sizes, while a dramatic decline took place in the decades following the introduction of the steam trawl.

Fishing at a Formative Site in the Colombian Caribbean: The Case of Sueños de Libertad Site

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The analysis of fish remains at the Sueños de Libertad site, Colombia, offers a comprehensive view of subsistence practices and the management of aquatic resources by pre-Hispanic populations. This study combines taxonomic and taphonomic approaches to identify the species and evaluate the processes of preservation and modification of the remains.
In addition, the research incorporates ethnoarchaeological information to interpret the cultural and economic importance of fishing in the Caribbean during the Formative (3300 BC). The integration of these methods makes it possible to reconstruct aspects such as capture strategies, fish processing and their role in diet and social dynamics of the past.

Goat rearing: a farming strategy for coping with droughts in early medieval inland Spain?

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Archaeological research on environmental change in the Iberian Peninsula during the Middle Ages has received increasing attention in recent years, due to concerns about the potential of droughts to influence the economic, social and political conditions in the Visigothic kingdom and al-Andalus between the 5th and 10th centuries CE. Yet to date, the response of animal husbandry strategies during these dry events remains underexplored. Here we analyse faunal assemblages recovered from Visigothic and Islamic contexts at the site of Reccopolis (Guadalajara, Spain) with the aim of investigating the expansion of caprine husbandry. Specifically, we find that the large number of goat remains recovered and their mortality profiles may reflect local or regional aridity conditions, rather than solely dietary practices related to the socioeconomic status of the inhabitants of this settlement. Our results highlight the need to comprehensively integrate aspects of livestock production and environmental data to improve our ability to understand the impact of droughts on medieval farming and historical events in Iberia.

Non-food animals as evidence of cultural practices in the farming communities of southern Africa.

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Until recently, analyses of faunal remains from farming communities (Iron Age) sites across southern Africa have tended to focus on remains of food animals such as cattle, sheep/goat alongside the wide variety of wild animals that were known to have been hunted for food. Wild animals that were generally believed to be non-food, especially predatory animals such as leopard, lions and reptiles such as crocodiles were identified and reported as part of the faunal assemblage, without much further attention. The exceptions may have been animals such as leopard, whose remains were usually considered and interpreted in the context of the export of their pelts as part of the external trading networks between southern Africa and the Persian world via the Indian Ocean coast. This paper uses ethnoarchaeological approaches to examine the significance of the exploitation of non-food animals for cultural practices during the Iron Age, using the Direct Historical Approach in analogical reasoning in archaeology where it is generally accepted that the contemporary populations of southern Africa are the direct descendants of the regional archaeological farming communities. Using ethnographic data, the paper explores the use of animals in cultural practices such as medicine, status symbols and a variety of ritual activities. In the final analysis, the paper argues for departure from the traditional focus on the analysis of faunal remains largely from a subsistence perspective

The latest advances in Estonian zooarchaeology – an overview of the arrival of selected species

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In recent years in Estonian archaeology, there has been increased focus on researching the introduction of domestic species to the region. Radiocarbon AMS dating, ZooMS, SPIN, ancient DNA, pottery lipid residue analysis, and of course, osteological studies have revealed new results and confirmed some of the previous knowledge. In this presentation, a brief overview is given of what we now know about the earliest known remains of the cattle (*Bos taurus*), sheep (*Ovis aries*), goat (*Capra hircus*), horse (*Equus caballus*), cat (*Felis catus*), chicken (*Gallus gallus domesticus*), and turkey (*Meleagris gallopavo*). Additionally, some of the recent work on the European bison (*Bison bonasus*) is presented. The findings are discussed in a wider context of past societies and neighbouring regions.

Animal remains from the Migration Period ring fort of Treby borg (Öland, Sweden)

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The animal remains discussed in this paper originate from two different excavations of the same settlement, a triple stone construction discovered on the island of Öland in the Baltic Sea. The aim is to critically appraise differences possibly caused by excavation methods and mitigate their impact on interpretation.

The older, hand-collected material, brought to light in 1966, contained 1155 bone specimens (3538.6 g), most of which (NISP=592, 2914.4 g) was attributable to domestic livestock. Twenty-eight bird bones (16.9 g) could also be identified. In 2024, excavations utilizing water-sieving yielded an additional 374 specimens (907.9 g), showing a similar dominance of domesticates (NISP=324, 865.4 g). The 7 bird bones identified weighed only 8.2 g. While the fundamental trends shown by the two different assemblages are the same, the taphonomic difference must be taken into consideration during interpretation.

Since caprine remains dominated in both samples by NISP (hand-collected: 39,90%; sieved: 51.8%; i.e. 14.1 and 20.4 % by weight), the taxonomic richness of the tow sites was also worth comparing. The larger, hand-collected assemblage contained sporadic remains of wild mammals (hare and wild pig) as well as four times as many bird taxa as the smaller, sieved material.

Although the two excavations at Treby borg were carried out with almost six decades in-between and following different field protocols, the two assemblages reflect comparable patterns of meat consumption. The major difference can only be observed in the taphonomic properties of the material, the sieved material is far more diverse in terms of fragment sizes.