15th meeting of the ICAZ

Worked Bone Research group

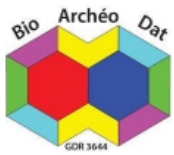
Séance de la Société préhistorique française

Programme and Informations

Paris 2024

With the support of the / avec le concours du :

WBRG, ICAZ, CNRS, Université Paris 1 Panthéon Sorbonne, Université de Barcelone, Université de Valence, UAR 3225 MSH Mondes, Département d'Histoire de l'Architecture et d'Archéologie de Paris - Pôle archéologique de la Ville de Paris, GDR BioarchéoDat, EUR ArChal, École doctorale 112 « Archéologie » de l'université Paris 1 Panthéon-Sorbonne, Société Préhistorique Française (SPF), DIM PAMIR, Musée d'Archéologie Nationale, Musée du Louvre, Musée de Cluny, Musée de la chasse, Musée de l'Homme (MNHN) et de l'Institut national de recherches archéologiques préventives (Inrap).



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Practical information

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Informations pratiques

15th WBRG international meeting

(Séance de la Société préhistorique française)

13 mai - 17 mai 2024

Meeting location and access / Lieu de la rencontre et accès

Institut national d'histoire de l'art (INHA) : 6 rue des Petits-Champs, 75002 PARIS
https://www.inha.fr/fr/index.html

Métro : Palais-Royal-Musée du Louvre (lignes 1 et 7), Bourse (ligne 3) or/ou Pyramides (lignes 7 et 14).

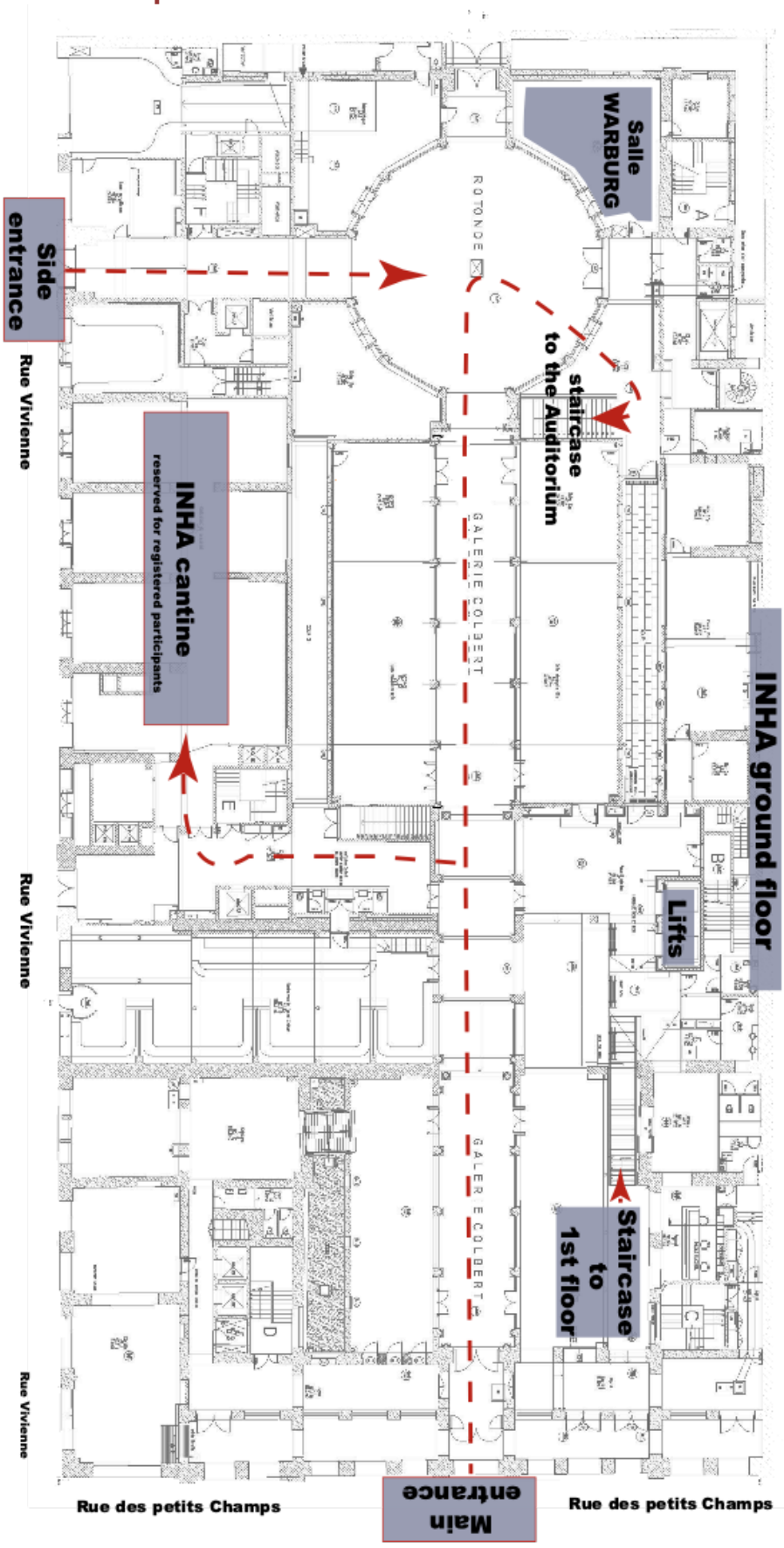
Where at INHA? / Où à l'INHA ?

Please note that the Meeting will not be in the same room during the 4 days /
La Rencontre ne sera pas dans la même salle pendant les 4 jours

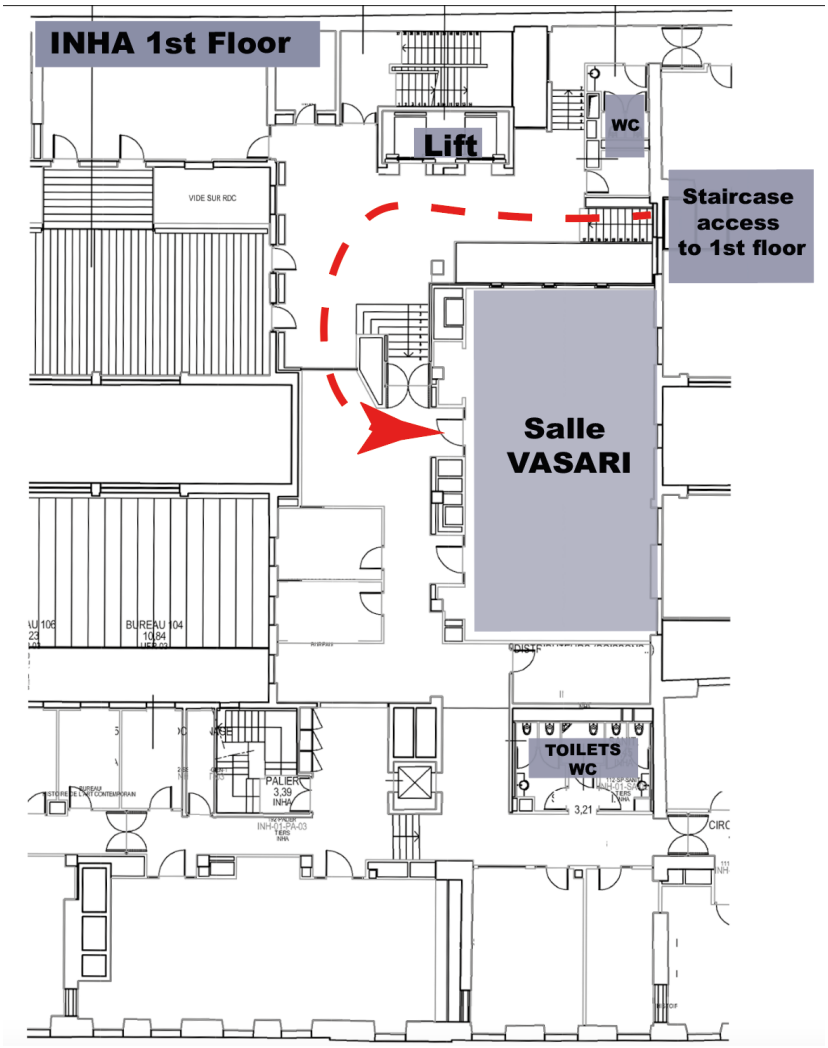
Lundi 13 et mardi 14 mai 2024 / Monday 13 and Tuesday 14 May 2024:
Auditorium Jacqueline Lichtenstein (Ground Floor, 192 places assises) : https://www.inha.fr/fr/l-institut/location-d-espaces/l-auditorium.html

Jeudi 16 et vendredi 17 mai 2024 / Thursday 16 and Friday 17 May 2024:
Salle Vasari (1st Floor, 100 places assises) : https://www.inha.fr/fr/l-institut/location-d-espaces/salle-vasari.html

INHA Ground floor plan



INHA 1st floor plan (for Thursday and Friday)



General schedule / Calendrier général

4 days with scientific exchanges (Monday, Tuesday, Thursday and Friday).

The topics of the sessions:

- **Session 1** – Appropriate experimental procedures
- **Session 2** – The study of raw material interactions: implementation and interpretation
- **Session 3** – From material productions to social structures and cultural traditions
- **Session 4** – Technical stability and change
- **Session 5** – Hard Animal Material industries, archaeometry and ethics: new advances?
- **Session 6** – Open session
- **Session 7** – Master and doctoral students forum
- **Session 8** – "Flash" communications and posters session

Excursions

Wednesday 15th May is free or devoted to visit various museums or to have free time at the discretion of participants. Visits are only open to conference speakers who have registered.
At the entrance of the museums, you will be asked for your name as registrations are nominatives

Please remember to take your WBRG badge, otherwise the entry will be refused.

Le mercredi 15 mai est libre ou consacré aux visites de divers musées ou à du temps libre au choix des participants. Seuls les communicants peuvent accéder à ces visites gratuites. A l'entrée votre nom vous sera demandé suite à votre inscription nominative.

Merci de penser à prendre votre badge WBRG, sinon l'accès vous sera refusé.

Welcome drink / Pot de bienvenu

The event will take place at the **Musée de la Chasse on Wednesday 15 May** (an off-day dedicated to excursions): speakers will be able to visit the Musée de la Chasse in Paris free of charge.

Il aura lieu au **Musée de la Chasse, le mercredi 15 mai** (journée off dédiée aux excursions) : les communicants pourront à cette occasion visiter gratuitement le Musée de la Chasse à Paris.

Adresse : 62 Rue des Archives, 75003 Paris
Métro : Saint Paul or/ou Hotel de Ville (Ligne/line 1)

Cocktail dinner / Diner de gala

Tuesday 14th May (19h - 22h):
Cocktail dinner on a barge parked on the banks of the Seine River (for speakers who have registered only).
Meeting point directly at "LA BARGE 2 University Restaurant"

Mardi 14 mai (19h - 22h) :
Cocktail dînatoire organisé sur une péniche stationnée sur les berges de la Seine (uniquement pour les communicants inscrits).
RDV à la péniche « Restaurant Universitaire LA BARGE 2 »

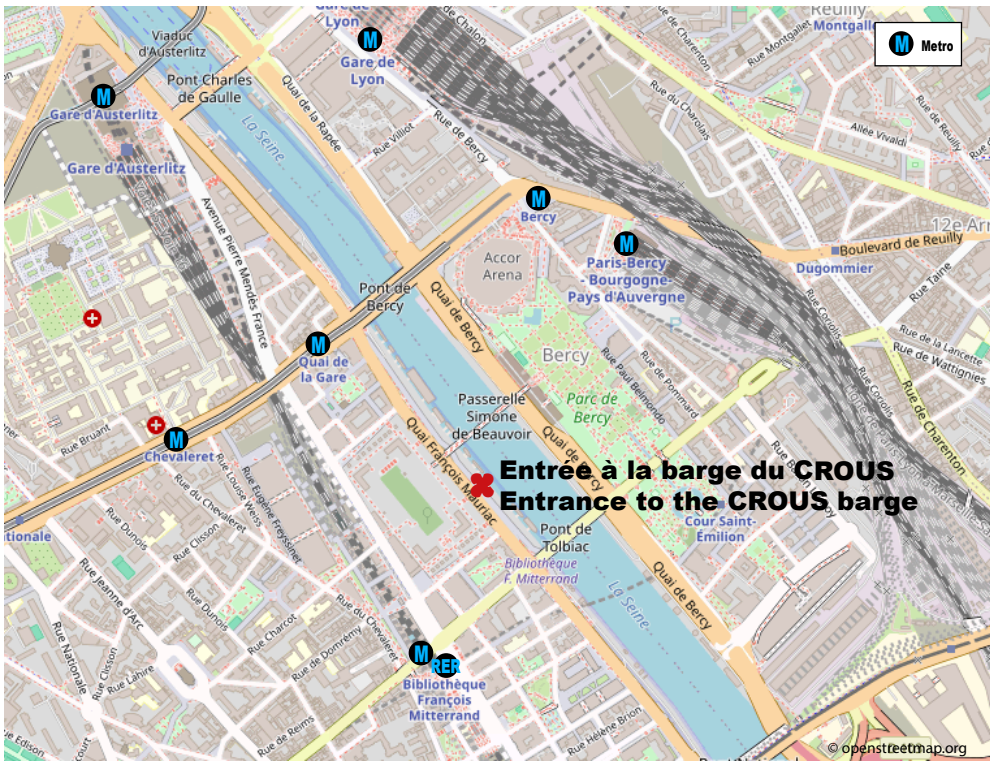
Adress / adresse : Quai François Mauriac, Port de la Gare, 75013 Paris

https://www.crous-paris.fr/restaurant/ru-la-barge-du-crous-de-paris-3/

Métro : Bibilothèque François Mitterrand (lignes 14 or/ou REC C) or/ou Quai de la Gare (ligne 6)

Please remember to take your WBRG badge!

N'oubliez pas de présenter votre badge WBRG !



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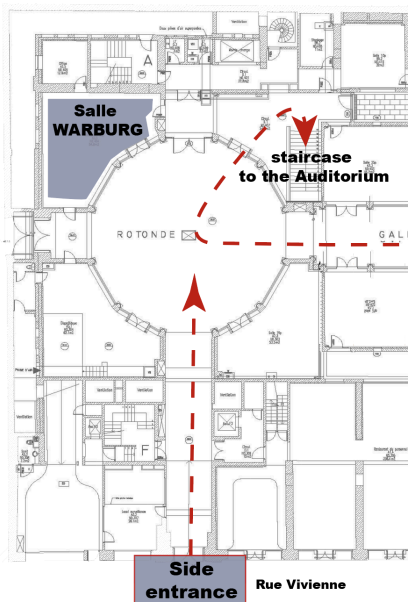
Coffee breaks / Pause-café

Coffee breaks will take place in the **Warburg Room** (ground floor). This room adjoins the rotunda and the gallery

Les pauses-café auront lieu dans **la salle Warburg (**rez-de-chaussé**).** Cette salle est attenante à la rotonde et à la galerie :



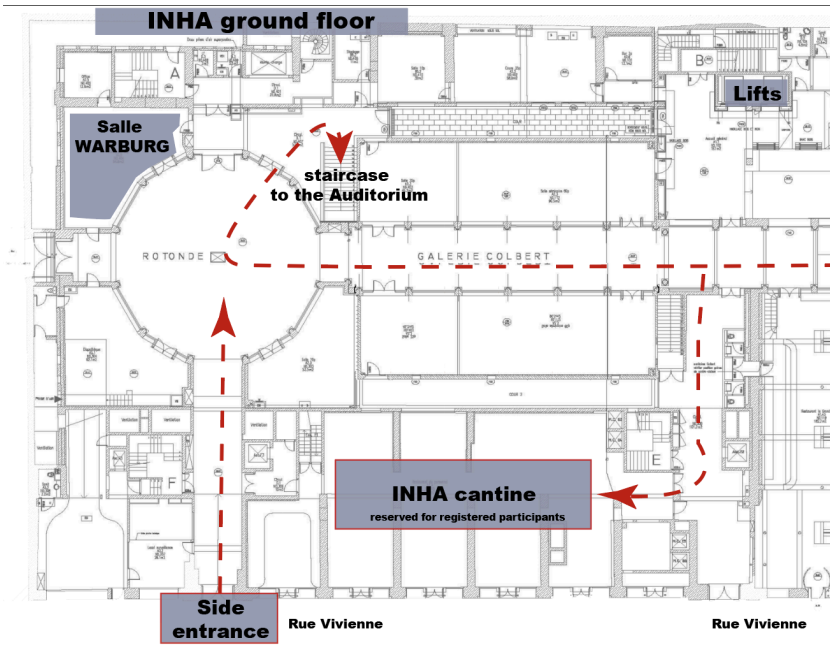
Lunch / Déjeuner

Lunches will take place in the INHA canteen and are reserved for registered participants only. This is a self-service restaurant and you can choose between the following options: 1 main course + 2 peripherals, or 1 vegetable plate + 3 peripherals**.**

Don't forget your vouchers for access to the canteen. They will be given to you on the day of your arrival at the conference with your badge.

Les repas seront pris le midi à la cantine de l'INHA. Ce repas sont réservés aux communicants qui s'y sont inscrits. Il s'agit d'un restaurant self-service et vous avez le choix entre les options suivantes : 1 plat principal + 2 périphériques, ou 1 assiette de légumes + 3 périphériques.

N'oubliez pas vos coupons pour pouvoir accéder à la cantine. Sans ces coupons, l'accès ne sera pas possible. **Ils vous seront donnés le jour de votre arrivée au colloque avec votre badge.**



Webinar / Webinaire

A link will be sent to all registrants (both speakers and listeners) before the conference and will be also available on the website.

Un lien de connexion sera adressé à tous les inscrits (communicants, comme auditeurs) avant le début du colloque et sera aussi accessible sur le site web.

WIFI / Network

Two separate wireless networks are available:

• The **Eduroam network** for students and staff from French and foreign institutions that are members of Eduroam. Access to the Eduroam network is immediate, permanent and subject to authentication delegated to the home institution.

• The **INHA network: Invitation to the day by email** is a wifi with authentication from a browser (Firefox, Chrome, Edge, Safari...) via a captive portal. Once selected, you should be automatically redirected to the INHA network authentication page. If you are not invited and you have a security warning, enter the following address in your browser: https://portailcaptif.inha.fr

You must select:
- "Invitation to the day by email" (on french: Invitation à la journée par courriel).
- Accept the terms of use by clicking on the box labeled "I accept" (en french: “J’accepte les termes”).
- Enter a valid e-mail address and click "Continue".
- You then will receive an activation link on your e-mail address. You have 10 minutes to click on the blue button in the message you received in your mailbox.
The access is valid for the whole day.

Deux réseaux sans fil (Wifi) distincts sont disponibles pour les visiteurs

- Le réseau **Eduroam** est réservé aux étudiants et personnels des établissements français et étrangers membres d’Eduroam
- Le réseau **INHA** est un wifi avec authentification à partir d’un navigateur (Firefox, Chrome, Edge, Safari…) via un portail captif (cf. instruction en anglais)

Guest lectures / Conférences invitées

• **Opening speech** / Discours inaugural:

Alice Choyke (Central European University, Medieval Studies, Hungary)
and
Hans Christian Küchelmann (Landesarchäologie Bremen, Allemagne)

"The Worked Bone Research Group and Forging Consensus on the Study of Worked Hard Osseous Materials"

• **Keynote speech** / Conférence invitée:

Sonia O'Connor (Bradford University, Angleterre):

"Raw Materials Identification: developments and limits"

ORGANISATION

Organisers and scientific direction

- **Marianne Christensen**, Senior lecturer, Univ. Paris 1 Panthéon Sorbonne, UMR 8068 – TEMPS (Bone industry, Usewear, technology, experimentation, hunter-gatherer, South America, Europe).
- **Nejma Goutas**, Researcher, CNRS, UMR 8068 – TEMPS (Bone industry, Technology, Experimentation, Upper Palaeolithic, western and eastern Europe).

Organisational and scientific committee

- **Marta Blasco Martín**, PhD-Professor (Assistant), Department of Prehistory, Archaeology and Ancient History, University of Valencia (Spain) (craftworks, hard animal materials, archaeometry, Metal Ages, prehispanic Mexico).
- **Jean-François Goret**, Archaeologist, Paris Department of the History of Architecture and Archaeology - Archaeological Center of the City of Paris (craftworks, hard animal materials, Middle Age, Modern period).
- **Alexandra Legrand**, CNRS, Research engineer, MHS Mondes, UAR 3225 (Bone industry, Usewear, technology, Neolithic, Mediterranean world, Europe).
- **Caroline Peschaux**, Post-doctoral Researcher, UMR 8068 – TEMPS (ornaments, technology, Upper Palaeolithic, Mesolithic, Europe).
- **Isabelle Rodet-Belarbi**, Research engineer – INRAP & UMR 7264 CEPAM, France (Archaeozoology, Bone industry, Roman, medieval and modern period, Europe).
- **Jose-Miguel Tejero**, Ramon y Cajal Program Senior Researcher. Departament d'Historia i Arqueologia. Barcelona University (Spain) (Bone industry. Technology, Experimentation, Upper Palaeolithic, Middle to Upper Palaeolithic transition, Europe, Near East).

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Please contact us preferably at this address: wbrg2024paris@univ-paris1.fr

Short scientific programme

Itemised on a daily basis

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Court programme scientifique

Détaillé par jour

DAY 1 / JOUR 1

MONDAY 13th May— LUNDI 13 Mai

Ground floor / Amphithéâtre RDC

8h30 - 9h30 — Welcoming participants / Accueil des participants / Coffee

9h30 -9h45 — Introduction by the organisers / Introduction par les organisateurs

9h50 - 10h05 — **Opening speech / Discours d'ouverture**

Alice Choyke and Hans Christian Küchelmann:

The Worked Bone Research Group and Forging Consensus on the Study of Worked Hard Osseous Materials.

Session 1 and 2 –

Appropriate experimental procedures / Raw material interactions
Du bon usage de la démarche expérimentale / Interactions entre matériaux

Chairmen: Hans Christian KÜCHELMANN and Petar ZIDAROV

10h10 - 10h30 — **Christian Gates Saint-Pierre* & Jessica Labonté**
« Of Beaver Teeth and Humain Hair: A Tale of Two Experiments in Bone Usewear » (présentiel/in person)

10h30 - 10h50 — **Thaís Pansani*, Briana Pobiner, Agueda Vialou, Loic Bertrand & Mírian Pacheco**
« Giant sloth bone ornaments from the Last Glacial Maximum of Brazil: what do we know and what else can we ask? » (présentiel/in person)

10h50 - 11h10 — **Nélida Marcela Pal, Víctor Vargas Filgueira, J. Guillermo Ortiz, Oriana Hernandez Herrero & Angélica M. Tivoli*** (présentiel/in person)
« Microwear analysis on bone pointed artefacts: An experimental approach »

11h10 - 11h30 — **Miriam Luciañez Triviño & Corina Liesau Von Lettow-Vorbeck***
« Ivory "segmentation" procedures with copper-based tools. Archaeological and experimental evidence » (visio/online and présentiel/in person)

11h30 - 11h50 — **DISCUSSION (20')**

11h50 - 13h15 — Lunch break (1h30)

13h15 -13h35 — **Hildegard Müller*, Dorota Wojtczak, Nicole Reynaud Savio & Aurélie Schenk**
« Sledge runner or tool? Experimental and micro-wear approaches in the study of Roman and Iron Age bones from Avenches, Switzerland » (présentiel/in person)

13h35 -13h55 — **Mélanie Ferras**
« Flat and Twisting Chains on the Articulated Bone Pins from Chavín de Huántar (1200 – 500 BCE), Ancash, Peru: Technical Distinctions and Experimentations » (présentiel/in person)

13h55 - 14h15 — **Annelou Van Gijn**
« Bone awls in focus: material interactions in the wetlands of the Rhine-Meuse delta » (Visio/Online)

14h15 -14h30 — **DISCUSSION (15')**

14h30 – 14h50 — Coffee Break (20')

Session 5 –

Hard Animal Material industries, archaeometry and ethics: new advances? / Industrie en MDA archéométrie et éthique : quelles avancées

Chairwomen: Claire LUCAS and Sonia O'CONNOR

14h50 -15h05 — Introduction à la session / Introduction to the session

15h05 - 15h25 — **Aude Chevallier*, Catherine Cretin, Nathalie Fourment & Brad Gravina**
« How to best assess requests for destructive analyses of hard animal materials? Insights from a national museum » (présentiel/in person)

15h25 - 15h45 — **Atilio Francisco Zangrando*, Angélica M. Tivoli, María Paz Martinoli, Marianne Christensen, Lindsey Paskulin, Jay Hilsden, Doris Loewen, Zara Evans & Camilla Speller**
« ZooMS as a tool to explore bone technology production. A case study from Tierra del Fuego (southern South America) » (présentiel/in person)

15h45 - 16h05 — **Justin Bradfield**
« Microwear interpretation in bone tool studies: qualitative vs quantitative methodologies » (Visio/Online)

16h05 - 16h25 — **DISCUSSION (20')**

16h25 – 16h45 —Break (20')

16h45 - 16h50 — **J.-M. Pétillon**
A word of welcome from the SPF / Mot de bienvenu de la SPF

16h50 - 17h35 — Conférence invitée/ Keynote speech

Sonia O'Connor

Raw Materials Identification: developments and limits.

17h35 - Fin de la première journée / End of the first day

DAY 2 / JOUR 2

TUESDAY 14th May — MARDI 14 Mai

Ground floor / Amphithéâtre RDC

8h20 - 8h40 — Welcoming participants / Accueil des participants

Session 4 –
Technical stability and change / Innovation technique et stabilité

Chairmen: Justyna BARON and José-Miguel TEJERO

8h40 - 9h00 — **María Borao*, Joan Emili Aura Tortosa, Ana B. Galán López, Jean-Marc Pétillon & Valentín Villaverde Bonilla**
« Eyed needles in Southwest Europe from the LGM to the Late Glacial: new data » (présentiel/in person)

9h00 - 9h20 — **Natacha Buc*, Alejandro Acosta, Lucía Rombolá & Camilla Speller**
« Technical style on bone arms among late Holocene hunter-gatherers from the low Paraná basin » (présentiel/in person)

9h20 - 9h40 — **Luc Doyon & Isabelle Sidéra***
« Focus on point-shaped artefacts through prehistory. Reflection on their role and place in the use of osseous material » (présentiel/in person)

9h40 - 9h55 — **DISCUSSION (15')**

10h – 10h20 — Coffee Break (20')

10h25 - 10h45 — **Rozalia Christidou*, Zoi Tsirtsoni & Dimitria Malamidou**
« Change and long-term trends in the Northern Aegean Neolithic and Bronze Age osseous industries: An update from Dikili Tash » (présentiel/in person)

10h45 - 11h05 — **Marta Blasco Martín**
« The evolution of hard animal material crafts in a Mediterranean city over 2000 years: Valencia from its bones » (présentiel/in person)

11h05 - 11h25 — **Monica Măgărit**
« Neolithisation of the Lower Danube as reflected by the osseous industry » (Visio/Online)

11h25 - 11h40 — **DISCUSSION (15')**

11h40 - 13h10 — Lunch break (1h30)

Session 6 –
Open session / Thématiques libres

Chairmen: Jean-Marc PÉTILLON & Selena VITEZOVIC

13h10 - 13h30 — **Marcelo Javier Toledo**
« Knapped megafauna teeth and bone from Pampean peri-LGM sites (Argentine) » (présentiel/in person)

13h30 - 13h50 — **Alice Choyke* & Claudia Sabbini***
« Passing the Baton: The Bone Tool Material from Arslantepe Tell in Turkey » (présentiel/in person)

13h50 - 14h10 — **Marie Delassus**
« Bone Carvings in Late Antique Egyptian Furniture: from Standardization to Inventiveness » (présentiel/in person)

14h10 - 14h30 — **María Fernanda Martínez-Polanco* & Cristian Micó**
« Investigating Trapezoidal Plaquettes Crafted from White-tailed Deer Bone at Cerro Juan Díaz (LS-3) Greater Coclé Culture Area, Panama » (présentiel/in person)

14h30 - 14h50 — **DISCUSSION (20')**

14h50 – 15h10 — Coffee Break (20')

15h10 - 15h30 — **Ágnes Font**
« Ivory objects from the Medieval Collection of the Buda Castle Museum, Budapest, Hungary » (présentiel/in person)

15h30 - 15h50 — **Hans Christian Küchelmann**
« Bone, antler and ivory artefacts in the Hanseatic maritime trade » (présentiel/in person)

15h50 - 16h10 — **Jacqui Mulville* & Ian Dennis***
« Heritage, Craft and Communities » (présentiel/in person)

16h10 - 16h30 — **Justyna Baron*, Michał Stasik & Kamil Nowak**
« Impacts of working bone and antler on a bronze knife: Experimental and use-wear studies » (présentiel/in person)

16h30 - 16h50 — **DISCUSSION (20')**

16h50 –17h00 – Short Break (10')

17h00 - 17h20 — **Manuel Altamirano García*, Maria Herrero-Otal, Raquel Piqué Huerta, Antoni Palomo Pérez, Anna Homs, Ruth Maicas, Rafael Ma Martínez Sánchez & Francisco Martínez-Sevilla**
« Approaches to the osseous industry from Cueva de los Murciélagos in Albuñol (Granada, Spain) and its possible relationship with plant-based technologies » (Visio/Online)

17h20 - 17h40 — **Gilberto Perez-Roldán**
« Mesoamerica and Worked bone: Prehispanic human bones » (Visio/Online)

17h40 - 17h50 — **DISCUSSION (10')**

17h50 - Fin de la deuxième journée / End of the second day

19h – 22h : Réception sur la barge du Crous / cocktail dinner on a barge
(uniquement pour les inscrits/ only for subscribers)

DAY 3 / JOUR 3

WEDNESDAY 16th May / MERCREDI 16 Mai

Excursions

• Guided tours of museums according to your registration
Visites guidées des musées selon vos inscriptions faites

(uniquement pour les communicants / only for communicants)

*** Crypte archéologique de l'île de la Cité / du parvis Notre-Dame**
Adresse : 7, Parvis Notre-Dame - Pl. Jean-Paul II, 75004 Paris
Exhibition visit **: In the Seine. Lost and found objects from prehistory to the present day**

*** Musée du Louvre,** Réserves du Département des Antiquités grecques étrusques et romaines et département des Arts de Byzance et des chrétientés en Orient / Department of Greek, Etruscan and Roman Antiquities and Department of Byzantine and Eastern Christian Art
Adresse : Musée du Louvre, 75001 Paris
Visit : **Bone and ivory objects from the Roman, Proto-Byzantine and Umayyad periods**

*** Musée national du Moyen Âge / Musée de Cluny**
Adresse : 28 Rue du Sommerard, 75005 Paris

*** Musée de l'Homme**
Adresse : 17 Pl. du Trocadéro et du 11 Novembre, 75006 Paris

*** Musée d'Archéologie Nationale (MAN)**
Adresse : 1 Pl. Charles de Gaulle, 78100 Saint-Germain-en-Laye (Prendre le RER A, durée du trajet 40 mm)

• 18h30 – 21h00 - Visit to the Musée de la Chasse and after met around a friendly drink
Visite du Musée de la Chasse et verre d'amitié

(uniquement pour les communicants / only for communicants)

DAY 4 / JOUR 4

THURSDAY 16th May / JEUDI 16 Mai

Salle VASARI First floor/1er étage

8h20 - 8h40 — Welcoming participants / Accueil des participants

Session 3 —

From material productions to social structures and cultural traditions / Productions matérielles, structures sociales et traditions culturelles (1)

Chairmen: Marta BLASCO MARTIN et Esteban ÁLVAREZ FERNANDEZ

8h40 - 9h00 — **Jesùs Tapia*, Rodrigo Portero, Marián Cueto, Rosana Cerezo Fernández, Jesùs Jordá Pardo & Esteban Alvarez-Fernández**
« Bone industry in the Upper Paleolithic occupations at El Cierro Cave (Ribadesella, Asturias, Spain) » (présentiel/in person)

9h00 - 9h20 — **Laure Fontana* & François-Xavier Chauvière***
« How can the economy of reindeer antlers document the annual cycle of nomadism of recent Palaeolithic hunter-gatherers? The example of Magdalenian occupations at La Madeleine (South-Western France) » (présentiel/in person)

9h20 - 9h40 — **Bibiana Hromadova* & Laurent Klaric**
« Little things count: examining the size differences of Kostenki-Avdeevo spatulas » (Visio/Online)

9h40 - 9h50 — **DISCUSSION (10')**

9h50 – 10h10 — Coffee Break (20')

10h10 - 10h30 — **Laurent Davin*, Natalie Munro, Anna Belfer-Cohen & Leore Grosman**
« New perspectives on the symbolic use of birds by the primo-sedentary communities of the Levant: Natufian tibiotarsus beads from Hayonim Cave (Western Galilee, Israel) » (présentiel/in person)

10h30 - 10h50 — **Haskel Greenfield* & Tina L. Greenfield**
« "It's the Pits": culturally modified animal bone from an Early Neolithic pit house settlement (Blagotin) in Central Serbia » (présentiel/in person)

10h50 - 11h10 — **Selena Vitezović**
« Aspects of bone manufacturing in the Late Neolithic in eastern Balkans » (présentiel/in person)

11h10 - 11h30 — **Erika Gál* & Anett Osztás**
« A peculiar tool set from two Late Neolithic – Early Copper Age cemeteries in Hungary » (présentiel/in person)

11h30 - 11h45 — **DISCUSSION (15')**

11h45 - 13h15 — Lunch break (1h30)

Session 3 —

From material productions to social structures and cultural traditions / Productions matérielles, structures sociales et traditions culturelles (2)

Chairmen: Alice CHOYKE and Laurent DAVIN

13h15 - 13h35 — **Petar Zidarov* & Rosica Mitkova**
« Is a harpoon just a harpoon? Barbed points and harpoons from Chalcolithic (5th Millennium BC) sites in Upper Thrace, Southern Bulgaria » (présentiel/in person)

13h35 - 13h55 — **Juan A. López-Padilla**
« The luxury of the exotic. Ivory dagger pommels from the Bronze Age Iberian Peninsula » (présentiel/in person)

13h55 - 14h15 — **Vinayak Vinayak**
« Worked Osseous assemblage from Indor Khera, Upper Ganga Plains, India » (présentiel/in person)

14h15 - 14h35 — **Juan Wang**
« A reconsideration of Parrot cups (Yingwu Bei) from ancient Korean Peninsula » (présentiel/in person)

14h35 - 14h50 — **DISCUSSION (15')**

14h50 – 15h10 — Coffee Break (20')

15h10 - 15h30 — **Claire Houmard* & Edouard Masson-Maclean**
« The tradition of caribou scapula scrapers in the Arctic societies » (présentiel/in person)

15h30 - 15h50 — **Henrique Sarmento Pedro**
« The 13th century, a major economic turning point for craftsmen working with animal hard materials » (présentiel/in person)

15h50 - 16h10 — **Ariel Shatil*, Barak Monnickendam-Givon, Ortal Chalaf, Yasmin Szanto & Victor Chernov**
« Currency in Flux and Coins on a Balance: a Bone Tumbrel from Jerusalem and other Medieval Coin Scales » (présentiel/in person)

16h10 - 16h30 — **Paul Stokes**
« Bone Apple Corers Identification, History, Use & Demise » (présentiel/in person)

16h30 - 16h45 — **DISCUSSION (15')**

16h45 - 17h00 — Short Break (15')

17h00 - 17h20 — **Esteban Álvarez Fernández*, Rosana Cerezo Fernández, Alberto Martín-Esquivel, Rodrigo Portero, Santiago Sánchez-De La Parra, Ariadni Ilioglou, Valorie Gô, Oscar González-Cabezas, Alexandre Lefebvre, Marcos Perez-Señaris, Thomas Sagory, Catherine Schwab & Jean-Marc Pétillon**
« Shells revisited: engraved valves from Magdalenian sites in southwest Europe » (présentiel/in person)

17h20 - 17h40 — **Vuk Koldžić**
« Boneworking in the Vinča culture: specialized or not? » (Visio/Online)

17h40 - 18h00 — **DISCUSSION (20')**

18h00 - Fin de la 4e journée / End of the 4th day

DAY 5 / JOUR 5

FRIDAY 17th May — VENDREDI 17 MAI

(Salle VASARI First floor / 1er étage)

8h30 - 9h00 — Welcoming participants / Accueil des participants

Session 7:
Master and doctoral students forum / Tribune des Masters et doctorants (1)

Chairmen: Gabriela BRAVO, Natacha CAURETTE, Constantinos CHONDROS

9h00 - 9h15 — **Margot Damery* & Claire Houmard**
« Splitting and/or grooving after the Late Glacial Maximum in Western Europe, between continuity and innovation? » (présentiel/in person)

9h15 - 9h30 — **Rosana Cerezo Fernández*, Jean-Marc Pétillon & Esteban Alvarez-Fernández**
« Antler technology in the Cantabrian Magdalenian (17-14 Ka cal BP): the cases of Tito Bustillo (Asturias), Cova Rosa (Asturias) and the Lower Gallery of La Garma (Cantabria) » (présentiel/in person)

9h30 - 9h45 — **Marie-Pauline Vignes*, Fabrice Bray, Veerle Rots, Claire Houmard, Patrick Auguste, & Marie-Anne Julien**
« Contributions of paleoproteomics to the study of Middle Paleolithic bone tools: the Biache-Saint-Vaast "retouchers" (MIS 7, Pas-de-Calais) » (présentiel/in person)

9h45 - 10h00 — **Emma Bernard*, Laurence Bourguignon, Sandrine Costamagno, Emmanuel Discamps, Jean-Philippe Faivre, Alexandra Legrand-Pineau & Elise Tartar**
« Enigmatic removal scars on bone fragments from Middle Paleolithic layers at Combe-Grenal (Dordogne, France): an experimental approach » (présentiel/in person)

10h00 - 10h15 — **DISCUSSION (15')**

10h15 – 10h35 — Coffee Break (20')

Chairwomen: Gabriela BRAVO and Natacha CAURETTE

10h35 - 10h50 — **Constantinos Chondros**
« A fresh look at the Thessalian Neolithic osseous tools: the study from Mandra (Northern Greece, 5th millennium cal BC) » (présentiel/in person)

10h50 - 11h05 — **Eleni Koutsopoulou**
« The Neolithic Bone Industry from Early Neolithic to Final Neolithic: the study from Paliambela Kolindros in the region of Pieria, Northern Greece (6000 - 4700/4500 cal BC) » (présentiel/in person)

11h05 - 11h20 — **Quentin Zarka**
« The boar's tusk helmets, study of the manufacturing process based on the case of Aegina » (présentiel/in person)

11h20 - 11h35 — **Xenia Pop**
« The story of the hunter's quiver from the Eneolithic site of Urziceni-Vamă (Romania) » (présentiel/in person)

11h35 - 11h50 — **DISCUSSION (15')**

11h50 – 13h30 — Lunch break (1h40)

Session 7:
Master and doctoral students forum / Tribune des Masters et doctorants (2)

Chairmen: Gabriela BRAVO and Constantinos CHONDROS

13h30 - 13h45 — **Carla Giuliani*, Laurine Dumont, Anne-Marie Moigne & Pierre Magniez**
« Crafting the Past: Exploring Diversity in Lower Paleolithic Bone Retouchers at La Caune de l'Arago (Tautavel, France) during MIS 13 » (présentiel/in person)

13h45 - 14h00 — **Liteboho Senyane**
« An assessment of whether saturated sediment ablation on stationery bone can mimic bone tool use-wear from Earlier Stone Age contexts » (présentiel/in person)

14h00 - 14h15 — **Natacha Caurette**
« Interaction and complementarity of bone tools and flint tools in hide-working activities: the example of the Late Solutrean of Combe Saunière 1 (Dordogne, France) » (présentiel/in person)

14h15 - 14h30 — **DISCUSSION (15')**

14h30 – 14h50 — Coffee Break (20')

Chairmen: Natacha CAURETTE and Constantinos CHONDROS

14h50 - 15h05 — **Gabriela Bravo**
« Bone technology of archaic hunters and gatherers from the northern and central coasts of the North Semi-Arid region of Chile » (présentiel/in person)

15h05 - 15h20 — **Solenn Rondet-Correc**
« Preliminary study of the Thule bone industry in Northwest Alaska: Rising Whale Site, Cape Espenberg » (présentiel/in person)

15h20 - 15h35 — **Paulina Maruszak**
« T-shape antler axes of the North European plain: technological approach » (présentiel/in person)

15h35 - 15h50 — **DISCUSSION (15')**

15h50-16h10 — Break (20')

Session 8 (1) — Flash communications

Chairwomen: Marianne CHRISTENSEN and Nejma GOUTAS

16h10 - 16h22 — **Jean-Marc Petillon*, Elise Tartar, Laura van der Sluis, Krista McGrath, Lucía Agudo Pérez, Leire Torres-Iglesias, Ana B. Marín-Arroyo, Christian Normand, Camilla Speller, Antoine Zazzo, Alexandre Lefebvre**
« The elephant in the room: the use of mammoth bones for the manufacture of objects in the Upper Paleolithic of Southwest France » (présentiel/in person)

16h22 - 16h34 — **María Isabel Borao Alvarez*, Sylvain Ducasse & Jean-Marc Pétillon**
« Placard-type points reloaded: definition, distribution and chronology of a classic index fossil » (présentiel/in person)

16h34 - 16h46 — **Merel Spithoven-Stikkelorum**
« Preliminary results of carrying and shooting experimental Doggerland barbed points » (présentiel/in person)

16h46 - 16h58 — **Miriam Luciañez Triviño* & Violeta Moreno Megías**
« Technological choices and identities in funerary contexts during the Phoenician-Punic period: ostrich eggs from Villaricos (Almería) » (visio/online)

Session 8 (2) — Posters session / Présentation des posters

17h05 - 18h05 — **Session d'échange entre les auteurs des posters et le public**

1. **Daniele Aureli*, Roxane Rocca* & Pierre Magniez**
« Bone tools 600.000 years ago in Europe? What method for a correct diagnosis of the presumed bone small tools at the Lower Paleolithic site of Cimitero di Atella (Italy) »
2. **Natacha Buc*, A. Acosta, L.T. Rombolá & D. Loponte**
« Small tools on animal raw material. Hunter-gatherer assemblage from the Low Paraná wetland »
3. **Martina Galetova Laznickova**
« Relation of humans and beasts of prey in the Moravian Gravettian: the example of processing of Carnivors bones at Predmosti I – decorated awls »
4. **Cynthia Kromotaroeno**
« The story of needles and pins: what they tell us about Dorestad. An experimental journey »
5. **Laura Tordeur Champagne**
« Red deer antler tools found in an Early Bronze Age tomb: a new discovery in Valais, Switzerland »
6. **Asta Salicath Halvorsen**
« Use-wear of worked bone objects from the Late Epipalaeolithic and Early Neolithic Levant to elucidate perishable material culture »
7. **Chong Yu**
« Bone weaving implements from Final Neolithic to Late Bronze Age China »
8. **Selena Vitezović*, Nemanja Marković & Ivan Vranić**
« Artefact from bird bone from the Late Iron Age site of Kale – Krševica (southern Serbia) »

18h05 – 18h45 :
Discussions sur le prochain WBRG Meeting en 2026 et Clôture du colloque / Discussions on the next WBRG Meeting in 2026 and Closure of the conference

Scientific programme

Abstracts

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Programme scientifique

Résumés

JOUR 1/ DAY 1

MONDAY 13th May — LUNDI 13 Mai

Amphithéâtre RDC / ground floor

Session 1:
Appropriate experimental procedures / Du bon usage de la démarche expérimentale

In the last few years, the term "experimentation" has taken on a very broad meaning in research connected with hard animal material (HAM) industries, and more generally, in the general exploitation of animal resources. Based on archaeological case studies and/or examples drawn from the history of our disciplin, this thematic session aims to engage a collective brainstorming to better define the meaning given to specific terms and concepts. From didactic tests (often exploratory) to large-scale experimental programs, is it possible to create and define a typology of different experimental approaches? What are their objectives, their contribution, but also their limits? Examples of unexpected or problematic results are especially welcome since failures and mistakes are also a learning experience. The rich diversity of the WBRG meeting participants offers a framework for valuable comparisons of practices in different countries, on material from various chronological periods and various kinds of animal resources. This thematic session aims at contributing to increased consensus over what constitutes proper experimental practice and terminology. This session could contribute to a greater homogenization of our practices and terminologies, and help us to better establish our research questions in relation to the resources we mobilize to answer them, and vice versa. In addition to these issues, this session is open to all presentations dealing with the experimental approach to understanding hard animal material processing and transformation chains (*chaînes opératoires*), or the use of equipment manufactured from these materials.

Constatant que le terme « expérimentation » a pris un sens très étendu dans les travaux sur les industries en matières dures d'origine animale (MDA) et plus largement sur l'exploitation des ressources animales, cette session a pour objectif d'engager des réflexions collectives pour mieux définir le sens que nous donnons à certains termes ou concepts, à partir d'études de cas archéologiques et/ou d'exemples tirés de l'histoire de notre champ disciplinaire. Des tests didactiques, souvent exploratoires, aux programmes expérimentaux de grande ampleur, pouvons-nous définir une typologie de différentes démarches expérimentales ? De leurs objectifs, intérêts, mais aussi de leurs limites ? Les exemples d'expérimentation qui ne valident pas l'hypothèse de départ sont ainsi les bienvenus, car des échecs ou erreurs, on peut tirer beaucoup d'enseignement. Le WBRG, par la diversité et la richesse des participants qu'il agrège, offre un cadre de confrontations précieux des pratiques selon les pays, les périodes chronologiques, voire les ressources animales étudiées. Cette session pourrait contribuer à une plus grande homogénéisation de nos pratiques et de nos terminologies, et nous aider à mieux assoir nos questionnements scientifiques en regard des moyens que nous mobilisons pour y répondre et …inversement. Au-delà de cette problématique, cette session est ouverte à toutes les présentations traitant de l'approche expérimentale en lien avec la compréhension des chaînes opératoires de traitement et de transformation des MDA ou d'utilisation des équipements fabriqués à partir de ces matières.

Session 2:
The study of material interactions: implementation and interpretation
Interactions entre matériaux : application et interprétation

This session will be devoted to research that takes a crossover approach to technical systems, by linking several materials (bone/lithic, bone/ceramic, bone/metal, bone/shell, bone/vegetal), in order to move away from our usual one "material" study. The session aims to better understand how the exploitation of one animal resource, regardless of its origin, condition the acquisition, transformation or use of another resource, and conversely?

Cette session sera consacrée aux travaux s'inscrivant dans une approche croisée des systèmes techniques, en mettant en relation plusieurs matériaux (os/ lithique, os/céramique, os/métal, os/coquille, os/végétal), afin de nous décentrer de nos matériaux d'étude habituels. Il s'agira de mieux comprendre comment l'exploitation des matières dures d'origine animale s'articule avec les autres composantes de la culture matérielle. Comment par exemple l'exploitation d'une ressource animale – quelle que soit son origine – conditionne l'acquisition, la transformation ou l'utilisation d'une autre ressource et inversement ?

10h10 - 10h30 — **Christian Gates Saint-Pierre*[1] & Jessica Labonté[1]**
« Of Beaver Teeth and Humain Hair: A Tale of Two Experiments in Bone Usewear » (présentiel/in person)

[1]Université de Montréal

Beaver incisors found at prehistoric sites are often interpreted as woodworking tools such as chisels or scrapers. However, this common assumption has never been clearly demonstrated. The first half of this paper presents for the first time a detailed usewear analysis aimed at experimentally testing this hypothesis. In the second half, another usewear experimentation describes the characteristic microtraces of bone objects used as hairpins, which may often be confused with bone awls. Together these results highlight the need for caution in attributing functions to prehistoric bone tools in the absence of solid analyses.

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10h30 - 10h50 — **Thaís Pansani*[1], Briana Pobiner[1], Agueda Vialou[2], Loic Bertrand[3] & Mírian Pacheco[4]**
« Giant sloth bone ornaments from the Last Glacial Maximum of Brazil: what do we know and what else can we ask? » (présentiel/in person)

[1]Smithsonian's National Museum of Natural History – États-Unis
[2]Muséum National d'Histoire Naturelle (MNHN) – France
[3]ENS Paris-Saclay, PPSM – France
[4]Universidade Federal de São Carlos campus Sorocaba – Brésil

The Santa Elina rock shelter in Central Brazil is a pivotal archaeological site in the Americas with evidence of human occupation and possible human interaction with Pleistocene megafauna before the Last Glacial Maximum (LMG). Remains of an extinct giant ground sloth (Glossotherium phoenesis (2)) were found associated with evidence of material culture, such as stone tools, flakes, and mineral pigments, from two layers dated to 13 000 and 27 000 years B.P. (1). In the oldest (LGM) layer, three perforated osteoderms (i.e., dermal bones) of the giant sloth were found. These perforated osteoderms were studied by Pansani et al., (3), who demonstrated their anthropogenic modification, including demonstrated human-induced hole perforations, stone tool marks, including incision marks, scrape marks, and notches, as well as superficial use-wear traces, attachment systems, and deformation of these bones. Some hole perforations were interpreted as the result of intensive use as ornaments. Experimental approaches and the implementation of state-of-the-art methodologies confirmed that these modifications happened before the burial of the archaeological and paleontological assemblages at 27 000 years B.P., providing evidence of human presence and symbolic behavior during the Ice Age in Brazil. While further taphonomic studies of the fossil bone assemblage of Santa Elina are ongoing, some questions about these bone artifacts remain. First, can we investigate the function of these artifacts and categorize them into a specific category of bone ornament, such as pendants? If so, what kind of evidence should we look for in this investigation? Second, is it possible to extract ancient human DNA from these artifacts, considering they were found in a tropical environment in which the fossil bone assemblage is not well preserved due to weathering, and the likelihood of modern human DNA contamination of the objects since their discovery and handling in the 1990s? Third, because the Paleolithic bone industry is rare in the Americas, is a detailed comparison between these bone ornaments and bone ornament assemblages from other continents a valid approach? Fourth, can further experimental studies provide more secure interpretations regarding the production and function of these ornaments? Finally, is it possible to infer a continuous cultural tradition of the inhabitants of the Santa Elina rock shelter based on the presence of giant sloth bone ornaments from the Pleistocene and other bone and shell ornaments from the Holocene (4)? The evidence of LGM bone artifacts in Santa Elina indicates the presence of humans in the Americans at least 10 000 years before the more traditionally accepted dates for peopling of this continent, and also highlights human interaction with bones of large mammals (giant ground sloths) for non-subsistence purposes, which warrants future investigation.

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10h50 - 11h10 — **Nélida Marcela Pal[1], Víctor Vargas Filgueira[2], Jorge Guillermo Ortiz[1], Oriana Hernandez Herrero[1] & Angélica M. Tivoli*[1]**

« Microwear analysis on bone pointed artefacts: An experimental approach » (présentiel/in person)

[1]CADIC-CONICET (Centro Austral de Investigaciones Científicas - Consejo Nacional de Investigaciones Científicas y Técnicas), Ushuaia – Argentine
[2]Museo del Fin del Mundo, Ushuaia – Argentine

Native people in the southern coast of Tierra del Fuego extensively used bone for technological purposes for at least 7000 years cal. BP. Pointed artefacts were abundant in the regional archaeological record, produced on guanaco (Camelidae) and bird bones, being the last, the most abundant in the whole sequence. In the literature, they have been mainly referred as “awls” or as “points” by some authors (1) (2). Archaeological studies indicate that selection of taxa and anatomical portions of birds for making these instruments was stable during the entire sequence of this region (3). In the case of guanaco points, they are mainly manufactured on the metapodials and are found in assemblages along the Holocene, but more frequent in the late Holocene (4) (5). Ethnographic information indicates different possible tasks for this technology, used for the production of basketry, and the work of leather and bark (6). There are also previous microwear analysis regarding the use of pointed artefacts on bird bones for the Magellanic-Fuegian area, recording their use on material of both vegetal and animal origin (7) (8). Hide piercing was also identified on guanaco points through this method (5).
In this communication, we present the results of an experimental study from which we explore potential differences in the formation process of manufacture and use traces of pointed artefacts made on guanaco and bird bones. Replicas of these two taxa has been done: bird bones (n=20) and guanaco bones (n=15). Considering background information from archaeological and ethnographical records, we use different anatomical parts in the case of birds (e.g., humerus, tibiotarsus, ulna and radius), while metapodials were selected in the case of guanaco. The authors worked different materials with the replicas: bark (fresh and dry), skin (fresh and dry) and fresh rush (Marsippospermum grandiflorum). In the case of rush work, we take advantage of the ancestral knowledge of one of the authors, a Yagan artisan.
Microwear analysis was done in two steps using binocular and metallographic microscope. First, we analyze the traces of technological production after the manufacture of the replicas; and second, the traces of use after work with different materials. Therefore, this paper intends to expand the framework of manufacture and use wear traces on these bone supports. Finally, the implications of the results for archaeological assemblages are discussed, considering potential interpretations in the production and use of this bone technology in the past.

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11h10 - 11h30 — **Miriam Luciañez Triviño[1] & Corina Liesau Von Lettow-Vorbeck*[2]**
« Ivory “segmentation” procedures with copper-based tools. Archaeological and experimental evidence » (visio/online and présentiel/in person)

[1]Departamento de Prehistoria y Arqueología, Universidad de Sevilla – Espagne
[2]Departamento de Prehistoria y Arqueología, Universidad Autónoma de Madrid – Espagne

Since the end of the 19th century, scholars have confirmed the presence of proboscidean ivory in Iberian sites from the Late Neolithic to the Iron Age. There is still a great deal of interest reflected in an extensive bibliography related to the study of this raw material throughout the Mediterranean and the taxonomical origin of several dentins traditionally identified as “ivories”. However, except for Palaeolithic research, little research has been carried out on the production and technology of ivory objects and the experimental approach, is generally scarce. The use of metal tools (e.g. chisels, saws and awls) to perform different operations in the processing of elephant tusks has been suggested by the technical study of several peninsular ivory assemblages. We present the results obtained from the experimentation carried out with five copper-based tools and we have focused on its use for the transverse division of the tusk. The tools used are replicas of archaeological models from the Copper and Bronze Ages in the Iberian Peninsula and Europe. For segmentation by sawing, we used two pure copper saws -one with a forged blade-, one saw with arsenic copper (2% As, 98% Cu) and one bronze saw (90% Cu, 10% Sn). For segmentation by cutting percussion, we used a bronze axe.
We describe the stigmata observed experimentally and discuss the effectiveness or ineffectiveness of these tools. We will also discuss whether the experiments confirm the initial hypotheses. From our experience, we can state that some small copper-based saws from the Chalcolithic would not be useful for segmenting large thicknesses of ivory (e.g. complete tusks), although they could have been used to saw smaller pieces, such as the tips of these tusks, ivory discs or smaller fragments of material, that could be transformed as personal adornments (beads, buttons, pins etc.) in local workshops, according to the demand of the social or religious elites. A consequence of this technical limitation was the search for more efficient methods, such as the use of ‘abrasive sawing’. Bronze Age model saws did prove to be more efficient. Experimentation with bronze axe percussion has been more problematic in its interpretation, not only because of the scarce archaeological evidence, but also because of the discrepancy among specialists about its use for working exotic, high-value raw materials such as ivory. The difficulty of using an axe to segment an elephant tusk without wasting material raises questions about its use, but we still know little about the technical knowledge and skills of Copper and Bronze Age ivory artisans. Otherwise, we will briefly consider whether ‘segmentation’ is an appropriate technical term in the Spanish language, because of its use in social terms and, in particular, its use in relation to recent prehistoric societies that use ’ditched enclosures’.

11h30 - 11h50 — **DISCUSSION (20’)**

AFTERNOON

Session 1: Appropriate experimental procedures / Du bon usage de la démarche expérimentale
Session 2: material interactions /Interactions entre matériaux

13h15 - 13h35 — **Hildegard Müller*[1], Dorota Wojtczak[1], Nicole Reynaud Savio*[2] & Aurélie Schenk*[2]**
« Sledge runner or tool? Experimental and micro-wear approaches in the study of Roman and Iron Age bones from Avenches, Switzerland » (présentiel/in person)

[1]University of Basel – Suisse
[2]Site et Musée romains d’Avenches – Suisse

Avenches/Aventicum was an important place during the Iron Age and Roman times. First as a large Celtic settlement and later as a Colonia. During archaeozoological analyses, a large number of well-preserved bones with polished, striated, and abraded areas were detected. The majority of them represent bovine mandibles, alongside a few other long bones. Due to historical pictorial evidence or ethnological sources, such transformed skeletal elements are often referred to as skates or sledge-runners in the literature. However, such bone tools could also be used in diverse artisanal activities.
The artefacts from Avenches come mainly from a mid-1st century BC site situated next to a paleochannel with several pits linked together by canals. These structures might have been used for artisanal purposes, such as retting or hideworking. Additional finds, like a hackle brush, support this interpretation.

The experimental and the use-wear approaches were undertaken to propose the possible function of these artefacts. Several crafts were undertaken during the experiments: horn, flax, and hide processing. Furthermore, experiments with sledge runners on grass, ice, and snow were performed. The experimental work and functional analysis are still on-going, but the traces formed during diverse experiments are distinct, thus promising for further analyses.

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13h35 - 13h55 — **Mélanie Ferras**[1,2]
« Flat and Twisting Chains on the Articulated Bone Pins from Chavín de Huántar (1200 – 500 BCE), Ancash, Peru: Technical Distinctions and Experimentations » (présentiel/in person)

[1]Lettres Sorbonne Université, CeRAP – France
[2]Université catholique de Lille - Faculté des lettres et sciences humaines – France

The archaeological excavations conducted at the Formative Andean ceremonial center of Chavín de Huántar (1200-500 BCE), Ancash, Peru, by the Chavín de Huántar Archaeological Research and Conservation Program, led to the discovery of a group of articulated and sculpted bone pins. This set of manufactured objects, which includes approximately 87 pieces, is exceptional and, at the current stage of investigations, unique for the Formative period (1800 – 200 BCE) in the Central Andes. The pins display a superior technical ability, as each is made from a single piece of bone that has been cut to the desired form composed of three articulated sections: a long, thin needle articulated with a chain of one, two, or three links, itself hinged with a distal part with a motive shape. The singularity of these objects can be appreciated with their complex articulation system made with interlocking links, which represents a true technical challenge. The study of the artifacts allows us to identify two categories of links that create technically different chains and divide the corpus into two main technical subgroups: flat chains and twisting chains. The experimentation strives to study the shaping processes and the production of the chains. This communication focuses on these two articulation systems, using both analytical and experimental data, to underline the technical distinctions within the group of articulated bone pins from Chavín de Huántar.

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13h55 - 14h15 — **Annelou Van Gijn**[1]
« Bone awls in focus: material interactions in the wetlands of the Rhine-Meuse delta » (Visio/Online)

[1]Leiden University (UL), Faculty of Archaeology – Pays-Bas

Several late Mesolithic and Neolithic sites have been excavated in the Rhine-Meuse delta of the western Netherlands, many of which have excellent bone tool preservation. Detailed microwear analysis of not only the bone and antler tools, but also of flaked and ground stone tools performed for these sites, showed a network of material interactions, leading to the identification of tookits for various craft activities. In this paper I will focus on bone awls, and how the various stages of their biographies are situated in a network of tools and materials related to several craft activities. Many are made on red deer metapodia, a tradition that lasts millennia and is related to the significance of this animal for Stone Age people in this area. Microwear analysis of the bone awls has revealed that they were used on different materials like skin and various types of plants. Comparison with experimentally used tools allowed us to even draw more detailed inferences like the type of basketry making they were most likely involved in. Bone awls in focus thus provides a detailed picture of domestic life in the later Stone Age, a picture that could only be obtained through a detailed technological and microwear analysis.

14h15 - 14h30 — **DISCUSSION (10')**

14h30 – 14h50— Coffee Break (20')

Session 5: Hard Animal Material industries, archaeometry and ethics: new advances? / Industrie en MDA archéométrie et éthique : quelles avancées ?

Archaeometric methods applied to hard animal materials (HAM) have made great strides over the last ten years. This session will provide an opportunity to take stock of these new approaches (invasive vs. non-invasive methods) and the real contribution of the analyses carried out (scientific together with their financial cost-benefit ratio). Following the example of the collective work undertaken for human remains from archaeological contexts, it is hoped that this session will initiate the development of an international ethical charter, under the umbrella of the WBRG, for a better (scientific and patrimonial) management of HAM industries, in order to avoid their destruction and the irreversible loss of information.

Les méthodes en archéométrie appliquées au MDA ont fait de grandes avancées ces 10 dernières années. Cette session doit permettre de faire le point sur ces nouvelles approches (méthodes invasives vs non invasives) et les apports réels des analyses effectuées (rapport gain-coût scientifique et financier). À l'image des réflexions collectives engagées pour les restes humains issus de contextes archéologiques, cette session pourrait notamment permettre d'initier une charte éthique internationale, sous le label du WBRG, pour une meilleure gestion (scientifique et patrimoniale) des analyses invasives/destructrices appliquées aux industries en MDA, afin d'éviter leur destruction ou la perte irréversible d'informations.

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14h50 - 15h05 — Introduction to the session / Introduction à la session

15h05 - 15h25 — **Aude Chevallier*[1, 2], Catherine Cretin[3, 4], Nathalie Fourment[3, 4] & Brad Gravina[3, 4]**
« How to best assess requests for destructive analyses of hard animal materials? Insights from a national museum » (présentiel/in person)

[1]Musée national de Préhistoire – Ministère de la Culture et de la Communication – France
[2]UMR 8068 TEMPS Technologie et Ethnologie des Mondes Préhistoriques, CNRS – France
[3]Musée national de Préhistoire – Ministère de la Culture et de la Communication – France
[4]CNRS (De la Préhistoire à l'Actuel : Culture, Environnement et Anthropologie), Univ. de Bordeaux – France

The florescence of archeometric techniques for analyzing hard animal material (bone, teeth, ivory, antler and shell) over the last decade has led to an increase in requests for destructive and semi-destructive sampling of objects in the Musée national de Préhistoire's (MNP) collections. Often concerning rare if not unique artefacts, these requests pose the question as to how best fulfill the museum's joint mission to conserve archaeological heritage and foster a better understanding of its collections. In order to best respond to this dual objective, the MNP created a "destructive analysis committee" in 2018 to examine the different requests internally and, when necessary, with help from an external expert. This has naturally led to significant review of how to set and assess decision-making criteria. With some forty sampling requests arbitrated over the last 5 years, here we attempt an assessment of how best to treat requests for the destructive analyses of hard animal materials.

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15h25 - 15h45 — **Atilio Francisco Zangrando*[1], Angélica M. Tivoli*[1], María Paz Martinoli[1], Marianne Christensen[2], Lindsey Paskulin[3], Jay Hilsden[3], Doris Loewen[3], Zara Evans[3] & Camilla Speller[3]**
« ZooMS as a tool to explore bone technology production. A case study from Tierra del Fuego (southern South America) » (présentiel/in person)

[1]CADIC-CONICET (Centro Austral de Investigaciones Científicas - Consejo Nacional de Investigaciones Científicas y Técnicas), Ushuaia – Argentine
[2]Université Paris 1 Panthéon Sorbonne, UMR 8068 TEMPS – France
[3]Department of Anthropology, University of British Columbia, Vancouver – Canada

As in many coastal societies around the world, cetaceans were crucial resources for subsistence and technological production for hunter-gatherer-fishers in Tierra del Fuego (southern South America). Both archaeological and ethnohistorical data support the importance of whales from 7000 cal BP to postcontact times for the production of bone technology (1). Identifying the taxonomy of cetaceans in the archaeological record is key to understanding the diverse relations between humans and whales through human history. Our knowledge about the past use of specific cetacean species, however, is quite scarce. This is mainly because of the fragmentary condition of whalebones in the archaeological record, and the limitations of identifying taxa based on the visual inspections of tools.

A molecular method using mass spectrometry (ZooMS) was recently developed to face these analytical limitations in cetacean bones. This technique provides accurate taxonomic identification for cetaceans from minimal sampling on bones or artefacts (2) (3). ZooMS was successfully applied to identify and discuss the use of bones from terrestrial mammals by analyzing artifacts (finished products) (e.g., (4) (5)). However, in coastal sites, such as in Tierra del Fuego, the production of bone technology can generate highly variable numerical quantities of products and byproducts, which can distort the quantification of the species of cetaceans used. Therefore, the identification of species should not only consider finished products or tools, but also debris generated from their production.

Here, we present and discuss the results obtained by ZooMS in the identification of raw material (taxonomic) selection exploring different stages in the bone technology production on cetacean bones from an archaeological locality in Tierra del Fuego. The analyzed samples come from three shell middens of the Heshkaia archaeological locality, on the eastern coast of the Beagle Channel (Argentina). The occupations recorded in these assemblages correspond to the late Holocene, with ages between 600 and 245 cal BP. ZooMS analyses were conducted on 55 samples with no signs of combustion. These samples include tools (e.g., wedges), technological byproducts (e.g., waste products), anatomically identified bones with cultural modifications, as well as other bone remnants with no signs of modification.

DNA analysis was attempted to confirm the species identification for 9 samples. A high percentage of the sample (87%) could be taxonomically identified to genus/species, while 11% could be taxonomically identified to family and 1 sample could not be identified. Among the identified samples (n= 54), 56% were identified as humpback whales (*Megaptera novaeangliae*), 20% were identified as sei whales (*Balaenoptera borealis*), 9 % were identified as blue whales (*Balaenoptera musculus*), 6% were identified as right whales (*Eubalaena* sp.), 6% were identified as 'beaked whales' (Ziphiidae), and 2 were identified as South American camelids (Camelidae). DNA analysis confirmed the ZooMS identifications, identifying the beaked whales as Cuvier's beaked whale (*Ziphius cavirostris*).

Results show that humpback whale, sei whale and blue whale were used as a source of raw materials for the production of technology. The humpback whale is the ubiquitous species in the archaeological locality, since this taxon presents the greater frequency and it was identified in finished products (tools), in byproducts and in larger bones with cultural modifications. Other species, such as Cuvier's beaked whale, cannot be related to technological production and their presence in the archaeological record appears to be linked to subsistence activities and bone blubber/oil extraction.

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15h45 - 16h05 — **Justin Bradfield**[1]
« Microwear interpretation in bone tool studies: qualitative vs quantitative methodologies » (Visio/Online)

[1]Palaeo-Research Institute, University of Johannesburg – South Africa

For some, use-wear analysis is a bit of an esoteric art that entails looking at magnified images of topographic features, polished surfaces and micro-striations in an attempt to work out what a tool was used for in the past. There have been many critiques of the subjectivity inherent in these interpretations. More recently, archaeologists have started to employ areal surface roughness parameters to quantify microwear features. These roughness parameters, derived from 3D scanning confocal microscopy, are often touted as a more objective and repeatable measure of changes in surface topography caused by use. In this paper I contrast these two techniques (the qualitative and the quantitative) and assess the relative merits and applications of both.

16h05 - 16h25 — **DISCUSSION (20')**

16h25 – 16h45 — Short Break (20')

16h45 - 16h50 — **J.-M. Pétillon**
A word of welcome from the SPF :/ Mot de bienvenu de la SPF

16h50 - 17h35: Conférence invitée/ Keynote speech

Sonia O'Connor
Raw Materials Identification: developments and limits.

17h35 - End of the 1st day / Fin de la 1ère journée

JOUR 2/DAY 2

TUESDAY 14th May — MARDI 14 Mai

(Amphithéâtre RDC/ ground floor)

Session 4: Technical stability and change / Innovation technique et stabilité

Historically, technical innovations have been used to illustrate past technical or conceptual breakthroughs considered relevant for defining or clarifying the major chrono-cultural phases of Prehistory. Phases of stability within technical systems, as well as the rejection of innovation (their social implications and the reasons for acceptance or rejection) still seem to be rarely discussed in concrete terms, undoubtedly because these aspects are difficult to pinpoint.
What does it mean when a group of people rejects or ignores a potential technical (or even symbolic) innovation? Does this choice reflect a voluntary/hostile distancing from novelty (rejection of knowledge that comes from a perceived "other" or strict adherence to community standards)? A such constrained distancing (e.g., inability to integrate and perpetuate innovation) due to lack of know-how or restricted access to certain raw materials, etc.? Can researchers distinguish between rejection and "non-knowledge" of an innovation in the archaeological record?
On the other hand, technical stability can reflect social, economic and/or environmental stability, but it can also conceal the opposite when we consider all the whole material and ideal culture, including other technical systems (lithic, ceramic etc.). How could these technical arrhythmias be interpreted? Why does one system change and not another?

Les innovations techniques ont historiquement servi à illustrer des ruptures techniques, conceptuelles considérées comme pertinentes pour définir ou éclairer les grands phasages chrono-culturels des Préhistoriens. Les phases de stabilités au sein des systèmes techniques ainsi que le rejet de l'innovation (leurs implications et le pourquoi), sans doute parce qu'ils sont plus difficiles à mettre en évidence, semblent encore rarement discutées concrètement.
Que signifie nier ou ignorer une innovation technique (ou même symbolique) ? Cela traduit-il une mise à distance volontaire/hostile de la nouveauté (refus de ce qui vient de l'étranger ou un strict respect des normes du groupe) ? Une mise à distance contrainte (ex. : impossibilité d'intégrer et de pérenniser l'innovation par manque de maitrise d'un savoir-faire ou un accès restreint à certains matériaux, etc.) ? Et pouvons-nous distinguer le refus de la non-connaissance d'une innovation dans le registre archéologique ?
Concernant la stabilité technique, si elle peut faire écho à une stabilité sociale, économique et/ou environnementale, elle peut aussi cacher le contraire dès lors que l'on considère l'ensemble de la culture matérielle et idéelle, et donc les autres systèmes techniques (lithique, céramique, etc.). Comment interpréter ces arythmies techniques ? Pourquoi un système change-t-il et pas un autre ?

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8h40 - 9h00 — **María Borao*[1], Joan Emili Aura Tortosa[2], Ana B. Galán López[1], Jean-Marc Pétillon[1] & Valentín Villaverde Bonilla[2]**
« Eyed needles in Southwest Europe from the LGM to the Late Glacial: new data » (présentiel/in person)

[1]CNRS UMR 5608 TRACES, Université Toulouse Jean Jaurès – France
[2]Universitat de València – Espagne

The precise timing of the appearance of eyed needles in Southwest Europe (Solutrean, or later periods?) is still debated. The problem is made more complex by the fact that the distribution and representativeness of eyed needles vary, depending not only on the more or less intensive production of these objects but also on preservation hazards and on the excavation methodology employed. The possible existence of stratigraphic alterations which were not detected and the fact that fine screening was usually not used in old excavations mean that small pieces like needles, and fragments thereof, are often underrepresented or deprived of reliable context. In this work, we present the study of needles recovered from six archaeological sites in Southwest Europe including Cuzoul de Vers, Abri Fritsch and Abri Lachaud in France, and Cova del Parpalló, Cova de les Cendres and Hort de Cortés-

Volcán del Faro on the east coast of Spain. The studied assemblages come from layers attributed to the Solutrean, Badegoulian and Magdalenian, so we can infer different questions: 1. The reality of the existence of needles during the Solutrean period; 2. The variability of morphology and metrics approached through a compared statistical analysis in each site and period; 3. The different operational schemes employed, how the raw material is acquired and what techniques and procedures are used in its transformation into a needle; 4. The use-wear traces, breakage patterns and techniques employed to reutilize the tool; and 5. The representation of this tool in the assemblages along the different cultural periods. With all this information we evaluate the technological diversity of this tool type across time and space.

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9h00 - 9h20 — **Natacha Buc*[1], Alejandro Acosta[2], Lucía Rombolá[2] & Camilla Speller[3]**
« Technical style on bone arms among late Holocene hunter-gatherers from the low Paraná basin » (présentiel/in person)

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[2]Instituto Nacional de Antropología y Pensamiento Latinoamericano, CONICET - Argentine
[3]University of British Columbia - Canada

Bone tools used by late Holocene hunter-gatherers in the low Paraná basin are primarily represented by harpoon heads, drilled points, stemmed points, and spearthrowers. There is material variability among archaeological sites, suggesting the existence of different archaeological units that can be explained by the development of human activity in the area, which increased around 1100 years BP.
In this study, we aim to explore differences in both external and internal features of the tool assemblage in the Low Paraná basin to trace technological innovations linked to social segregation. As a result, we note that structural variables, such as raw material selection or manufacturing techniques, do not show differences among the archaeological units, while decoration and morphology do vary. Stability in internal features suggests the existence of shared and long-term technological knowledge, while variation in superficial and visible features reflects recent innovations in the archaeological time span.

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9h20 - 9h40— **Luc Doyon[1] & Isabelle Sidéra*[2]**
« Focus on point-shaped artefacts through prehistory. Reflection on their role and place in the use of osseous material » (présentiel/in person)

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[2]CNRS UMR 5607 Ausonius, Institut de recherche sur l'Antiquité et le Moyen âge, Univ. Bordeaux Montaigne – France

Point-shaped artefacts, here understood in its general term from blunt or tapered to pointy tip, is one of the most recurring features in osseous technology, irrespective of the time or region in Prehistory (Camps-Fabrer dir. 1990). The earliest evidence of bone tools consists of expedient instruments with blunt tapered tips; selected from bone accumulations naturally occurring in the environment, these items were used without prior modifications as sticks to dig into termite mounds (Backwell, d'Errico, 2001). Conversely, objects presenting entirely shaped pointy distal end, some of which were hafted into complex projectiles, emerge in the archaeological record as early as the MSA in Africa and the end of the Middle Palaeolithic in Eurasia. They remain in use throughout the Upper Palaeolithic and the LSA, and their shape affords for the manufacture of a diversity of tool types, including awls, eyed needles, harpoons, etc. (e.g., Bertrand 1999, Leroy-Prost 1975, Pétillon 2006, Stordeur 1979, Doyon 2020, d'Errico et al., 2022). Their recurrence in the archaeological attests to the technological potential of such peculiar volumetric conception. During the Mesolithic and early Neolithic, pointed tools represent a large, if not dominant, part of osseous tool assemblages (David 1999, Sidéra 1993). Their shapes follow strict rules both in the selection of the raw material – species and skeletal elements – and manufacturing processes, especially when blank extraction is concerned (Sidéra, 1993). They allow the perception of clear cultural patterns and social networks in space as well as their rapid evolutions through time (Sidéra 2012). These observations suggest some similarities in behavioural trends that are deeply rooted within the African MSA and the European Palaeolithic. Our review of the trajectories undertaken by a volumetric approach of the artefacts briefly summarizes evidence from Africa, Europe, and Asia. We explore the cognitive, social, and environmental implications of the integration and reification of this vast, flexible volumetric conception in the cultural adaptative systems of the members of lineage.

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9h40 - 9h55 — **DISCUSSION (15')**

10h – 10h20 — Coffee Break (20')

10h25 - 10h45 — **Rozalia Christidou*[1], Zoi Tsirtsoni[2] & Dimitria Malamidou[3]**

« Change and long-term trends in the Northern Aegean Neolithic and Bronze Age osseous industries: An update from Dikili Tash » (présentiel/in person)

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[2]CNRS UMR 7041 ArScAn, équipe protohistoire européenne, Université Paris 1 Panthéon-Sorbonne, Université Paris 8 Vincennes-Saint-Denis, Université Paris Nanterre, Ministère de la Culture et de la Communication – France
[3]Ministry of Culture, Ephorate of Antiquities of Serres – Grèce

Using evidence from recent and older excavations at the settlement mound of Dikili Tash in the Northern Aegean (Northern Greece), we discuss change and long-term trends in the Late/Final Neolithic (5th – early 4th millennia cal BC) and Early Bronze Age (late 4th – mid 3rd millennia cal BC) osseous industries from the site and the region. First, we focus on the 5th millennium cal BC and consider flows of new types of artifacts and artifact surface markings. The most significant change was in the use of deer antler. This raw material was redirected to the production of cutting-edge tools, hammers, picks, and sleeves, all perforated by transverse holes for hafting. The production of cutting-edge specimens and, secondarily, hammers perdured in the Northern Aegean and adjacent regions through the first half of the 2nd millennium cal BC. These objects are emblematic of long-term trends in deer antler use. Such macroscopic patterns of technological change and evolution, observed at different temporal and spatial scales, are understood in different ways. At the local and micro-regional levels, the 5th millennium developments in the northeast imply selection and are described by considering the previous technical regime, socioeconomic organization, inter-regional interactions within the eastern Balkans, motivations of local toolmakers for valorizing technical skills and knowledge, and the tendency of the Late and Final Neolithic households to scale up activities and equipment. We lack adequate data to describe similar phenomena in other parts of the Northern Aegean. We avoid generalizing since there were strong regional divisions. These divisions are social and economic constructs. Do they represent valid spatial frameworks for studying technologies of the subsequent period? The final part of the Neolithic, specifically the later 5th and the early 4th millennia cal BC, is underrepresented in the

Aegean and Southern Balkan archaeological records. Dikili Tash is among the few sites testifying to complex and locally distinct mechanisms of settlement and material culture change and variation during this period, and a gap of several centuries exists between the Final Neolithic and Early Bronze Age occupations. The osseous artifacts, especially those made from deer antler, indicate that the trend for diversification continued until about 4000 cal BC. By 3300 cal BC, in the Bronze Age settlements, local peculiarities coexist with a widespread distribution of artifact forms and technical procedures, attesting to considerable inter-regional interaction in the Aegean. We investigate a long process of winnowing of old elements and local adaptations of novel ones. Contrary to other areas, antler use dropped at Dikili Tash and possibly the wider northeast region. This is only one of the effects of readjustment of roles ascribed to materials by the period's households concentrating to sources and techniques that served efficiently the pursuit of economic selfsufficiency.

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10h45 - 11h05 — **Marta Blasco Martín**[1]
« The evolution of hard animal material crafts in a Mediterranean city over 2000 years: Valencia from its bones » (présentiel/in person)

[1]Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València (Depaha UV) – Espagne

We will take a transversal view of the evidence of animal hard materials work in the city of Valencia (Spain). To do so, we will start with the corpus of material studied in the facilities of the city's Municipal Archaeological Research Section, where the materials recovered in urban excavations are deposited. Valencia has a long history, from its Roman foundation in 138 BC to the present day, and in the collections we find objects made from these raw materials that allow us to speak of changes and continuity in the tastes and needs. We will therefore look at the evolution of bone, antler and ivory crafts over time in order to talk about social and economic changes and even changes in beliefs.

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11h05 - 11h25 — **Monica Măgărit**[1]
« Neolithisation of the Lower Danube as reflected by the osseous industry » (Visio/Online)

[1]Doctoral School of Economics and Humanities, Valahia University of Targoviste – Roumanie

First farmers originating in the Near East and penetrating Europe encountered huntergatherer communities exhibiting various subsistence patterns. The contacts between such various economies and thus neolithisation itself, are reflected, among others, by the osseous industry. At the Lower Danube, for the Early Neolithic, the presence of several elements related to Mesolithic traditions draws attention (harpoons, deer canines used as pendants, teeth scrapers etc). New elements also appear, both technologically (manufacture-by-wear techniques – bipartition through abrasion, segmentation with abrasive fiber and perforation by wear technique), and typologically (new categories: spoons, rings or bones with scraping traces, abraded astragalus) that belong entirely to the Neolithic. Another specific element, valid from the Early Neolithic to the beginning of the Chalcolithic, is the poor exploitation of deer antlers and boar canines, in favour of the bones from domestic species. In the Middle Neolithic - we observe a continuity with the Early Neolithic, both at typological and technological levels. However, among the defining elements for the neolithization process, we notice that the pointed tools obtained by bipartition through abrasion no longer appear in this phase either. At the typological level, the previous typological categories are maintained, alongside which new ones appear: belt elements and hairpins. In this study, within the various cultural phases, we discuss the composition of the bone industries, looking for specific innovations or, the conservation of certain typological and technological patterns. Innovation wise, we attempted to identify their moments of appearance and abandonment, to determine if they represented real technological progress and whether their appearance was triggered by the presence of cultural determinants or technological constraints.

11h25 - 11h40 — **DISCUSSION (15')**

Afternoon

Session 6:

Open session / Thématiques libres

13h10 - 13h30 — **Marcelo Javier Toledo**[1]
« Knapped megafauna teeth and bone from Pampean peri-LGM sites (Argentine) » (présentiel/in person)

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Pampas plains Pleistocene sites could be located at great distances from outcrops with rocks suitable for knapping. Although bone technology is common, in at least two sites, we recorded the intensive use of teeth as raw material for flakes and tools. These sites are located in the valleys of the Lujan River (LN) and the Salado River (RSJ), at more than 200 km away from the lithic procurement areas. They are secondary sites formed by fluvial short distance redeposition of ephemeral hunting camps, bearing abundant modified bones and very scarce lithics. They are included in three fluvial sequences dated between 45 and 13 ky BP. The remains of modified teeth are found mainly in the terminal Pleistocene sequence, dated between 17 and 13 ky BP. The teeth correspond to a single species Toxodon platensis, whose habits have been compared to those of modern Hyppopotamus, that presents large incisors that can reach 20 cm in length. They are particularly suitable for knapping since they are compounded by a homogeneous mass of dentin, without internal folds of enamel, that is only wrapping the exterior. Cores, cortical and internal flakes and knapping remains, particularly platform preparation debris, were identified. The observation of several specimens allowed us to define a chaine operatoire, from the preparation of a platform, eliminating the irregular occlusal surface to the peripheral longitudinal flaking. Bipolar knapping, that is, impacts from both the occlusal and root ends, has also been observed. Given the natural curvature of the teeth, the flakes extracted from the labial side, or the convex side, are longer. These flakes are interpreted as expediency tools used aside of lithic flakes during filleting of the same carcass from which they were extracted. Another mode of modification is through lateral flaking, leaving sharp edges of dentin and enamel, and negative flake scars. In this case, the modified tooth is interpreted as a tool in itself and not a mere nucleus. A unifacial instrument with high-angle edges (scraper) and another bifacial one with sharp edges have been identified. The multiple peripheral impact points from a platform, lateral impacts and bipolar knapping rule out a non-anthropic random origin such as those that could be generated during mating fights as observed in modern *Hyppopotamus.*
The first mentions of anthropically modified teeth of Toxodon in the Lujan River valley date from the 19th century [1] and the mid-20th century [2], but they were never considered in the scientific literature [3]. We consider the modification of bone and teeth as a pampean inheritance of pre-LGM adaptations to the mammoth-steppe biome of Siberia and Beringia and/or an adaptation to the remoteness of lithics procurement sites. This technology disappeared when the megafauna, with significant bone cortical walls and large teeth, became extinct and when the lithic procurement social network became more efficient and complex.

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13h30 - 13h50 — **Alice Choyke*[1] & Claudia Sabbini*[2]**
« Passing the Baton: The Bone Tool Material from Arslantepe Tell in Turkey » (présentiel/in person)

[1]Central European University, Budapest – Hongrie
[2]Università degli studi della Tuscia, Viterbo – Italie

Long-term excavations hold an enviable potential for producing deep and detailed investigations. The excavated surfaces recovered tend to be large, producing artifacts from comparable and well-understood contexts. Such excavations pose theoretical and methodological challenges. Discontinuity unplanned transitions in research practice can produce biased results or even actual loss of data, not to speak of loss of insight gained from long years of experience. Such gaps in professional continuity undermine comparisons between old and new datasets, ultimately representing a loss to the archaeological understanding of the site. The University of Rome's excavations at the tell site of Arslantepe (prov. Malatya, Turkey) have been continuous for 62 years. The long years of excavations also saw many changes, especially in recording and documentation. Bone tools only started in the mid-1980s. With the present changing of the bone tool guard, we have concentrated on establishing a bridge between former research protocols and the new research vision to transform challenges into opportunities. The assemblage will now be studied from a variety of new and old perspectives. The aim is to avoid loss of old information and avoid contradictions in data management. In this paper, special attention is devoted to how transitions between the original, experienced specialist and the up-coming new specialist have been planned, and the benefits and disadvantages that have been encountered. Some new, preliminary data from Arslantepe's hard animal material industries from the Late Chalcolithic Period VII (3800-3400 BCE) will be presented to illustrate what can be preserved among former practices and what will be changed while maintaining collegial communication.

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13h50 - 14h10 — **Marie Delassus**[1]
« Bone Carvings in Late Antique Egyptian Furniture: from Standardization to Inventiveness » (présentiel/in person)

[1]Musée du Louvre – Ministère de la Culture et de la Communication – France

Bone reliefs and inlays have long been looked at purely from an iconographic or stylistic perspective. Over the past few decades, however, in-depth studies have also taken their physical properties into account. Research into Alexandrian material has granted us a keener understanding of their context of production. Workshop remains, including rough-outs and cutting waste, have been included into the analysis. The recently published study of 270 decorative furniture elements kept in the Rodin Museum was also a part of this approach. The examination of this important corpus has highlighted recurring osteological and technical characteristics. Analysis of the anatomical distribution, coupled with consideration of the different types of appliqu´es revealed craftsmen's total adaptation to bone morphology. It also seems that some representations were favored depending on the selected bone categories. As for the technical trace, they reveal a systematization in raw material work processes. Despite the obvious reproduction of some iconographic templates, this collection also includes bone carvings bearing witness to elaborate decorative programs, or proposing original designs, thus challenging the strictly serial aspect of bone-carving industry.

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14h10 - 14h30 — **María Fernanda Martínez-Polanco*[1, 2] & Cristian Micó[2, 3]**
« Investigating Trapezoidal Plaquettes Crafted from White-tailed Deer Bone at Cerro Juan Díaz (LS-3) Greater Coclé Culture Area, Panama » (présentiel/in person)

[1]Universitat Rovira i Virgili – Departament d'Història i Història de l'Art, Tarragona, Espagne
[2]Institut Català de Paleoecologia Humana i Evolució Social (IPHES), Tarragona, Espagne
[3]Universitat Rovira i Virgili – Espagne

Cerro Juan Díaz (LS-3) stands as an archaeological site located in the coastal plains of Central Pacific Panama, adjacent to Parita Bay. Spanning an area of 200 hectares, this site witnessed human occupation from 300 BC to 1600 AD. Various zones, including mortuary spaces, middens, residential units, and workshops for bone and marine shell crafting, have been identified within this site. Notably, bones and antlers of white-tailed deer (*Odocoileus virginianus*) were employed as raw materials in the crafting of tools and ornaments. Among the discoveries at the site are remarkable 14 flat trapezoidal plaquettes, measuring between 2.5 and 3.5 cm, frequently featuring perforations. These plaquettes are often found in isolated tombs. This presentation aims to delve into the manufacturing process of these plaquettes, elucidating use-wear traces. Furthermore, this research extends to identify analogous elements in other archaeological sites in Panama, aiming to unravel the intriguing functions of these artifacts.

14h30 - 14h50 — **DISCUSSION (20')**

14h50 – 15h10 — Coffee Break (20')

15h10 - 15h30 — **Ágnes Font**[1]
« Ivory objects from the Medieval Collection of the Buda Castle Museum, Budapest, Hungary » (présentiel/in person)

[1]Budapest History Museum – Hongrie

Excavations carried out by the Budapest History Museum in the Buda Castle District in the last five decades (Hungary) have unearthed a number of artifacts crafted from elephant or walrus ivory. These hard osseous materials, particularly walrus ivory, are comparatively rare within the archaeological findings of the Carpathian Basin. The identification of these animal-derived raw materials has proven to be a challenging task, even for experts, due to the substantial extent of manufacturing, meticulous polishing, and the wear patterns resulting from their usage. Furthermore, historical tendencies in archaeology have often emphasized certain 'intriguing' objects, diverting attention from comprehensive analyses of all archaeological discoveries and assemblages. In the past decade, a more precise determination of the raw materials used in the diverse array of objects was achieved during a reevaluation of the museum's collection. This reassessment revealed that a significant number of items previously categorized as bone were, in fact, made of ivory. The articles and raw materials discussed in this paper are believed to have been introduced to the Carpathian Basin through long-distance trade, donations, diplomatic gifts, or personal accoutrements accompanying individuals of the era. This paper aims to elucidate these connections, as well as the technical, technological, and intellectual transfers occurring in the Carpathian Basin from a broader European context, drawing upon available written records and archaeological sources.

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15h30 - 15h50 — **Hans Christian Küchelmann**[1]
« Bone, antler and ivory artefacts in the Hanseatic maritime trade » (présentiel/in person)

[1]Landesarchäologie Bremen - Allemagne

From the 15th to the 17th century the towns of the Hanseatic League played an important role in Early Modern trade in the whole of Europe. Hanseatic trade with the North Atlantic regions of Northern Norway, Iceland, Shetland, and the Faroes was in many aspects different from other trade destinations. Hanseatic North Atlantic trade centered around bulk goods like stockfish, but other commodities, which could only be obtained from the far North, like e. g. gyrfalcons or polar bear skins, feature a small but prominent role as well. Of particular interest from the aspect of bone working are walrus and narwhal ivory, whalebone and antler of reindeer and elk, imported into Central Europe as raw material. Apart from trade with raw materials there is a range of artefacts from skeletal materials, which are directly related to the North Atlantic trade and offer some particularly deep insights into social relationships, craftsmanship and trade networks. Such artefacts to be presented here range from fishing gear over marine trade tools to gaming pieces etc.

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15h50 - 16h10 — **Jacqui Mulville*[1] & Ian Dennis*[1]**
« Heritage, Craft and Communities » (présentiel/in person)

[1]Cardiff University – United Kingdom

In the preceding decades, the primary author has spearheaded a series of excavations on the Western Islands of Scotland, providing comprehensive reports on the zooarchaeological assemblages and contributing to the analysis of worked bone. The secondary author, on the other hand, has undertaken the illustration, analysis, and recreation of numerous osseous artefacts. This paper describes how our collaborative and integrated approach to worked bone and antler has taken us to Glastonbury festival and beyond.
The worked bone and antler assemblages within insular Scotland are substantial and noteworthy, primarily driven by a reliance on animal resources for artifact production and the exceptional preservation of osseous materials.

This dependence has given rise to a highly skilled and sustainable industry that has endured for millennia. The utilisation of bone and antler encompasses a diverse array of species, both domestic and wild, across land, sea, and air. Rigorous recording and analysis has unveiled intricate details regarding the lifecycle of these artifacts.
This paper provides firstly an overview of worked bone derived from this collection of excavations and affiliated sites. Various methodologies have been employed to understand the production, utilization, and deposition of osseous items, ranging from visual analysis and use-wear examination to proteomics, artefact recreation and the study of depositional practices. The paper aims to disseminate the results and offer reflections on the challenges posed by analysing materials from numerous, extensive, and long-term sites, outlining prospective research avenues.
Secondly, in addition to academic dissemination, we are committed to sharing research with the wider community. The paper outlines how, over the past decade, we have developed outreach and engagement initiatives by providing hands-on teaching of bone working. For instance, annual sessions at the Glastonbury festival since 2011 have involved instructing the public in antler crafts. Furthermore, recent projects include 'train the trainer' workshops, aimed at enhancing the local knowledge base of heritage and craft skills within the communities local to excavations. This dual focus on heritage enrichment and socio-economic sustainability underscores our commitment to broader societal impact.
Finally, the paper will provide insights into how our zooarchaeological, genetic, and worked antler findings has been instrumental in influencing decisions concerning the management of insular deer populations. Currently, the Western Isles, akin to many regions in Scotland, harbour extensive and expanding deer populations primarily overseen for recreational hunting. On South Uist, the challenges posed by deer have spurred discussions regarding their eradication, coupled with inquiries into the origins of the present-day deer population. Through our research, we have illustrated that the Western Isles' deer population represents remnants of an ancient mixed management system established millennia ago, which included management for osseous resources. Particularly noteworthy is the demonstrated value of antler as a renewable and sustainable resource, possessing cultural significance.
Ongoing efforts to coexist with deer entail the exploration of innovative approaches, with archaeological evidence serving to reintroduce the public to the pivotal economic, social, and cultural roles historically fulfilled by these animals. We reflect on our projects potential to exert a positive impact on current deer management and utilization practices, addressing pressing wider concerns related to sustainability and resilience on the islands.

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16h10 - 16h30 — **Justyna Baron*[1], Michał Stasik[2] & Kamil Nowak[3]**
« Impacts of working bone and antler on a bronze knife: Experimental and use-wear studies » (présentiel/in person)

[1]Field Museum of Natural History, Chicago – États-Unis
[2]University of Wrocław – Pologne
[3]Nicolaus Copernicus University Toruń – Pologne

To answer the question if metal knives we found in late Bronze Age deposits (ca. 900–800 BCE) could have been used as multi-tools in processing hard materials like red deer antler and animal bone, we applied an experimental method followed by the use-wear analysis of a replica of late Bronze Age bronze knife. This first experiment focuses on the metal tool instead of the processed material. It included five movements engaging various sections of a knife blade and tip and producing diversified traces depending on the type of technique and raw material worked. We showed that an adequately cast knife, hardened then by cold working, could have been applied in all stages of manufacturing antler and bone objects, from initial material division (cross-cutting) over shaping (surface cutting, whittling) to finishing (scraping, drilling). Although the tool required frequent resharpening, it efficiently performed various movements. The traces on the replica, such as U-shaped notches, chips, blunting, bows, scratches, and serrated and wavy edges, correspond well with those observed on the prehistoric tools.

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16h30 – 16h50 — **DISCUSSION (20')**

16h50 – 17h00 – Short Break (10')

17h00 - 17h20 — **Manuel Altamirano García*[1], Maria Herrero-Otal[2], Raquel Piqué Huerta[2], Antoni Palomo Pérez[2], Anna Homs[3], Ruth Maicas[4], Rafael Ma Martínez Sánchez[5] & Francisco Martínez-Sevilla[6]**
« Approaches to the osseous industry from Cueva de los Murciélagos in Albuñol (Granada, Spain) and its possible relationship with plant-based technologies » (Visio/Online)

[1]UNED (Universidad Nacional de Educación a Distancia) Córdoba - Spain
[2]Universitat Autònoma de Barcelona, Departament de Prehistòria, Bellaterra - Spain
[3]Independent researcher - Spain
[4]Departamento de Prehistoria. Museo Arqueológico Nacional, Madrid - Spain
[5]Departamento de Prehistoria, Universidad de Córdoba - Spain
[6]Departamento de Historia y Filosofía, Área de Prehistoria, Universidad de Alcalá, Alcalá de Henares - Spain

Plant fibers and skins played an essential role within the daily life of past populations, although in most of Mesolithic and Neolithic contexts the preservation of these perishable materials, mainly due to waterlogging or desiccation, is extremely rare. which limits the understanding of these manufactures in the past. However, analyzing tools associated with plant crafts production often yields evidence of these manufacturing processes. Rarely do we have the opportunity to examine both types of evidence from the same site and compare the tools directly with the resulting products. Recent archaeological investigation of the burial site of Cueva de los Murciélagos in southern Iberia, uncovered during 19th-century mining activities, has afforded a new insight into Mesolithic and Neolithic basketry production and other organic artifacts (Martínez-Sevilla et al., 2023).
Here, a preliminary analysis of the worked osseous assemblage from Cueva de los Murciélagos is presented, shedding more light on the importance those items made from hard animal tissues may have had for past societies. As it is common within southern European Neolithic sites both domestic (caprids) and wild ungulate (red deer) long and flat bones were sistematically chosen to manufacture pointed tools ; on the other hand, phalanges were modified to be used as idols, as well as suine lower canines and marine gastropods for personal ornaments.
Regarding their technical features, bipartition by splitting the diaphisis as well as fracture by direct percussion preserving one of the epiphisis as a handle seem to have been the two main procedures to obtain the blanks. On the other hand, shapping was mainly by abrading the surfaces to get the final objects.
Finally, a first functional approach may indicate that at least some of the osseous artifacts could have been involved in the manufacture of plant-based objects documented at the cave, as evidence observed on their surface might indicate in comparison to previous experimental works.

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17h20 - 17h40— **Gilberto Perez-Roldán[1]**
« Mesoamerica and Worked bone: Prehispanic human bones » (Visio/Online)

[1]Universidad Autónoma de San Luis Potosí – Mexique

In this research, three abstract works on the bone industry worked in the territory known as Mesoamerica are presented. The first site is Predio Diana, located in Mexico City, dated to 17,000 BP, it is a collection of 6 pieces of bone megafauna, and belonging to Hunter-Gatherers societies. The other site is La Montesita, dated between AD 600 and AD 1200, located in the state of Aguascalientes, site of chieftaincy societies,It contains a collection of 10 artifacts. The third site is Teotihuacan, a site of state societies, containing a collection of 5,000 objects, belonging between 100 BC to AD 600. In all three collections, we will address the topics of raw materials, manufacturing techniques, and function of artifacts.

17h40 - 17h50 — **DISCUSSION (10')**

17h50 - End of the 2nd day / Fin de la 2e journée

DAY 4 / JOUR 4

THURSDAY 16th May / JEUDI 16 Mai

Salle VASARI First floor/1er étage

Session 3: From material productions to social structures and cultural traditions / Productions matérielles, structures sociales et traditions culturelles

The participants are encouraged to present case studies to discuss issues of use of animal resources as source of information about social actors, socio-economic and cultural systems of the past (nomadic vs. sedentary; experts vs. apprentices etc.). How can we identify the individual, the community behind a technical action/choice or an artifact? What criteria can be used to shed light on these aspects, based on hard animal material productions and technical procedures?

Les communicants sont invités à présenter des études de cas permettant de discuter de l'exploitation des ressources animales comme source d'informations sur les acteurs sociaux, les systèmes socio-économiques et culturels du passé (nomades vs sédentaires ; experts vs apprentis, etc.). Comment cerner l'individu, la communauté derrière une action/un choix technique, un objet (son décor, ses aménagements) ? Quels critères d'analyses permettent d'éclairer ces aspects à partir des productions en MDA et les techniques de travail ?

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8h40 - 9h00 — **Jesùs Tapia*[1], Rodrigo Portero[2, 3, 4], Marián Cueto[5], Rosana Cerezo Fernández[2,3], Jesús Jordá Pardo[3, 6] & Esteban Álvarez-Fernández[2,3]**

« Bone industry in the Upper Paleolithic occupations at El Cierro Cave (Ribadesella, Asturias, Spain) » (présentiel/in person)

[1]Sociedad de Ciencias Aranzadi – Spain
[2]Universidad de Salamanca – Spain
[3]GIR PREHUSAL – Spain
[4]IIIPC-Universidad de Cantabria – Spain
[5]Universitat Autónoma de Barcelona – Spain
[6]UNED, Madrid – Spain

The El Cierro Cave contains one of the most complete sequences of the Cantabrian Upper Paleolithic, since occupations dated to the Aurignacian (levels M and L), Gravettian (levels K, J2, J1 and I), Solutrean (levels H2 and H1) and Magdalenian (levels G1, G, F and E), have been documented. This communication presents the bone industry of the entire sequence, coming from the excavations carried out by F. Jordá Cerdá and A. Gómez Fuentes between 1976 and 1979 and those carried out recently (2016 campaign). The study of the manufactured tools and production waste in antler and bone allows us to reconstruct different operational chains, especially during the Lower Magdalenian, when these remains are more abundant.

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9h00 - 9h20 — **Laure Fontana*[1] & François-Xavier Chauvière*[2]**

« How can the economy of reindeer antlers document the annual cycle of nomadism of recent Palaeolithic hunter-gatherers? The example of Magdalenian occupations at La Madeleine (South-Western France) » (présentiel/in person)

[1]CNRS UMR 7041 ArScAn, Archéologies environnementales – France
[2]Office du patrimoine et de l'archéologie du canton de Neuchâtel section Archéologie, Laténium – Suisse

Circulation in mobile Hunter-gatherers societies is particularly highlighted by transport of resources, as lithic and animal hard material, and seasons of occupation. Studying the annual cycle of nomadism is especially interesting at regions where the procurement locations of siliceous material are known and where there are many faunal remains and Cervid antlers to document seasonality and procurement/exploitation patterns. Indeed, the study of Reindeer antler exploitation,

from an economic perspective, may provide evidence of on-site manufacturing and especially its proportion, as well as the characteristics of antlers acquired near the sites (importance, type, and exploitation goals). Thus, we can contribute to identify annual cycles of nomadism if we determine for each site: 1) the type and proportion of procurement, exploitation and use activities, related to Reindeer antler, 2) hunting and settlement seasons. Regarding the Magdalenian societies of the South-Western France, the challenge of our on-going studies is to identify the patterns of Reindeer antlers procurement and exploitation in a region where Reindeer were hunted all year long. The only integration of data stemming from the zooarchaeological and technological analysis allows us to document such strategies, at the scale of the site as of an annual cycle of nomadism within a geographical area whose boundaries remain to be defined. This was first demonstrated by the study of a recent Palaeolithic site located in the Northern Massif Central (Les Petits Guinards, France) that required a specific method of faunal remains and Reindeer antlers (raw material, waste products, final products) and raised focused questions. The case of Solutrean and Magdalenian sites in South-Western France is a good example of the potential of faunal remains when analyzed with this global perspective. We will present new data on hunting seasons and antler exploitation patterns at La Madeleine to identify the status of this site within the annual cycles of nomadism (concerning Middle and Recent Magdalenian from 1967-1983 Bouvier's excavations). These results will be put in perspective with other regional on-going studies to put forward some hypotheses about the mobility of human groups and the economy of animal resources in this area.

9h20 - 9h40 — **Bibiana Hromadova*[1] & Laurent Klaric[1]**
« Little things count: examining the size differences of Kostenki-Avdeevo spatulas » (Visio/Online)

[1]UMR 8068 TEMPS – France

Kostenki-Avdeevo sites are among to the most famous sites of the Eastern Gravettian of the Central Russian plain. They are characterized by several specific features in lithic industry (e.g. shouldered points, Kostienki knives, etc), hard organic materials, adornments, art objects (figurines) and site organisation. One of the most peculiar and typical tools known among the hard organic material made ones are the spatulas with sculpted head and abundant decoration, that create complex and unique image. These artefacts have been found in the largest Kostenki-Avdeevo sites (Kostenki 1/1, Avdeevo New and Old, Zaraysk) and some other culturally related sites (e.g. Khotylevo II). Unfortunately, in spite of the good taphonomic preservation of traces, function of the spatulas remains unknown.
Spatulas are, with few exceptions, made almost exclusively from splitted mammoth ribs. Transformation of mammoth ribs involved various methods of debitage, that differ between sites or assemblages but allow a high degree of standardisation of the general aspect of the artefacts. Although the raw material used to manufacture the spatula is mainly limited to the frontal mammoth ribs, rare specimens are also made of other materials. As a result, spatula collection from aforementioned sites (almost 80 pieces) is highly variable in the size, ranging from large artifacts to significantly smaller ones. The small ones are not only characterized by different nature of the raw material but consequently also by a different chaine operatoire process. They also show some peculiarities in their overall design.
In the context of the standardized general form of spatulas, the peculiarities of these similar, albeit significantly smaller specimen, have no obvious explanation. It raises many underlying questions about the origin of this variability: could it be related to functions, to idiosyncratic style, or something else? Small size design ("miniaturisation") has been discussed in lithic studies, but this question is more rarely explored for the industries made of hard organic material. One of the possible explanation of this phenomenon is that the use of suitable bones to create morphologically similar objects with a lower time and/or effort investment can also be characteristic of tool making for, or by, younger individuals/children. Proposed lecture aims to discuss explanations for these variations among spatulas, but also to provide further examples of small-size tools from the same assemblages or other Upper Palaeolithic contexts and contribute to the discussion of the social nature of some technological cases.

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9h40 - 9h50 — **DISCUSSION (10')**

9h50 – 10h10 — Coffee Break (20')

10h10 - 10h30 — **Laurent Davin*[1, 2, 3], Natalie Munro[3], Anna Belfer-Cohen[1] & Leore Grosman[1]**
« New perspectives on the symbolic use of birds by the primo-sedentary communities of the Levant: Natufian tibiotarsus beads from Hayonim Cave (Western Galilee, Israel) » (présentiel/in person)

[1]The Hebrew University of Jerusalem, Institute of Archaeology, Jerusalem - Israel
[2]CNRS, UMR 8068 TEMPS - France & UAR 3132, CRFJ, Jerusalem - Israel
[3]University of Connecticut, Department of Anthropology, Storrs - United States

In the Late Epipaleolithic (Natufian) primo-sedentary communities of the Levant (15,000-11,650 years cal. BP), beads made of the distal ends of partridge tibiotarsi (*Alectoris chukar*) are recognised as the significant component of Natufian body decoration in avifauna. More than any other bird species, the partridge would, therefore, have had a special status in the symbolic sphere of the Natufians. Given the over-representation of tibiotarsi in the skeletal profiles of partridges, it has been suggested that Natufian hunters managed the carcasses of this bird quite differently from other prey. A large proportion of the partridges hunted were eaten outside the hamlet, and only the tibiotarsi, a prized raw material, were brought back to the site to be transformed into beads by simply transversely sawing off the distal end. This particular practice, recognised among several Natufian groups, has never been explored in detail. To reveal its informative potential and try to gain new insights into these practices, we have analysed the hundreds of tibiotarsi of all the bird species hunted by the Natufians and collected during the excavation of Hayonim Cave (Western Galilee, Israel). By comparing our experiments with those already published, we have identified previously unrecognised micro-traces linked to butchery activities, the preparation of bead blanks and use-wear traces. In all, we identified 93 beads and around sixty previously unrecognised bead blanks from this Natufian group, doubling the corpus of beads and quadrupling the corpus of blanks known today. Analysis of the spatial distribution of these artefacts, based on a much larger corpus, is proving informative in identifying areas of activity linked to the concentration and processing of these bones prized by the Natufians. As well as revisiting the importance of these body decorations, we have been able to highlight a novel aspect of this ornamental practice, namely the use of a much more comprehensive range of bird species in terms of origin and size than just partridges. So, our preliminary results already allow us to broaden the range of birds to which the Natufians accorded a place in their symbolic sphere, and we can follow the spatiotemporal evolution of this ornamental practice on a community scale.

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10h30 - 10h50 — **Haskel J. Greenfield*[1] & Tina L. Greenfield[1]**
« "It's the Pits": culturally modified animal bone from an Early Neolithic pit house settlement (Blagotin) in Central Serbia » (présentiel/in person)

[1]University of Manitoba – Canada

With the advent of early food producing societies from the Mediterranean littoral to temperate SE Europe, settlement type changes. Above ground rectangular structures are now replaced by short-term pit house occupations. This paper presents the spatial distribution of culturally modified bone (tools, ornaments) at the Early Neolithic (Starčevo culture) site of Blagotin, in central Serbia. The spatial pattern and nature of the various pit features suggests that they were (for the most part) residences organised in a circle around a larger centrally located pit feature. The central pit house contained very large figurines on a fired clay floor placed over a human infant burial and a feasting pit. All of these suggest that the central pit house may have had a ceremonial function. Spatial analysis of the culturally modified bone tools do not indicate any clear special function associated with bone tools for the central pit house structure, while indicating that different activities took place in different pit houses on the site. It will further explore issues such as the identification process (morphological versus polished bone), levels of taxonomic identification, and other technological and taphonomic processes affecting the assemblage.

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10h50 - 11h10 — **Selena Vitezović**[1]

« Aspects of bone manufacturing in the Late Neolithic in eastern Balkans » (présentiel/in person)

[1]Institute of Archaeology, Belgrade – Serbie

Recent rescue excavations carried out in Bulgaria enabled large-scale excavations of several Neolithic sites, which yielded rich portable findings, including bone tool assemblages. Two Late Neolithic sites located in Thrace region, Hadzhidimitrovo and Voden, yielded particularly rich and interesting assemblages, which also included a considerable amount of technical pieces, thus enabling the reconstruction of the chaîne opératoire. This paper will focus on the production of artefacts from long bones. Predominantly metapodial and tibiae bones from large- and medium-sized herbivores were used, followed by occasional presence of other long bones. Two main techniques were used for obtaining blanks, transversal and longitudinal division by grooving and cutting with chipped stone tools and with wet abrasive fibre. Burnishing with sandstone was also an important step in artefact production. The same techniques were used for diverse end-products, thus revealing planned production with high standardisation. Main products were different pointed tools (large, medium and small points), and tools with small oval or straight working edge, used as some sort of chisels. Also, ornamental items were produced from long bones, cylindrical in shape. Perforations were made by drilling. Occasionally, bones were decorated, by dots produced by drilling (unfinished perforations). The technological procedures revealed high know-how, skilful craftspersons, and overall importance of the bone tool production among these prehistoric communities.

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11h10 - 11h30 — **Erika Gál*[1] & Anett Osztás**[1]

« A peculiar tool set from two Late Neolithic – Early Copper Age cemeteries in Hungary » (présentiel/in person)

[1]Institute of Archaeology, HUN-REN Research Centre for the Humanities – Hongrie

The recently studied 88 artefacts recovered from 47 Late Neolithic (Lengyel culture) graves at the site of Alsónyék-Bátaszék, subsite 5603, in Southern Hungary represented a rather great variety of bone, antler and tusk utensils. Besides the most common and frequent types of implements such as points (35% of total tools), pig tusk scrapers (23%), and hooks and toggle harpoons (14%), three peculiar objects forming a set of tool also occurred in a few graves. The same group of utensils seem to have also been found in a few burials in the Early Copper Age (Tiszapolg´ar culture) cemetery of Tiszapolgár-Basatanya in North-eastern Hungary (1).

The toolset consisted of three items: 1- A ca. 40-50 cm long antler 'stick', which usually was a cut-off and a peeled distal part of a crown, thus having a smooth surface and naturally pointed end (2); 2 - A proximal part of an aurochs scapula without any modification, only displaying hand polish in certain cases (2); 3 - A 'hide beamer' made from a cattle or deer metapodium whose diaphysis displays the characteristic concave shaping (3).

These items of yet unknown function have also been recovered as sporadic findings from the waste pits of the settlement at Alsónyék-Bátaszék and other coeval sites, which would suggest that they represented common objects of Lengyel people rather than special offerings with symbolic meaning. Within the graves, they occurred either in pairs or all three together, placed near or on top of each other, usually at the back of the deceased or – less often – at the hand or leg of the buried person. They came to light from burials containing few and many donations alike, but always from male graves except for a single burial unearthed at Alsónyék-Bátaszék, which belonged to a woman whose jewellery and richly supplied grave indicated her high rank in the society.

Aside from the pair of objects consisting of the antler stick and aurochs' scapula from the latter grave, other bone tools characteristic of one or the other sex such as the double rib points (typical of female graves) or hooks and pig tusk scrapers (typical of male graves) occasionally also occurred in the graves of the opposite sex suggesting certain flexibility in gender roles at Alsónyék-Bátaszék.

Our investigations aim to find analogies of the peculiar toolset so far known from only two Hungarian cemeteries of subsequent age and to understand their function in people's daily activities.

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11h30 - 11h45 — **DISCUSSION (15')**

Afternoon

13h15 - 13h35 — **Petar Zidarov* & Rosica Mitkova**
« Is a harpoon just a harpoon? Barbed points and harpoons from Chalcolithic (5th Millennium BC) sites in Upper Thrace, Southern Bulgaria » (présentiel/in person)

[1]Regional Archaeological Museum, Plovdiv – Bulgarie

The documented use of barbed points and harpoons made of hard skeletal tissues has a punctuated distribution and frequency during the later prehistory of Southeastern Europe. After the introduction of the farming economy in late 7th-early 6th mill. BC they largely disappear for about 1000 years to re-appear for a little while during the Late Chalcolithic period (4600-4200 BC) with greatest concentration along the shores of Danube and its tributaries (Mărgărit 2023). So, the (re)discovery of different types of slender harpoons and barbed points from the interior of Upper Thrace in the collections of Plovdiv museum prompted a revision of the state of research on the topic and an impetus to publish the finds from Dolnoslav and Bikovo in detail and in context. The comparative study of their distribution patterns demonstrates that certain types enjoy greater popularity throughout large swaths of the Eastern Balkans, whereas others are limited to micro regions and even single sites. The question whether these differential patterns should be explained through specific environmental adaptations or selective reproduction of social practices paralleled in other artefact types and materials requires a greater and denser frame of reference. This study is intended as a timely contribution to this end.

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13h35 - 13h55 — **Juan A. López-Padilla[1]**
« The luxury of the exotic. Ivory dagger pommels from the Bronze Age Iberian Peninsula » (présentiel/in person)

[1]MARQ (Arcaheological Museum of Alicante) – Spain

Ivory is one of the exotic materials that began to appear in the megalithic tombs of the southern Iberian Peninsula from the Copper Age onwards. Among the wide variety of 3rd millennium ivory objects - pots, combs, plates, pins, buttons, etc. - there are some very elaborate handles of ceremonial flint knives, such as the one found in a tomb at Montelirio, Seville. However, the first ivory pommels for metal dagger handles did not appear until the Early Bronze Age, mainly in the territory of the Argaric culture. Here, the use of luxurious materials - silver, gold and, of course, ivory - as components of prestige weapons - large daggers, halberds and swords - transformed specialised tools of violence into symbols of political power.
This paper compiles the data available so far in the archaeological record from the south and south-east of the Iberian Peninsula and analyses the production and distribution of ivory knobs for dagger handles in the general context of ivory use throughout the 2nd millennium BC.

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13h55 - 14h15 — **Vinayak Vinayak[1]**
« Worked Osseous assemblage from Indor Khera, Upper Ganga Plains, India » (présentiel/in person)

[1]School of Art and Science, Azim Premji University, Bengaluru – India

The archaeological site of Indor Khera was investigated through systematic exploration and excavation between 2002–2010 by a team of archaeologists led by Jaya Menon and Supriya Verma. Archaeological deposits recovered from the site indicate its continuous occupation from approximately the 10th century BCE to the 13/14th century CE. Around 120 osseous tools and debris, mostly made from bone, antler, and ivory were recovered during the excavation in different seasons. The majority of them were found in a pottery production area dating from the 2nd century BCE to the 5th century CE during the horizontal excavation of the 2008-2009 and 2009-2010 seasons. This interesting discovery automatically raises the questions: were people in this area using these tools to make pottery? or along with making pottery, were they also engaged in allied activities/crafts? To answer these questions, in this paper, these tools have been studied macroscopically and microscopically and compared with the tools of some archaeological sites of this region, like Atranjikhera and Jakhera.

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14h15 - 14h35 — **Juan Wang**[1]
« A reconsideration of Parrot cups (Yingwu Bei) from ancient Korean Peninsula » (présentiel/in person)

[1]University of Science and Technology of China – China

The ancient Chinese Parrot cup (Yingwu Bei) refers to a type of drinking vessel crafted from the shell of nautilus, which is found in tropical oceans. Parrot cups are frequently mentioned in Chinese historical texts, but only three have been unearthed from archaeological sites within China. These include the Jianyaomiao Cemetery in Pizhou (AD 280, Western Jin dynasty) and the Rentaishan Tomb in Nanjing (AD 340, Eastern Jin dynasty), Jiangsu province. The Hwangnamdaechong in Gyeongju (5th century), South Korea, stands as the largest surviving royal mausoleum from the Silla period. Two Parrot cups, resembling those of the Jin dynasties in China, were discovered within its southern mound-marking their first and sole appearance outside of China. A Korean researcher suggests that based on manufacturing techniques, it is likely that Silla parrot cups were imported from China and then further processed locally. Furthermore, it becomes evident that shell vessels referred to as "Parrot cups" in historical materials and artifacts from the Korean Peninsula after this period were made using different mollusk species than those employed for Silla parrot cups. However, there remains certain aspects of Parrot cups from ancient Korea that deserve reconsideration. This paper examines archaeological discoveries and historical records from both China and Korea while incorporating modern malacology data to explore the origins and implications of "Parrot cups" throughout Korean history as evidence of trade and cultural exchange between ancient China and the Korean Peninsula.

14h35 - 14h50 — **DISCUSSION (15')**

14h50 – 15h10 — Coffee Break (20')

15h10 - 15h30 — **Claire Houmard*[1] & Edouard Masson-Maclean**[2]
« The tradition of caribou scapula scrapers in the Arctic societies » (présentiel/in person)

[1]Université de Besançon, Laboratoire Chrono-environnement - UFC (UMR 6249) (LCE) – France
[2]University of Aberdeen – Royaume-Uni

In Arctic societies spanning from Alaska to Greenland, such as the Yup'ik and Inuit, caribou holds a central role in both subsistence practices and cultural worldviews. Since the Pre-Inuit cultures, caribou scapulae have been regularly selected for making scrapers. While the skin working process isn't exclusively reliant on these scapula scrapers, they often constitute an integral part of the toolkit employed. While the shape of the caribou scapula is very similar across individuals, scapula scrapers exhibit significant variability in terms of their shapes and dimensions.
Notably, the scapula scrapers from Pre-Inuit and Thule cultures in Canada and Greenland follow the bone's general shape/morphology, focusing on the proximal part with a transversal edge. Conversely, Alaskan Yup'ik scapula scrapers, akin to their Siberian counterparts, retain most of the original bone's length and feature a longitudinal edge. This variation implies that the chaînes opératoires and the use of these scrapers greatly differs. Based on a zooarchaeological and technological approach, this presentation will discuss skin working processes with a specific emphasis on the exploitation of caribou scapulae both in terms of cultural preferences and technical choices.

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15h30 - 15h50 — **Henrique Sarmento Pedro**[1]
« The 13th century, a major economic turning point for craftsmen working with animal hard materials » (présentiel/in person)

[1]Université de Poitiers, CNRS UMR 7302 CESCM – France

The work of hard materials of animal origin remains, in France during the Middle Ages, remains a little-studied or generally neglectd subject, despite recent advances in several regions. An interdisciplinary approach has enabled us to explore the historical and economic aspects of this craft. The question of whether craftsmen are itinerant or sedentary has been a recurring theme since Z. Kurnatowska in the 1970s. Whether sedentary or travellind, it remains a complex task to precisely define the social status of these crafts. Data is scattered, sources are fragmentary, and their situation evolves over time. In western France, this question has been considered from the point of view of aristocratic residences. Regional centers of attraction in the middle of the Middle Ages, there seems to have been a cleavage between before and after the 13th century.

In these particular contexts, the first half of the second Middle Ages is characterized by a more or less sedentary craft industry. The case of Andone (Charente-Maritime) is particularly noteworthy in this regard, due to the quantity of evidence of work over a period of barely half a century. The same can be concluded for Mayenne, where one or more craftsmen seem to have settled on site over a longer period. On the contrary, from the 13th century onwards, these areas became primarily consumer-oriented. Work scraps are rare, if not absent. This relative absence is not suitable for an itinerant craftsman, but rather for another workmanship working on other materials at the same time. Workshops therefore seemed to disappear from these areas, and craftsmen moved to the towns, which were growing at the same time. This is due to the commercial revolution that is affecting Europe during this period, and to the many conflicts that were eroding the relative peace of the countryside. In this context of urban revival, urban centers become strong poles of attraction, with the development of bourgeois elites generating strong demand. Cities were also protective and economically viable, and manufacturers settled there, as shown by "Etienne Boileau's work from this period". Around the 13th century, therefore, the status of animal hard material craftsmen changed, and they became urban and sedentary.

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15h50 - 16h10 — **Ariel Shatil*[1], Barak Monnickendam-Givon[1], Ortal Chalaf[1], Yasmin Szanto[1] & Victor Chernov[2]**
« Currency in Flux and Coins on a Balance: a Bone Tumbrel from Jerusalem and other Medieval Coin Scales » (présentiel/in person)

[1]Israel Antiquities Authority – Israël
[2]ORT Braude College, Karmiel – Israël

During recent excavations in the Western Wall Plaza in Jerusalem, layers dating back to the early Islamic period have been excavated (7th to 11th century CE). One of the interesting findings discovered in these layers is a tiny device carved in bone, used for weighing coins. The function of this type of coin balance is not to measure the exact weight of the coin but to examine whether the coin meets a fixed, known, weight standard. This is a rather rare find. Only a few parallels are recognized in the Land of Israel and its surroundings. Similar installations made mainly of bronze and bone are known from various regions of Europe, mainly from England and Western Europe in the 13th to 15th centuries and from Western Eurasia in the 14th and 15th centuries. In this talk, we will trace the principles of operation of coin balances and identify their owners, when and how they were used. By exploring the role these objects may have had in Medieval European monetary systems, we will try to explain the appearance of such a measuring device in early Islamic Jerusalem and the role it played in the city's economic administration.

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16h10 - 16h30 — **Paul Stokes[1]**
« Bone Apple Corers Identification, History, Use & Demise » (présentiel/in person)

[1]St Cuthbert's Society University of Durham – Royaume-Uni

There is one source of information on the production and use of these objects, but how dependable this is questionable. Other writers use this one source without any reference to it. There is a reliable source for bone apple corers still in use in the 1970's, a television program, that had a large response. Materials, production, social structures, and cultural traditions will be discussed along with bone apple corers' history, use, and decline. Dating these objects is difficult. Although several corers have a date on them, how dependable these are could be questionable in a few cases. The type of bone and manufacturing techniques used can provide insights into the social structures of their time. Corers may have been made by farmhands on the farm there are examples found abandoned in old farmhouses and barns and tend to be plain. Other cores have been crafted meticulously and feature more intricate designs. There is evidence that cores were crafted by hand in workshops, one archaeological site near London appears to have been a small commercial skilled craft site, with whole corers and ivory offcuts retrieved. One group appears to have been produced in factories using mass-production techniques. Also, there are corers made of different, more expensive materials.

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16h30 - 16h45 — **DISCUSSION (15')**

16h45 - 17h00 — Short Break (15')

17h00 - 17h20 — **Esteban Álvarez Fernández*[1,2], Rosana Cerezo Fernández[1,2,3], Alberto Martín-Esquivel[4], Rodrigo Portero[1, 2, 5], Santiago Sánchez-de La Parra[1], Ariadni Ilioglou[6], Valorie Gô[6], Oscar González-Cabezas[1], Alexandre Lefebvre[7], Marcos Perez-Señaris[8], Thomas Sagory[6], Catherine Schwab[6] & Jean-Marc Pétillon[3]**
« Shells revisited: engraved valves from Magdalenian sites in southwest Europe » (présentiel/in person)

[1]Departamento de Prehistoria, Hª Antigua y Arqueología, Universidad de Salamanca, Salamanca - Spain.
[2]GIR PREHUSAL, University of Salamanca, Salamanca -Spain.
[3]TRACES UMR 5608, Université of Toulouse II Jean Jaurès, Toulouse - France.
[4]Universidad Isabel I, Burgos - Spain.
[5]IIIPC-University of Cantabria, Santander - Spain.
[6]Musée d'Archéologie nationale, Saint-Germain-en-Laye - France.
[7]Departamento de Ciencias Históricas, Universidad de Cantabria, Santander - Spain.
[8]Universidade de Santiago de Compostela, Estación de Bioloxía Mariña da Graña, Ferrol - Spain

The review of shells of marine origin from the collections of the MAN (Saint-Germain-en-Laye) has made it possible to document about fifty shells with engravings. These artifacts, some of which have anthropic perforations, come from six sites with Magdalenian occupations located in the Pyrenees (Isturitz, Arudy-Espalungue, Gourdan, Mas d'Azil and La Vache) and in Charente (Le Placard). In this communication, the results of their study are presented and put in context with other objects of similar characteristics documented in southwestern Europe during the Magdalenian

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17h20 - 17h40 — **Vuk Koldžić[1]**
« Boneworking in the Vinča culture: specialized or not? » (Visio/Online)

[1]Freie Universität Berlin – Allemagne

An existence of an early specialization in the late Neolithic and early Chalcolithic Vinča culture has been proposed for various industries, with significant implications for the organization of life in this transitional period. The aim of this research was to investigate whether the same label could be given to the boneworking as well. To achieve this, material from three sites, Vinča - Belo brdo, Selevac - Staro Selo and Smederevska Palanka - Medvednjak, assumed to be representative for the culture as a whole, has been analyzed. Accordingly, contextual data has been considered, as well as relevant aspects of the assemblages. Gathered information reflects a rather typical prehistoric material, but the further insight made it possible to determine characteristics of the production in more detail, and its role in everyday life.

17h40 - 18h00 — **DISCUSSION (20')**

18h - End of the 4th day / Fin de la 4e journée

DAY 5 / JOUR 5

FRIDAY 17th May — VENDREDI 17 MAI

(Salle VASARI First floor / 1er étage)

Session 7:
Tribune des Masters et doctorants / Master and doctoral students forum (1)

9h00 - 9h15 — **Margot Damery*[1] & Claire Houmard*[2]**
« Splitting and/or grooving after the Late Glacial Maximum in Western Europe, between continuity and innovation? » (présentiel/in person)

[1]UMR 7041 - Archéologies et Sciences de l'Antiquité – Université Paris Nanterre – France
[2]UMR 6249 - Laboratoire Chrono-environnement – Université de Franche-Comté – France

During the Late Paleolithic in Western Europe, several techniques were used to process bone materials. Fracturing antler by splitting was the first technique recognized and attested since the Aurignacian period (±40 000 BP). Splitting is a technique which allows the separate material lengthwise dividing, a block in two parts. This technique seems to be gradually neglected and replaced by grooving, for the manufacture of elongated objects made of osseous materials since the Gravettian (±28,000 BP), and almost exclusive in the Upper Magdalenian (±17,000 BP). Grooving "consists of making two longitudinal grooves, converging or parallel, in order to delimit the precise contour of the support that we wish to obtain" (1). In fact, both processes (splitting and grooving) aim to obtain elongated products in order to create blanks to produce tools and/or weapons, as well as various objects. However, for now, splitting appears legibly in the range of debitage techniques only for the early phases of the Upper Paleolithic, and subsequently seems to be only evidenced in rare cases, before a regain of importance for the Mesolithic (±9660 - 6000 BP), finding its peak in the Neolithic (±5800 BP). Three different a spects would merit t o b e f urther d iscussed: 1) the difficulty of identify one technique (splitting) on the other; 2) the nature of the raw material worked; 3) the impact of the climate and environmental changes on the craftsman's decision-making process.

Reference
(1) Goutas N. (2009) – Réflexions sur une innovation technique gravettienne importante : le double rainurage longitudinal, Bulletin de la Société Préhistorique Française, 3, p. 437-456.

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9h15 - 9h30 — **Rosana Cerezo Fernández*[1, 2], Jean-Marc Pétillon[2] & Esteban Alvarez-Fernández[1]**
« Antler technology in the Cantabrian Magdalenian (17-14Ka cal BP): the cases of Tito Bustillo (Asturias), Cova Rosa (Asturias) and the Lower Gallery of La Garma (Cantabria) » (présentiel/in person)

[1]University of Salamanca – Espagne
[2]UMR 5608 TRACES, Université Toulouse Jean Jaurès – France

The recent revision of the faunal remains from the classic excavations at Cantabrian Magdalenian sites such as Tito Bustillo and Cova Rosa (Asturias), and the re-excavation of these sites, have allowed us to increase the number of tools made of antler documented in these contexts. In addition, the comparison of these material remains with others from special contexts like the Lower Gallery of La Garma (Cantabria), currently under excavation, leave open new approaches in the research on antler industry that we intend to complete with our PhD thesis. Our methodology for the analysis of these archaeological remains integrates different approaches: technological reconstruction, experimentation, ZooMs analysis (Zooarchaeology by Mass Spectrometry). This, show us the need to review the collections and, despite the scarcity of research with integral methodological perspectives in this geographical area, the antler industry of the Cantabrian region is fundamental to determine the potential particularities of a specific territory inhabited by human groups.

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9h30 - 9h45 — **Marie-Pauline Vignes*[1, 2], Fabrice Bray[3], Veerle Rots[4, 5], Claire Houmard[6], Patrick Auguste[7] & Marie-Anne Julien[2, 8]**

« Contributions of paleoproteomics to the study of Middle Paleolithic bone tools: the Biache-Saint-Vaast "retouchers" (MIS 7, Pas-de-Calais) » (présentiel/in person)

[1]CNRS UMR 8198 Évolution, Écologie et Paléontologie (Evo-Eco-Paleo), Université de Lille – France
[2]CNRS UMR 7194 Histoire naturelle de l'Homme préhistorique – MNHN, Université de Perpignan Via Domitia – France
[3]CNRS UAR 3290, Miniaturisation pour la Synthèse, l'Analyse et la Protéomique, Université de Lille – France
[4]TraceoLab – Belgique
[5]Fonds National de la Recherche Scientifique, Bruxelles – Belgique
[6]CNRS UMR 6249 Laboratoire Chrono-environnement, Université de Franche-Comté – France
[7]CNRS UMR 8198 Évolution, Écologie et Paléontologie (Evo-Eco-Paleo), Université de Lille – France
[8]GéoArchEon, Viéville-sous-les-Cotes – France

Over the last decades, important discoveries have deeply reshaped our understanding of Neanderthal behaviors, and evidence of non-dietary uses of different kind of animals has notably increased. The use of bones for a variety of daily activities is frequently identified, with so-called bone "retouchers" being the best recognizable and the most numerous (e.g. Martin 1930; Patou-Mathis & Schwab (dir.), 2002; Daujeard et al. 2014; Hutson (dir.) 2018). In parallel, the use of paleoproteomics techniques in zooarchaeological studies of the Middle Paleolithic has increasingly developed in the last few years and is starting to be used on Middle Paleolithic bone tools (e.g. Martisius et al. 2020; Bray et al. 2022; Morin et al. 2023).

To study subsistence strategies as effectively as possible, the taxonomical identification of faunal remains can highlight some trends, with sites geared towards monospecific acquisition of game or more diversified acquisition, thereby reflecting varied behaviors. The high rates of bone fragmentation observed in many faunal assemblages, linked to human or other carnivore activities as well as to post-depositional phenomena, complicates these identifications. When it comes to bone tools, paleoproteomics techniques can be even more important in understanding the exploitation of animals, the key question being: was there any intentionality in the choice of the raw material used?

To address this question, we studied the faunal assemblages of Biache-Saint-Vaast (BSV, Pas-de-Calais), a site that yielded two levels rich in bones of large terrestrial mammals accumulated by Neanderthals. Faunal assemblages were studied using classical zooarchaeological methods (anatomical comparison) showing the predominance of Bos primigenius, Ursus arctos and Stephanorhinus hemitoechus, both within the consumed fauna and the bone tools. The number of tools classified as retouchers, more than 300 from levels IIa and IIb, MIS 7, contributes to the site's originality (Auguste 2002; Sévêque et Auguste, 2018). The fragmentation of the artefacts induced however a high rate of indeterminate taxonomical attributions that can partly blur the reality of the raw material diversity. To try to overcome this potential bias, a paleoproteomical analysis is undertaken using a minimally invasive ZooMS protocol (Bray et al. 2022).

We discuss the results of this minimally invasive method, with no or minimal impact on the fossil material, and demonstrate the interest of the joint application of different approaches and methods in view of an understanding of the choice of this type of bone tool and more generally of the management of large herbivore fauna by Neanderthal populations, in particular with regard to a possible selection and/or choice of specific raw material. We also elaborate on the possibilities and the limits of this type of analysis, mainly concerning the data available for the identification of extinct species, and more generally the rank of the species.

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SÉVÊQUE N. & AUGUSTE P. (2018) – From west to east: Lower and Middle Palaeolithic bone retouchers in Northern France. *In* Hutson (dir.) *The Origins of Bone Tool Technologies*. p. 133-164.

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9h45 - 10h00 — **Emma Bernard*[1], Laurence Bourguignon[2, 3], Sandrine Costamagno[1], Emmanuel Discamps[1], Jean-Philippe Faivre[4], Alexandra Legrand-Pineau[5] & Elise Tartar[1]**
« Enigmatic removal scars on bone fragments from Middle Paleolithic layers at Combe-Grenal (Dordogne, France): an experimental approach » (présentiel/in person)

[1]UMR 5608 TRACES, CNRS - France
[2]Inrap– France
[3]UMR 7041 ArScAn du CNRS équipe Antet – France
[4]UMR 5199 PACEA, De la Préhistoire à l'Actuel : Culture, Environnement et Anthropologie – Univ. de Bordeaux, CNRS – France
[5]UMR 8068 TEMPS, CNRS – France

Although the last decades have been a prolific period for research on Neanderthal's technical systems, our knowledge of their bone tools remains limited. In particular, many Neanderthal archaeological collections include bone shaft fragments with cortical removals interpreted as retouched tools whose scars' origin is particularly difficult to identify. If such scars might indeed reveal intentional flaking of the bones, they might also have been produced by taphonomic processes, accidentally during butchering activities, or while using the fragments for technical purposes. If the former hypothesis was confirmed, such retouched bone tools should be considered as part of Neanderthal material culture and the reasons behind their production should be clarified. These types of traces have been identified on several bone fragments on archaeological site of Combe-Grenal (Dordogne, France). Their study and understanding are at the heart of a PhD thesis work which began in 2020 at TRACES laboratory (UMR 5608, Toulouse, France).
In order to better understand this potential part of Neanderthal material culture, an exhaustive and diversified approach of technical systems, including the study of this type of pieces, is required. In Prehistory, the experimental approach is one of the main methods for accessing hominids' past gestures. This approach is particularly necessary for our field, in which different questions remain, in many ways, unexplored. Although this approach became more widespread in recent decades, the difference between hypothesis-testing experiments and exploratory tests is rarely made. While both experimental methods are equally important, they have not the same scientific goals and do not involve the same degree of preparation. Moreover, experimental protocols are rarely published. Such a practice is however important to ensure the reproducibility of obtained results and to guarantee comparisons between experimental works and different archaeological collections presenting the same kind of bone remains.
At Combe-Grenal, the origin of these marks was investigated using a method combining zooarchaeology, bone microwear analysis and experimentation. We will therefore present all the different steps of the experimental approach, from the set-up to the analysis of both experimental methods (experiments and exploratory tests): a shaft breakage femur experiment and a series of exploratory tests on the use of bone shaft for different activities. We will also present the protocols corresponding to each experimentation and test, the gestures made, the variables explored, the methods used to record the fragments produced, including the archaeological issues behind the project and the results achieved.

10h00 - 10h15 — **DISCUSSION (15')**

10h15 – 10h35: Coffee Break (20')

10h35 - 10h50 — **Constantinos Chondros[1]**
« A fresh look at the Thessalian Neolithic osseous tools: the study from Mandra (Northern Greece, 5th millennium cal BC) » (présentiel/in person)

1Université Paris 1 Panthéon-Sorbonne, ArScAn-UMR 7041, équipe Protohistoire égéenne – France

This presentation examines raw materials and manufacturing techniques for the osseous tools from the Neolithic settlement of Mandra in Thessaly, Northern Greece, and compares with data available from previous studies from the region in order to highlight changing strategies of tool production. A total of about 190 osseous objects were recovered during the excavations conducted at Mandra between 1996 and 1998. Most of them come from later Late Neolithic deposits, dated to the first half of the 5th millennium cal BC. They are mainly cutting-edge tools, awls, and smoothers. There are also two sleeves, a needle, and a bipoint. This assemblage composition fits descriptions of the osseous industries from Thessaly. The sleeves are of chronological significance since they first appear during the later Late Neolithic.
The analysis of the osseous raw materials from Mandra stresses the heavy reliance on domesticated species as well as the selectivity of skeletal elements. Both appear to have experienced little change through time, as indicated

by data from other Thessalian sites. The largest cutting edges were obtained from halved metapodials of cattle. Most of the other cutting-edge tools were based on proximal and midshaft fractures of the diaphysis of tibiae from caprines and, to a lesser degree, pigs. A few specimens were made from splinters representing a quarter or less than a quarter of the diameters of cattle diaphyses. The overwhelming majority of the awls were made from halved metapodials of caprines. The systematic use of halved metapodials also has chronological significance. In the later Late Neolithic, the halves outnumber, for the first time, splinters for making awls. The cutting-edge tools made from metapodial halves only occur during this phase. The smoothers were traditionally made from cattle rib shafts. The sleeves were from red deer antlers, the needle from a split rib, and the bipoint from a splinter of a caprine tibia. The reduction processes were closely related to skeletal elements. Bifacial grooving was employed to reduce metapodials. In all other cases, the blanks were from broken bones, which could originate from food debris produced and discarded within the settlement. The deer antler was cut using percussion.
The low diversity of animal species and skeletal elements should not mask morphological variability within tool classes. Shaping played an important role in the sizes and shapes of awls produced from metapodial halves. The cutting-edge tools based on tibia fragments show variations in the dimensions of the bevels cut to shape sharp edges and in the lengths of the latter. Reliance on shaping is in accordance with observations recently conducted in Thessaly for previous Neolithic phases. In conclusion, this region shows a striking degree of continuity in osseous tool forms and production. Chronological change appears to have been cumulative.

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10h50 - 11h05 — **Eleni Koutsopoulou**[1]

« The Neolithic Bone Industry from Early Neolithic to Final Neolithic: the study from Paliambela Kolindros in the region of Pieria, Northern Greece (6000 - 4700/4500 cal BC) » (présentiel/in person)

[1]Universität Bern / University of Bern – Suisse

This presentation discusses bone-tool making from the Neolithic settlement of Paliambela in the region of Pieria. A total of 378 bone artifacts were collected from layers and units spanning from the Early Neolithic to the onset of the Final Neolithic. The aim is to present the material classification, the raw materials used, the manufacturing techniques applied and the temporal distribution. The assemblage consists of 358 tools, 17 ornaments and some unidentified objects.
The results of the study showed that the bone assemblage from Paliambela includes all the known Neolithic tool categories. The study findings revealed a predominant presence in the bone assemblage from Paliambela of the most common tool categories: the awls and the edged tools. Additionally, the collection comprises less numerous categories including hooks, perforators, handles, and a comb. Some tools seem to be in second use while a significant proportion is characterized by unidentified ones. The high degree of fragmentation, along with a significant extent of erosion, is documented across a substantial portion of the assemblage, hindering the retrieval of valuable information.
The raw material used comes mainly from medium-sized mammals (goats and sheep). A smaller number of larger mammals (cattle, pig, deer) and small animals are found. Certain categories of tools are associated with certain types of bone, such as the tibia with chisels and the metapodials with awls. It is noteworthy that tooth as a raw material is absent from both tools and ornaments. Even though it appears in other bone assemblages of the same period and is mainly used for ornaments.
Grooving and breaking represent the primary reduction techniques, whereas shaping mainly relied on grinding. Perforation was mostly executed using a circular motion with a direction from one side of the object to the other. A direct relation can be observed between manufacturing techniques and particular anatomical parts. For example, sheep/goat metapodials appear to have been processed first by abrasion and then by longitudinal sawing. While there are several cases where the metapodial is first split in half longitudinally and then transversely to give tools from 1/4 of the bone. In general, similar processing techniques to bone tools can be found in ornaments.
On the whole, when all the material is examined, it can be seen that there is no significance differentiation in either the production techniques or categories of bone tools over the long period under consideration. However, it can be said that in the last phases of the Neolithic, tools were more carefully worked and kept in greater lenght. Some unique objects, such as the hook, only appear in the Early Neolithic. Another important aspect of the variation from period to period is the distribution of tools across the site. From the Early to the Late Neolithic there is a shift from a communal to a more closed domestic character. Concerning ornaments, although it has been found in deposits throughout the Neolithic period, it is not possible to speak with certainty of types or categories that persist or disappear, since the small number of finds limits interpretation. There is, therefore, a generally consistent manufacturing tradition and stability.

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11h05 - 11h20 — **Quentin Zarka**
« The boar's tusk helmets, study of the manufacturing process based on the case of Aegina » (présentiel/in person)

[1]Université Paris 1 Panthéon Sorbonne, UMR 7041 – ArScAn, Equipe protohistoire égéenne - France

The article proposes hypotheses about the production of the Aegean boar's tusk helmets which belong 2nd millennium BC. Previous investigations showed a kind of "standardisation" of the manufacturing process for a large part of artefacts discovered in the Mycenaean and Minoan world. However it's not that simple, based on the technological study of the case of Aegina boar's tusk helmet we will try to put in light variability for this assemblage of shaped pieces, but also helmets from different sites. On the one hand, this article focuses on the aspects of the animal resource economy through a study of the different modes of acquisition of raw material (hunt and trade). On the other hand, we will focus our attention on the transformation methods of raw materials. Indeed, our investigation results suggest several technical choices made by the craftsmen according to the shapes of the raw material and the shapes of the finished product. Furthermore, the analysis of the manufacturing processes of helmets shows us to what extent this type of object had a "precious" nature and was linked with individual values. Undoubtedly, hunt and war were omnipresent in the Aegean funerary landscape and give the image of a warrior aristocracy that ruled these societies. This research constitutes the first step of a large study of the Late Bronze Age boar's tusk helmets from mainland Greece and Crete. Multiplication of the technological studies on materials from different sites could illustrate cultural and technological changes in distinct regions and chronological phases during the Aegean Late Bronze Age.

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11h20 - 11h35 — **Xenia Pop[1]**
« The story of the hunter's quiver from the Eneolithic site of Urziceni-Vamă (Romania) » (présentiel/in person)

[1]Institute of Archaeology "Vasile Pârvan", Bucharest, Romania – Roumanie

The present communication wants to present the analysis of a quiver made from an elk (*Alces alces*) antler discovered in 2005 in one of the inhumation graves in the Eneolithic necropolis from Urziceni. The Eneolithic site is located close to the Romanian-Hungarian border and represents the necropolis with the most uncovered tombs belonging to the Bodrogkeresztúr culture discovered until now in Romania. The quiver in question comes from grave no. 30 and was placed between the basin and the heel of the deceased. Grave no. 30 belonged to a man with the skeleton in a crouched position, lying on his right side. The funerary inventory also includes pieces of copper-wire, obsidian blades and arrowheads, pots and a worked boar's tusk. Our research on the quiver concerned not only the conservation techniques required given the piece's fragility, but also the manufacturing schemes used to make it. The fact that such an artifact accompanied a man may reflect the religious beliefs of the community and the social status held both before and after death.

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11h35 – 11h50 — **DISCUSSION (15')**

Afternoon

Session 7:
Tribune des Masters et doctorants / Master and doctoral students forum (2)

13h30 - 13h45 — **Carla Giuliani*[1], Laurine Dumont[1], Anne-Marie Moigne[2] & Pierre Magniez[1]**
« Crafting the Past: Exploring Diversity in Lower Paleolithic Bone Retouchers at La Caune de l'Arago (Tautavel, France) during MIS 13 » (présentiel/in person)

[1]Aix-Marseille Université et UMR 7269 LAMPEA – France
[2]Muséum national d'Histoire naturelle – Histoire Naturelle de l'Homme Préhistorique (HNHP, UMR 7194), Sorbonne Université, Université de Perpignan Via Domitia, Institut de Paléontologie Humaine – France

The bone industry is a fundamental element in the daily life of Palaeolithic populations. Bone retouchers - tools utilised for reshaping lithic tool edges - have long been regarded as emblematic of the Middle Paleolithic. Recent scientific investigations, however, have extended their presence back to the Lower Palaeolithic. The Caune de l'Arago stands as one of the major European sites for this period. The stratified deposits, spanning approximately 13 meters, has yielded abundant lithic and faunal assemblages, particularly in levels correlated with MIS 14 to 12. A recent review of the "J" stratigraphic unit faunal remains unveiled numerous retouchers made on intentionally fractured long bone shafts of ungulates, mainly cervids. Indeed, Red Deer (Cervus elaphus) and Fallow Deer (Dama roberti) constituted the predominant prey of the Acheuleans who occupied the site during the MIS 13 interglacial period.
This study aims to identify and characterise the observed marks on the retouchers using 2D/3D digital microscopy, essential for the archaeometric study of artifacts (e.g., measurements, 3D profiles of marks). Employing a comparative approach, this investigation establishes both similarities and distinctions, including blank morphology and typology of observed marks. The resultant classification proposes several models, contextualised within the broader characteristics of lithic materials excavated from this layer.
The unique features of the retouchers from the J level of the Caune de l'Arago underscore their significance in the toolkit of Lower Palaeolithic prehistoric populations, providing new insights into the behaviors of these human groups. Furthermore, their detailed description will enable the integrated study of other categories of modified bones found at the site.

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13h45 - 14h00 — **Liteboho Senyane**[1]
« An assessment of whether saturated sediment ablation on stationery bone can mimic bone tool use-wear from Earlier Stone Age contexts » (présentiel/in person)

[1]University of Johannesburg [South Africa] – Afrique du Sud

Several taphonomic processes can alter the surface of archaeological bone in a manner that may cause them to superficially resemble bone tools used as digging implements. Under close examination, however, the resultant microwear is usually quite distinct. While many experiments have been done to document the effects of fluvial processes on bone surface alteration, there are many mass soil movement processes whose microwear effects have not yet been properly investigated and which could conceivably produce microwear similar to digging implements.
One example, which pertains to the Cradle of Humankind landscape, is soil creep. We present the results of an experiment that assesses the resultant microwear on stationary bones occasioned by artificially accelerated soil creep processes. We show that the passage of saturated sediments over stationary bones produces rounding and pitting, and does not resemble microwear occasioned either by fluvial transport or experimental digging in sediments. Although there is room to test additional variables, we conclude that the purported bone tools from the Cradle of Humankind sites were not affected by soil creep processes, at least not to the extent that they caused surface alterations.

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14h00 - 14h15 — **Natacha Caurette**[1, 2, 3]
« Interaction and complementarity of bone tools and flint tools in hide-working activities: the example of the Late Solutrean of Combe Saunière 1 (Dordogne, France) » (présentiel/in person)

[1]Université Paris 1 Panthéon-Sorbonne - FRANCE
[2]UMR 8068 TEMPS -Technologie et Ethnologie des Mondes Préhistoriques - FRANCE
[3] UMR7264 - Culture et Environnements, Préhistoire, Antiquité, Moyen-Âge – France

Because of the absence of preserved remains, reconstructing Paleolithic hide-working chaînes opératoires in Western Europe necessitates analyzing the use-wear traces. Often centered on a few specialized flint tools (scrapers), these analyses result in incomplete models. However, numerous ethnographic studies have emphasized the diversity of tool shape and raw material used in hide-working. The choice of tools and their functioning mode becomes a cultural marker for the group that employs them.
This paper presents the results of crossed use-wear analyses on the Late Solutrean lithic and bone tools at Combe Saunière 1 (Dordogne, France). The late Solutrean (24.5/24 to 23.5/23 ka cal BP) in) is known for its bifacial lithic

productions and its challenging climatic context of the Last Glacial Maximum (1). Solutrean technical traditions are characterized by both sophisticated hunting-related productions and more expedient domestic productions (2). Domestic activities, such as hide-working, are perceived as being less organized and, consequently, have been less explored by research. Nonetheless, hide probably was the primary source of protection against the cold, and may thus have played a key role in the economic organization of human nomad groups evolving in such unstable climatic conditions. Unfortunately, this activity during the Late Solutrean has not been comprehensively documented as studies have focused on lithic tools without a systemic approach.
The Solutrean occupations of Combe Saunière 1 were mainly oriented towards hunting activities, but have also yielded numerous domestic tools (3). Several flint and bone objects show traces of hide-working in various states and were used through multiple gestures. They are part of a complex chaîne opératoire, documented from acquisition to finishing end sequenced by many technical processes. Some stages of this chaîne opératoire were conducted with both flint and bone tools, while others were realized with specialized tools solely made of flint or bone. This reconstruction of the chaˆıne op´eratoire thus questions the factors influencing tool selection for different technical processes (mechanical properties of the material, morphology of the tool, morphology of the active part, etc.), thereby shedding new lights on unexplored Solutrean know-how and technical traditions.

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14h15 - 14h30 — **DISCUSSION (15')**

14h30 – 14h50 — Coffee Break (20')

14h50 - 15h05 — **Gabriela Bravo**[1]

« Bone technology of archaic hunters and gatherers from the northern and central coasts of the North Semi-Arid region of Chile » (présentiel/in person)

[1]Université Paris 1 Panthéon-Sorbonne, UMR 8068 TEMPS, Technologie et Ethnologie des Mondes Préhistoriques - FRANCE

Various studies argue that the hunter-gatherer groups that inhabited the northern and central coasts of the North Semi-Arid region of Chile during the Middle and Late Archaic periods (7000-100 B.C.) were part of a cultural unit known as the "Cultura Anzuelo de Concha" (1, 2). This cultural unit is believed to have occupied more than 600 km of the coastline. Its presence in this vast area is suggested based on typological similarities of certain recovered tools, among which a rich and diverse bone industry stands out. Only at the end of the Late Archaic period did some elements point to an incipient process of internal differentiation between coastal groups in terms of lifestyle and social organization (3).
Through the review of ancient collections of bone industry and artifacts obtained from recent excavations, we aim to delve into this alleged archaic cultural homogeneity along the North Semi-Arid coasts. Beyond typological similarities, the techno-economic study of this industry enables us to evaluate the affinities and differences in know-how, lifestyles, and socio-economic aspects of these groups.
This research was funded by the Martine Aublet Foundation (France) and the Institut des Amériques (France), as well as being part of the FONDECYT project 1200276.

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15h05 - 15h20 — **Solenn Rondet-Correc**[1]

« Preliminary study of the Thule bone industry in Northwest Alaska: Rising Whale Site, Cape Espenberg » (présentiel/in person)

[1]Université Paris 1 Panthéon-Sorbonne, UMR 8068 TEMPS, Technologie et Ethnologie des Mondes Préhistoriques - FRANCE

The North American Arctic is home to a dynamic set of modern populations with a rich cultural history dating back to several millennia BC (1) Alaska is a region teeming with archaeological sites, but many of them were excavated long ago and have benefited from little, if any, in-depth technological study. The study will focus on a late cultural entity of the Neo-Inuit tradition, the Thule. As such, the techno-economic approach is interesting for examining material culture and technical knowledge, in order to understand their manufacturing « chaîne opératoire ». The Thule were defined by the Danish archaeologist T. Mathiassen in 1927 (2; 3) on the basis of sites in the central Canadian Arctic. They were maritime hunter-gatherers who settled in the Bering Strait in Alaska and then migrated to the western Arctic from the 13th century AD, gradually establishing themselves there. The Thule had an economy based on acquisition activities such as hunting marine and/or land mammals, fishing and gathering. They used a variety of organic materials such as bones (from marine and land mammals), ivory (from walrus) and antlers, to create a wide range of objects. The collection analysed focuses on the bone industry of Feature 21 at the Rising Whale site on Cape Espenberg, attesting to its good preservation and the wide variety of objects and raw materials used. This structure dates from the Early Thule, i.e. after 1265 cal AD, i.e. from the end of the 13th / beginning of the 14th century AD (4;5).

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15h20 - 15h35 — **Paulina Maruszak**[1]

« T-shape antler axes of the North European plain: technological approach » (présentiel/in person)

[1]Institute of Archaeology and Ethnology pf the Polish Academy of Sciences, Varsovie, Pologne

For hundreds of thousands of years Central Europe was inhabited by various human groups practicing hunter-gatherer style of life. Situation has changed substantially ca. middle of the 6th millennium cal BC when the first farmers - Linear Band Pottery Culture arrived to Central Europe. They reached Poland after crossing Carpathians and Sudeten mountains and settled on the loess uplands of southern Poland. Subsequent waves of settlers arriving from southern Europe in the first half of 5th millennium cal BC, linked with Lengyel Culture, gradually colonized also less fertile sandy soils. The process of neolithization was completed about 4000 cal BC when Funnel Beaker Culture farmers spread north as far as the southern North Sea and the Baltic Sea shores.
Gradual neolithization of the Central European Plain took place in times when southern coastal areas of the Northern and Baltic Sea were inhabited by socially and economically advanced hunter-gatherer-fisher societies. In the cultural context the neolithization of northern parts of the European Lowland seems to be a relatively slow process of growing mutual relations where both sides had a lot to offer. Archaeological evidence of contacts between the hunter-gatherers and early farmers on the Central European Lowland is scarce and T-shape antler axes played a special role as that is the only type of tool produced on a mass scale during 6th and 5th millennium cal BC by the Mesolithic groups and some early Neolithic cultures, including Brześć Kujawski Group of Lengyel Culture on the Polish Lowland.
There is no agreement on the genesis of T-shape axes in the Neolithic milieu. Some researchers suggest their independent production by the Early Neolithic farmers, the other point to Mesolithic genesis of T-shape axes.

Technology of T-shape axes' manufacturing is only fragmentary described and comparative studies in the respect were never so far conducted. The planned doctorate is devoted to multispectral technological, raw material and chronological characteristics of T-shaped antler axes recorded in the Mesolithic and Early Neolithic context on the Central European Lowland. The main hypothesis that will be tested relates to potential transfer of technology of T-shape axes' manufacturing from the milieu of hunter-gatherers to early farmers. If confirmed it would have a crucial importance for understanding their mutual relations. Certainly such a transfer of technology would be a unique social phenomenon with social consequences reaching far beyond a developed exchange relations. In consequence it would be an important voice in the ongoing discussion on the neolithization of Northern Europe.

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15h35 - 15h50 — **DISCUSSION (15')**

15h50-16h10 — Break (20')

Session 8 (1) :

Flash communications

16h10 - 16h22 — **Jean-Marc Petillon*[1], Elise Tartar[1], Laura van der Sluis[2], Krista McGrath[3], Lucía Agudo Pérez[4], Leire Torres-Iglesias[4], Ana B. Marín-Arroyo[4], Christian Normand[1], Camilla Speller[5], Antoine Zazzo[6], Alexandre Lefebvre[4]**

« The elephant in the room: the use of mammoth bones for the manufacture of objects in the Upper Paleolithic of Southwest France » (présentiel/in person)

[1]CNRS, UMR 5608 TRACES - France
[2]University of Vienna - Austria
[3]ICTA, Universitat Autònoma de Barcelona - Spain
[4]EvoAdapta, Universidad de Cantabria - Spain
[5]University of British Columbia - Canada
[6]CNRS, UMR 7209 AASPE -France

In the Upper Paleolithic of Western Europe, the use of mammoth ivory for manufacturing tools, portable art and ornaments is widely documented. Conversely, the use of mammoth bone in that archeological context has rarely been identified, apart from a few Gravettian cases. Here we report six worked objects (including weapons) made of mammoth bone, from five sites in southwest France, identified taxonomically by proteomics using ZooMS (Zooarchaeology by Mass Spectrometry). They were radiocarbon dated and their chronological distribution spans the Upper Paleolithic, from the Aurignacian (Sous-le-Roc) to the Magdalenian (Laugerie-Haute, La Madeleine) through the Gravettian (Brassempouy) and perhaps the Solutrean (Lespugue). Additionally, a technical use of unworked flakes from mammoth bones was identified at another site (Isturitz). The worked objects are too modified to be taxonomically identified and would not have been attributed to mammoth on a visual basis. Meanwhile, the unworked flakes used as tools would have been identified as mammoth but not necessarily classified in the bone industry. We argue that, in the Upper Paleolithic of Western Europe, the use of mammoth bone, while not very frequent, is more common than previously documented, and identification biases account for its underrecognition. More systematic research is necessary to assess the extent of this phenomenon.

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16h22 - 16h34 — **María Isabel Borao Alvarez*[1, 2], Sylvain Ducasse[3] & Jean-Marc Pétillon[2]**

« Placard-type points reloaded: definition, distribution and chronology of a classic index fossil » (présentiel/in person)

[1]Universitat de València, dpt. Prehistòria, Arqueologia i Història Antiga – Espagne
[2]CNRS UMR 5608 TRACES, Université Toulouse Jean Jaurès – France
[3]CNRS UMR 5199·PACEA, Univ. de Bordeaux – France

The Late Upper Paleolithic of Western Europe yielded rich and diverse assemblages of projectile points made of antler. Organizing this diversity in time - i.e., identifying “index fossils” - has been an important issue of Upper Paleolithic research since its beginnings. One century ago, H. Breuil pinpointed a particular subtype of single-beveled point as marking the initial stages of the Magdalenian. Based on the assemblage from Le Placard (Charente, France), he concisely described these points as “quite flat with a wide lancet-shaped base, whose flat side has fan-shaped striations, and no grooves”. Since then, these “Placard-type points” have regularly been cited in the literature, but without any attempt at a more formal definition, neither a more precise assessment of their spatial and temporal distribution: a rather frequent situation for these early seriations of bone and antler industry. Here we discuss this subtype and suggest a formal list of morphometric criteria for the attribution of a single-beveled point to this category. We also discuss its spatial and chronological distribution in the light of recent research on the transition between the Badegoulian and the Magdalenian. This includes the first set of direct 14C dates made on Placard-type points, from two specimens found in the cave site of Bize (Aude).

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16h34 - 16h46 — **Merel Spithoven-Stikkelorum**[1]

« Preliminary results of carrying and shooting experimental Doggerland barbed points » (présentiel/in person)

[1]University of Groningen, Groningen Institute of Archaeology in collaboration with Leiden University, Faculty of Archaeology – Pays-Bas

Mesolithic points are the largest category of bone and antler artefacts from Doggerland (N> 1000)(Amkreutz& Spithoven 2019). Isotope research shows that the Mesolithic inhabitants of Doggerland (slightly) shifted their dietary focus from more terrestrial to more freshwater resources (Van der Plicht et al. 2016). Given the presence of a large number of points during the Mesolithic, these may reflect a technical adaptation to the changing landscape. Most sampled points are made of red deer, some of human bone (Dekker et al. 2021).
The research presented here is part of the author’s PhD project about human-red deer relationships in postglacial Doggerland. It is part of a larger project funded by the Dutch Research Council (NWO) and lead by Dr Hans Peeters (University of Groningen, Groningen Institute of Archaeology): Resurfacing Doggerland. Environment, humans and material culture in a postglacial drowning landscape.
In this research the behaviour of hunter-gatherers will be reconstructed by use-wear analysis on the above mentioned points. What makes the points unique, compared to other European assemblages, is their relatively short length and intensity of (re-)use (Spithoven 2018). Impact scars and reworked barbs are evidence of the latter. Their object biographies can give information about the behaviour of hunter-gatherers in postglacial Doggerland. For this, a representative reference collection is needed to compare wear on experimental points to wear on archaeological points. Several experiments with different quivers as well as shooting experiments have been conducted.

The experimental points were made of metapodia and antler from red deer. Flint blades and flakes were used to cut barbs into points. Different hafting methods and binding materials were used to create a reference collection for these aspects of the biography as well. Three different quivers were used to carry arrows: fallow deer skin with hairs on the inside, fallow deer skin with hairs on the outside and birch bark. Three different shooting experiment will be conducted: deer shooting, bowfishing and replicating ‘missed’ arrows.
The preliminary results for the quiver experiments show that the quiver with hairs on the inside was most efficient (in terms of damage reduction and noise) because it best protects arrows and makes minimal noise. The birch-bark quiver was found the least efficient. In the birch quiver the arrows moved around a lot and made a lot of sound. In addition, this also led to the points getting damaged and detached from their shafts. The use-wear traces as a result of the hide-quiver experiments are similar to use-wear traces present on the archaeological points. It seems likely that a hide quiver was used for (some) archaeological points. This hypothesis will be validated at a later stage. Currently only the deer shooting experiment has been conducted. Bowfishing and replicating missed shots will be conducted in the coming months. The deer shooting experiment showed that the small as well as the large barbed points could be efficient arrowheads. They were able to penetrate deep enough to hit the heart and/or lungs of a small fallow deer, killing it (almost) instantly. The points were even able to penetrate through ribs which would make it easier to kill the deer. However, generally the arrowheads did not last more than a few shots.

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16h46 - 16h58 — **Miriam Luciañez Triviño*[1] & Violeta Moreno Megías[1]**
« Technological choices and identities in funerary contexts during the Phoenician-Punic period: ostrich eggs from Villaricos (Almería) » (visio/online)

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In the past, ostrich eggs were traded and exchanged as a luxury items, often with a symbolic value. During the Iron Age its use and commercialisation boomed throughout the Mediterranean, with an important centre of production and consumption in the Iberian Peninsula and Balearic Islands, in Spain. Our current project focuses on the study of the ostrich egg assemblage from the necropolis of Villaricos (Almeria, Spain). The site is a funerary space linked to the neighbouring settlement, identified with the Phoenician city of Baria, founded in the 7th century BC. With more than 700 documented eggs, Villaricos is not only the largest closed archaeological ensemble in the IP, but also in the entire Mediterranean.
To explore the technology of the production of these ostrich eggshells, the technical choices of 1st millennium BC craftspeople and their chaînes opérationnelles, and the use of the ostrich eggshells in terms of identity representation a multi-methodological approach is being implemented. Thus, we have carried out a techno-typological, stylistic, and contextual analysis of a series of ostrich eggs from the National Archaeological Museum (Madrid) belonging to the Villaricos ensemble. The working traces (tool and technique traces) have been studied with a binocular magnifying glass and digital microscope. The pictorial techniques and pigments have been analysed with Scanning Electron Microscopy - Energy Dispersive X-ray spectroscopy, Fourier Transform Infrared Spectroscopy, X-Ray Microdiffraction and X-Ray Microfluorescence.
We will discuss the choices made by the Phoenicians who settled in the IP and the results of centuries of mutual influence with the indigenous people during the Punic period. We will be able to approach how these groups defined their religious identity based on specific technical and decorative choices, and thus contribute to a recent line of research with a strong impact in the Phoenician-Punic research, that of "the technology of the sacred".

Session 8 (2) :

Posters session / Présentation des posters

17h05 - 18h05 : **Session d'échange entre les auteurs des posters et le public**

1 — Daniele Aureli*[1], Roxane Rocca*[2] & Pierre Magniez[3]
« Bone tools 600.000 years ago in Europe? What method for a correct diagnosis of the presumed bone small tools at the Lower Paleolithic site of Cimitero di Atella (Italy) »

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The site of Cimitero di Atella in Basilicata, southern Italy, known since the 90s, yielded various archaeological levels rich in faunal remains and stone tools within a lacustrine and fluvial stratigraphic succession of the Early Middle Pleistocene (1). Since 2016 a new multidisciplinary research programs (Program Paleo of the École française de Rome) focuses on the valuation of the old collections (2) and of the chrono-stratigraphical context (3). The chronological attribution of the levels at circa 0.6 Ma, and the feature of lithic industries (shaped pieces and small tools), led us to take part in the debate on the emergence of Acheulean in Europe between 0.8 and 0.5 Ma (3).
The faunal remains coming from the Borzatti, and the new excavation, are highly fragmented, and taxonomic identifications are mainly limited to family or genus, namely ungulates and Palaeoloxodon antiquus or Palaeoloxodon-size fragments (3). Among the fauna, a small lot of remains offers a small group of pieces raises questions. These are fragments of long bone, with removals, showing similar feature with the stone small tools.
Are we dealing with bone tools? Could this be waste from bone fracturing? What fracturing technique was used to obtain the blank? Are there any recurring patterns in the volumetric criteria of these blanks, on the hypothetical active and prehensible parts? How they differ from stone tools in terms of technical features and functional potential?
The aim of this poster is to attempt to answer these questions, by a precise description and illustration of the pieces, and proposed hypothesis using the theorical principles and experimental knowledge of zooarchaeology, bone and lithic technology.

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2 — Natacha Buc*[1], Alejandro Acosta[2], Lauti T. Rombolá[1] & Daniel Loponte[1]
« Small tools on animal raw material. Hunter-gatherer assemblage from the Low Paraná wetland »

[1]Instituto Nacional de Antropología y Pensamiento Latinoamericano -CONICET / Universidad de Buenos Aires

Within the bone tool assemblage of late Holocene hunter-gatherers in the Paraná wetland, small harpoon heads, atlatl hooks, lithic spheroids, and shell labrets were discovered. The aim of this paper is to evaluate the significance of these artifacts within the standard sample. Firstly, through the metrical structure, we assess whether the assemblage is statistically different; secondly, we analyze the physical, morphological, and functional structure of the small artifacts to discuss their functionality.

The small harpoon heads and spearthrowers are distinguishable from the standard sample not only in terms of size but also in material variability. Conversely, use-wear patterns do not show significant differences. While strategies involving raw materials and recycling behaviors cannot be ruled out, we suggest the possibility that these small artifacts were used by children for games or training. While not a definitive conclusion, this paper provides an initial perspective on the subject in the area.

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3 — Martina Galetova Laznickova[1]
« Relation of humans and beasts of prey in the Moravian Gravettian: the example of processing of Carnivors bones at Predmosti I – decorated awls »

[1]Moravian Museum – République tchèque

In the Gravettian cultural context of the open air site Předmostí u Přerova (Moravia, Czech Republic), ornamented bone tools were found, historically interpreted as daggers, later as awls. The material that was used are the fibula bones of a lion (*Pantera spelaea*) and the metatarsus of a large cervid. The lion remains constitute about 1.5% of the total NISP (excluding the mammoth) of the faunal assemblage of this locality, but it is a frequently depicted animal of the Moravian Gravettian. Tools and decorative items were also made from the bones of other beasts of prey (Carnivores) - wolves, bears, while in the case of the wolf, the beginnings of its domestication process are documented in Předmostí. The presentation of the intentional processing of bones from carnivores at Moravian sites and their decoration, presented here, could contribute to the knowledge of the relationship between beasts of prey and humans in the Moravian Gravettian.

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4 — Cynthia Kromotaroeno[1]
« The story of needles and pins: what they tell us about Dorestad. An experimental journey »

[1]Universiteit Leiden – Pays-Bas

Bone needles and pins come in a wide variety of shapes and sizes. Research on the bone needles and pins from Merovingian Oegstgeest reveals their versatile character as both personal utensils and craft tools. Bone was present in abundance at the settlement and pins and needles were easy to produce. Still, some needles show traces of reuse. Bone pins and needles can thus tell us not only about the activities that took place within the settlement, but also about the attitude of the people in the past towards their belongings. Did they use needles intensively or only briefly? Did they keep their needles and pins save in a container? Were needles involved in the production of items containing perishable materials such as fur and silk? Were pins used as utensils to braid hair? Experimental archaeology is a means to better identify customs and activities that an artefact underwent during its life. This poster presents recently conducted experiments with bone needles and pins in the hope of getting closer to unlocking the stories behind Dorestad's artefacts and, indirectly, about the people who used them.

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5 — Laura Tordeur Champagne[1]
« Red deer antler tools found in an Early Bronze Age tomb: a new discovery in Valais, Switzerland »

[1]InSitu Archéologie SA – Suisse

Excavations carried out during the summer of 2022 at the Mouresses site in Savièse (Valais, Switzerland) conducted by InSitu Archaeology SA uncovered twenty-one graves consisting of stone cist burials. The grave T12 contained a wealth of artifacts associated with an individual buried on his left side, with his head south-east. Adjacent to the south of the skull, several elements of hard animal material industry were deposited in direct contact with lithic and metal items, probably grouped together and constrained in an organic container that has not been preserved. The preliminary study revealed three red deer antler tools made from beam and tine. These tools, most probably used for flint knapping, accompanied the deceased in his daily life and post-death. This discovery remains, to date, an unprecedented at regional scale for the initial phase of the Early Bronze Age.

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6 — Asta Salicath Halvorsen[1]
« Use-wear of worked bone objects from the Late Epipalaeolithic and Early Neolithic Levant to elucidate perishable material culture »

[1]Ph.D fellow, Department of Cross-Cultural and Regional Studies, University of Copenhagen – Danemark

Perishable material cultures, such as textiles, basketry, and skin working, have remained enigmatic throughout most of prehistory, and have largely been overlooked due to issues with preservation and academic partiality. Knowledge of these materials has primarily relied on serendipitous finds from extraordinarily well-preserved contexts but is generally not included in the large-scale interpretations of the archaeological record. This research aims to explore the role of perishable materials by applying use-wear analysis on worked bone objects from several Late Epipalaeolithic and Early Neolithic sites in modern-day Jordan and Syria. The sites represent important stages from the Natufian to the Pre-Pottery Neolithic periods, allowing for an interpretation of the role of perishable material cultures during the Neolithization process. Concentrating on the methodology of use-wear studies on worked bone objects by integrating microscopy and Reflectance Transformation Imaging (RTI), this poster will present preliminary reflections and results.76/4

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7 — Chong Yu[1]
« Bone weaving implements from Final Neolithic to Late Bronze Age China »

[1]Sun Yat-Sen University – Chine

Sheep and goats were imported into China around 4500 years ago. Together with the exotic animals, the exploitation of corresponding secondary products including wool, milk and traction were also thought to be transmitted by the same event, which greatly benefits the social, cultural and economic connections within the Eurasia continent. However, issues related to wool application and the corresponding weaving techniques were less studied compared to milk and traction. This poster focuses on three pieces of bone tools discovered from Xinjiang Uyghur Autonomous Region and Qinghai Province of China, dating back to 4200 – 2800 years ago (Final Neolithic to Late Bronze Age). The one from Lajia site, was the earliest of its kind in China. The author believes that they could be weft beaters used in weaving activities.

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8 — Selena Vitezović*[1], Nemanja Marković[1] & Ivan Vranić[1]
« Artefact from bird bone from the Late Iron Age site of Kale – Krševica (southern Serbia) »

[1]Institute of Archaeology – Belgrade, Serbie

The site of Kale – Krševica is situated in the southern Serbia region, approximately 15 km from the modern town of Vranje, on the dominant hill by the small river of Kševičkareka. It was discovered in 1960's, and systematically researched since 2001. Excavations revealed structures built in accordance with Late Classical and Early Hellenistic period Greek architectural technology and portable findings with Greek-like characteristics, indicating an important, yet unnamed settlement dating from the beginning of the 4th till the first half of the 3rd century BC. The site also yielded a rich bone tool assemblage, that consisted of pointed tools, antler containers, worked astragals, ornaments, and technical pieces. Among these, one artefact from bird bone was recovered. Artefacts from bird bones are notoriously rare on archaeological sites, and these are the first such finds from the Iron Age period in this region. Artefact in question is small cylinder, most likely used as some sort of needle case or other type of container. The artefact was made from the middle part of the right ulna shaft with some characteristic morphological parts preserved, e.g. dorsal remigial papillae – flight feather attachments. Characteristic parts of bone for determination at the genus or species level are missing (proximal and distal epiphysis). Hence, the taxonomic determination based on the shape and size of the significantly modified ulna shaft is limited to the family Ardeidae.

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