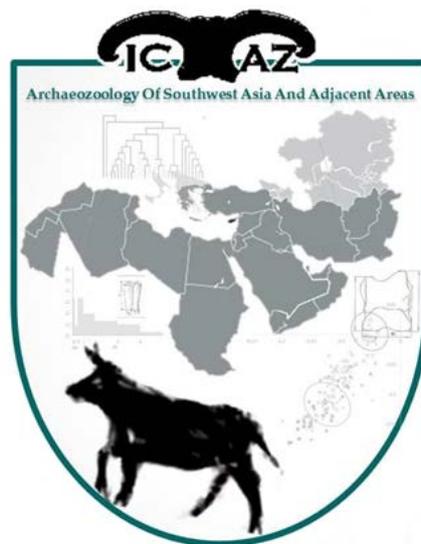


12th International Meeting

of the
ICAZ

**Archaeozoology of Southwest Asia and Adjacent Areas
Working Group**

June 10th – 13th 2015
Groningen – Netherlands



PROGRAMME and ABSTRACTS



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archaeology

Welcome to the 12th ASWA 2015 in Groningen

Archaeozoology of Southwest Asia and Adjacent Areas (ASWA[AA]) is one of most established and active working groups of the **International Council for Archaeozoology (ICAZ)**. Since 1990 ASWA is devoted to the promotion of archaeozoology in Southwest Asia in general and in the Middle East in particular. With this aim in mind, an international conference is organized every other year, either in Europe or in Southwest Asia since 1992. The first meeting of the ASWA working group took place at the Groningen University. ASWA meetings serve as one of the most inspiring medium for archaeozoological research in the Eastern Mediterranean, Southwest Asia, North Africa, Central Asia and the Caucasus ever since. Major topics discussed at the meetings include –but are not limited to– Old World domestication, early state formations, resilience of urban landscapes, former biogeographies, group identities, ritualism, and many other key topics pertaining to the ancient Near East and beyond. Animal Palaeogenetics, biometry, osteomorphology and isotopes in zooarchaeology are only some of the recurring methodological topics discussed in ASWA meetings. Papers read in ASWA meetings are a fine blend of seminal works that influence archaeozoological methods and theory globally and brand-new ideas from young, outstanding scientists.

Now, 23 years later, the international ASWA meeting is back to Groningen both as a continuation of the usual series and to celebrate the career of **Dr. Hjlke Buitenhuis**, who is officially retiring this June. Dr. Buitenhuis is one of the founders of ASWA and the two hosts of the first working group meeting in Groningen. Dr. Buitenhuis' service to ASWA is irreplaceable: He has organized numerous ASWA meetings, served in the scientific committees of others and he has co-edited seven ASWA proceedings.

This 12th ASWA meeting is arguably the largest and most diverse (in terms of topics, institutions, and countries represented) of all the past ASWA meetings, carrying on the spirit of the ASWA by bringing together young researchers and experienced scholars in order to develop research dynamics and achieve highest scientific standards. The organization could not have been realized without the support of the members of the Scientific Committee, **Prof. László Bartosiewicz**, **Dr. Hjlke Buitenhuis**, and **Dr. Sarah Witcher Kansa**, working group liaison **Dr. Marjan Mashkour**, or without the excellent organizing skills and efforts of **Esther Scheele**, lab manager and PhD candidate at the GIA, who has received continuous help from **Yuri van den Hurk**, teaching and research assistant in zooarchaeology, students **Francesca Slim**, **Rianne Breider**, **Janine van Noorden**, **Francis Koolstra**, and volunteers **Dr. Wietske Prummel**, **Adrie Ufkes** and **Tatiana de Vries**.

We wish you a successful meeting and a memorable time in Groningen!

Dr. Canan Çakırlar, Dr. Jwana Chahoud, Dr. Rémi Berthon





Programme

Tuesday 9th June 2015: 12:00-18:00 Registration
& Visit of the laboratories and collections, Groningen Institute of Archaeology.



Wednesday 10th June 2015

| | |
|---|--|
| 08:30 – 09:30 | Registration |
| 09:30 – 09:50 | Welcome speech, Organizers speech |
| 09:50 – 10:00 | Groningen Institute of Archaeology director |
| 10:00 – 10:30 | Zeder M.: A Return to Groningen – ASWA XII and the future of archaeozoology in Southwest Asia (and adjacent areas) |
| 10:30 - 11:00 | Coffee break |
| Session 1: Late Pleistocene and hunting strategies | |
| Chair: H. Buitenhuis | |
| 11:00 – 11:20 | Martin L.: Wildlife hunting in the Levant: The longue durée |
| 11:20 – 11:40 | Yeshurun R.: Contextual taphonomy as an effective zooarchaeological tool: The case of Natufian Mount Carmel |
| 11:40 – 12:00 | Henton E.: Returning gazelles to their habitat: Isotopes and microwear in enamel apatite as markers of the seasonal mobility of gazelle in order to reconstruct hunting strategies in the prehistory of the Azraq Basin, East Jordan. |
| 12:00 – 12:20 | Tornero C., Balasse M., Fiorillo D., Molist M., Saña M.: Re-thinking seasonal migrations patterns of hunted gazelles in Euphrates Valley: Abu Hureyra's model reviewed by stable isotopes |
| 12:20 – 13:30 | Lunch break |
| Session 2: Transition to domestication | |
| Chair: J.-D. Vigne | |
| 13:30 – 13:50 | Allentuck A., Martin L., Roe J.: Domestic maintenance practices in the Early Epipalaeolithic of the Jordanian steppe |
| 13:50 – 14:10 | Lemoine X.: Mesocarnivores in the human niche: Human settlement impacts on local wildlife in the Taurus-Zagros Arc |
| 14:10 – 14:30 | Hongo H., van Neer W., Wouters W., Arai S., Takahashi R., Gundem C. Y., Miyake Y.: Unsuccessful transition to food production: Animal exploitation at Hasankeyf Höyük |
| 14:30 – 14:50 | Pöllath N., Alibert P., Niedermayer J., Matthias R., Joris P. : New approaches to separating wild from domestic sheep |
| 14:50 – 15:10 | Wistoft Nielsen P.: Change of lifestyle, change of choices? How did the early stage of domestication (PPNB) of ovicaprines affect the choices of species for bone tools and objects in the Southern Levant? |
| 15:10 – 15:40 | Coffee break |
| Session 3: Neolithic husbandry: Case studies | |
| Chair: R. Berthon | |
| 15:40 – 16:00 | Arai S., Kadowaki S., Ohnishi K., Guliyev F., Nishiaki Y.: Early animal husbandry in Azerbaijan: Implications for the origin and development of Neolithic in the Southern Caucasus |
| 16:00 – 16:20 | Vigne J.-D., Brunet F., Debue K., Khudzhanazarov M. : Early domestic ungulates in Central Asia: Archaeozoological results from Ajakagyta (Uzbekistan, Kel'teminar, 9th-7th millennia cal BP) |
| 16:20 – 16:40 | Pilaar Birch S., Cakirlar C., Buckley M.: Herding sheep, flocking goats: Neolithic livestock mobility at the site of Ulucak, Turkey . |
| 16:40 – 17:00 | De Cupere B.: Hunting and herding at Neolithic Mursalevo (Bulgaria): Preliminary results of the archaeozoological analysis |
| 17:00 – 17:20 | Uerpmann H.P., Uerpmann M.: Animal Economy at Dosariyah - A Neolithic Site on the east coast of Saudi Arabia |
| 18:00 | Reception & Cocktails |

Thursday 11th June 2015

| | |
|---|--|
| 08:30 – 09:30 | Registration |
| Session 4: Species exploitation Chair: L. Bartosiewicz | |
| 09:00 – 09:20 | Otoni C. et al.: Ancient DNA from cats - a paleogenetics perspective into past distributions and ancient human mediated translocations of <i>Felis silvestris</i> |
| 09:20 – 09:40 | Pawłowska K.: Times of change: Cattle in social practices of Late Neolithic Çatalhöyük |
| 09:40 – 10:00 | Hadjikoymis A., Vigne J.-D.: A multi-site approach to sheep and goat management in prehistoric Cyprus: Synthesis and new insights |
| 10:00 – 10:20 | Arbuckle B.S.: Exploring traditions of equid exploitation in pre- and protohistoric Anatolia |
| 10:20 – 10:40 | Goulder J.: Invisible donkeys (and cows) in the ancient Near East: New archaeological insights into the early systematic use of working animals, using modern studies in developing countries |
| 10:40 – 11:10 | Coffee break |
| Chair: P. Crabtree | |
| 11:10 – 11:30 | Peters J., Neuberger F., Zimmermann M., Grupe G., Buitenhuis H., Pöllath N.: Baselines generated with faunas from 11th-10th millennia cal. BC sites in Anatolia are prerequisite to documenting the transition from hunting to herding caprines |
| 11:30 – 11:50 | Bar-Yosef Mayer D.E., Marder O., Barzilai O., Hershkovitz I., Tejero J.- M.: Shell beads and shellfish at Upper Palaeolithic Manot Cave, Israel |
| 11:50 – 12:10 | Deshpande-Mukherjee A.: Fresh new insights into Harappan shell working from the Kachchh region of Gujarat India |
| 12:10 – 13:20 | Lunch break |
| Session 5: Animal products Chair: N. Marom | |
| 13:20 – 13:40 | Arnold E., Greenfield H., Maeir A. : An examination of economic specialization in the Early Bronze Age city of Tell es-Safi using isotopic analysis of domestic animals |
| 13:40 – 14:00 | Manaseryan N.: Archaeozoological investigation of the site of Shengavit, Armenia |
| 14:00 – 14:20 | Vila E., Chahoud J.: The development of sheep breeds in northern Mesopotamia and the Levant during the third millennium BC |
| 14:20 – 14:40 | Küchelmann Ch.: The Fleas cling to the golden fleece... – A large scale analysis of domestic sheep related archaeozoological data in Central Europe and the Near East from the 7th-2nd millennium BC |
| 14:40 – 15:10 | Coffee break |
| Lightning and Poster Session Chair: B. Arbuckle | |
| 15:10 – 16:30 | Mashkour M., Eisenmann V., Sheikhi Sh., Mashkour M., Kamjan S., Mashkour M., Mohaseb F. A., Azizi Kharanaghi H., Davoudi S., Mashkour M., Abedi A., Mohaseb F.A., Amiri S., Mashkour M., Mohaseb F. A., Naeri R., Beizae Doost S., Mashkour M., Mohaseb F. A., Atayi M. T., De Cupere B., Marinova E., Berger A., Adcock E. S., Arbuckle, B.S., van den Hurk Y., Cakirlar C., Daujat J., Mashkour M., Debue K., Sheikhi Sh., Amiri S., Lhuillier J., Bendezu-Sarmiento J., Farebrother E.: Prust A., Williams, E., Spencer N., Engibaryan N., Manaseryan N., Manaseryan N.: Harutyunova L., Saritas O., Ozbasaran M., Peters J., Buitenhuis H., Pollath N., Spitzer M., Chalendar V., Bartosiewicz L., Gal E., Buckley M., Chahoud J., Berthon R. Poster only: Albesso M., Kaptijn E., Curci A., Maini E. |
| 16:30 – 17:30 | Poster session |
| 17:30 – 18:00 | Guest lecture by W. Prummel |
| 19:30 | Dinner |

Friday 12th June 2015

| | |
|---|--|
| 08:30 – 09:30 | Registration |
| Session 6: Fauna in sociocultural practices | Chair: L. Martin |
| 09:00 – 09:20 | Marom N.: Ritual in non-monumental contexts: Thoughts on four zooarchaeological case studies |
| 09:20 – 09:40 | Weber J.: More than just "good eats": Animals as administrative artifacts |
| 09:40 – 10:00 | Sapir-Hen L.: Jerusalem animal economy in the Iron Age: The relationship between the central city and its hinterland |
| 10:00 – 10:20 | Hourani Y.: Life and death of dogs in Persian Beirut: Evidence from the burials |
| 10:20 – 10:50 | Coffee break |
| Session 7: Archaeozoology of Africa | Chair: V. Linseele |
| 10:50 – 11:10 | Weinstock, J.: Faunal remains from the Pharaonic site of Amara West, Sudan: preliminary results. |
| 11:10 – 11:30 | Lesur J.: Fishing and herding in the Nile Delta during the Predynastic (4th millennium BCE) |
| 11:30 – 11:50 | Kunst G.K., Saliari K., Forstner-Müller I.: Intra-site variation in animal bone assemblages from two urban areas at Tell el-Dab'a (Egypt) - searching for a pattern |
| 11:50 – 12:10 | Chaix L.: Hunting hartebeests (<i>Alcelaphus buselaphus</i>) in Sinai during Persian times (6th to 4th century BC) |
| 12:10 – 13:30 | Lunch break |
| Session 8: Hellenistic, Roman and Medieval studies | Chair: N. Sykes |
| 13:30 – 13:50 | Crabtree, P.J., Campana D.V.: Subsistence and ritual—faunal remains from the Iron Age, Hellenistic, and Medieval site of Kinik Höyük, Southern Cappadocia, Turkey |
| 13:50 – 14:10 | Monchot H., Gourichon L., Stotzel E.: The faunal material from the Roman fortress and its associated church of Khirbet es-Samra (Mafraq Province, Jordan) |
| 14:10 – 14:30 | Corbino Ch.A.: The elite and the villagers in the 14th century AD: Zooarchaeological analysis at Tell Hesban (Jordan) |
| 14:30 – 15:00 | Coffee break |
| 15:00 – 17:20 | Chairs: J. Chahoud & E. Vila Round table: The future of Archaeozoology of South West Asia and adjacent areas |
| 17:20 – 17:40 | Final Notes: Buitenhuis, H. |
| 17:40 – 18:00 | Business Meeting |



12th ASWA 2015
Groningen
10-13th of June 2015

Saturday 13th June 2015

Excursion

Morning:

9:00 – 10:00 Travel to Borger

10:00 – 12:00 Hunebedcentrum Borger

Lunch

12:00 – 13:30 Lunch at Hunebedcentrum

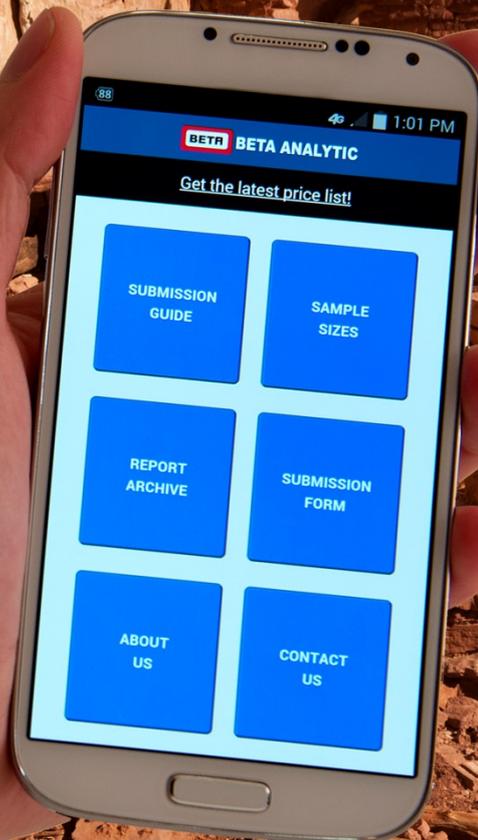
Afternoon:

13:30 – 14:30 Travel to Ezinge

14:30 – 16:30 Museum Wierdenland

17:00 Back in Groningen

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12th ASWA 2015

Groningen

10-13th of June 2015

Abstracts



12th ASWA 2015

Groningen

10-13th of June 2015

Wednesday 10th June 2015

09:30 – 09:50

Welcome speech, organizers speech

09:50 – 10:00

Speech Groningen Institute of Archaeology director

KEYNOTE

Wednesday 10th June 2015

10:00 – 10:30

Melinda A. Zeder

Smithsonian Institution; USA; zederm@si.edu

A return to Groningen – ASWA XII and the future of archaeozoology in Southwest Asia (and adjacent areas)

Since the first meeting in Groningen 23 years ago, ASWA was grown in size and coverage of archaeozoology in Southwest Asia. Not only has the size of the meeting increased in terms of participants and number of presentations, also the working group has expanded in the number of countries represented by participants and in the geographic and topical reach of the papers and posters presented. Southwest Asia with its deep history and its long record of archaeozoological research is a primary area to consider key questions about the history of human/animal interaction – from hunter-gatherer prey strategies during times of major climatic change, to domestication, to the role of animals in the economies, social identities, and religious experience in urban societies. As ASWA returns to its birthplace and as Hylke Buitenhuis, one of the founding members of ASWA, approaches retirement, it seems fitting to take a look at the program for the upcoming meeting as a way of tracing some of the themes and issues that ASWA participants have considered over the past twelve meetings. With the considerable challenges that our discipline faces in these turbulent times in Southwest Asia, it also seems fitting to discuss some of the future obstacles and opportunities for advancing our understanding of the historical human/animal interaction in this keystone region.



12th ASWA 2015

Groningen

10-13th of June 2015

Session 1: Late Pleistocene and hunting strategies

Wednesday 10th June 2015

11:00 – 11:20

Session 1: : Late Pleistocene and hunting strategies

Louise Martin

University College London Institute of Archaeology; United Kingdom; louise.martin@ucl.ac.uk

Wildlife hunting in the Levant: the longue durée

Archaeologists, and zooarchaeologists as a sub-group, tend to study relatively short-term activities. Research is often aimed at 'event history', or the understanding of a single archaeological period or transition, or all too frequently in zooarchaeology, a single site explanation. What are the benefits then of examining longer-term patterns, cycles and structures, or as the Annales school of historical writing designated their approach - the *longue durée*?

This paper considers the long-term history of Jordan's steppe-desert landscapes, which were rich in wildlife from deep prehistory at 20,000 BP until the 20th century AD, to ask whether cycles, frameworks and structures can be drawn out that influence how successive societies (archaeological 'cultures', 'peoples' and empires) inhabited or used the steppe-deserts, and engaged with the abundant wildlife there. Key to this is the knowledge that the steppe-deserts have been major long-term hunting grounds for successive societies, from prehistory to the recent past. This paper asks: what are the persistent structures that the location, landscape, seasonality and wildlife characteristics of the area place on societies that inhabited the steppes and deserts? Despite seemingly having no historical or cultural continuity in occupation trends, are there long-term patterns that can be helpful to zooarchaeologists studying the deep past about the way people and wildlife have engaged? This line of enquiry also falls within the spheres of conservation biology, where long-term zooarchaeological and archaeological data can aid understanding of the potentials of landscapes for wildlife reintroductions and management for the future.



12th ASWA 2015

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10-13th of June 2015

Wednesday 10th June 2015

11:20 – 11:40

Session 1 : Late Pleistocene and hunting strategies

Reuven Yeshurun

University of Haifa, Zinman Institute of Archaeology; Israel; ryeshuru@research.haifa.ac.il

Contextual taphonomy as an effective zooarchaeological tool: The case of Natufian Mount Carmel

Contextual taphonomy means the integration of the stratigraphic and contextual data with zooarchaeological and taphonomic data, to clarify the 'life history' of a faunal assemblage in a given context; animal remains may potentially be excellent indicators of site-formation processes, refuse behavior and activity areas and, by extension, of site type and occupation intensity. A contextual taphonomy approach was recently applied to Natufian animal remains in Mount Carmel, Israel (ca. 15,000-11,500 cal. BP) in order to discern the formation and function of architectural contexts in this early sedentary society. At the Early Natufian basecamp of el-Wad Terrace, contextual taphonomy showed that a sequence of structures was used for everyday living activities, probably at the household level. The inhabitants did not systematically engage in the clearing away of organic trash or otherwise marking out their houses, carrying important implications for the perception of the house in this period. At the Late Natufian cemetery of Raqefet Cave, a comparison to the el-Wad habitations showed the animals remains to reflect short and punctuated periods of human activity in the cave, reaffirming its interpretation as a specialized burial site. This approach also identified fluctuations in site-occupation intensity through the 3,500-year-long Natufian sequence of el-Wad, and shed important light on bone tool manufacture, to name two additional contributions. This type of study requires good control of the archaeological contexts of the bones, full collection and analysis procedures, and laborious recording of taphonomic variables. The reward is being able to offer a more social-oriented and localized zooarchaeological view on the life of the Natufian inhabitants of the Mount Carmel Caves. The application of contextual taphonomy is potentially suitable to a range of archaeofaunal (and other) studies in a variety of periods and contexts.



12th ASWA 2015

Groningen

10-13th of June 2015

Wednesday 10th June 2015

11:40 – 12:00

Session 1 : Late Pleistocene and hunting strategies

Elizabeth Henton

University College London, Institute of Archaeology; United Kingdom; e.henton@ucl.ac.uk

Returning gazelles to their habitat: isotopes and microwear in enamel apatite as markers of the seasonal mobility of gazelle in order to reconstruct hunting strategies in the prehistory of the Azraq Basin, East Jordan.

A major attraction for Epi-Palaeolithic hunters and Early Neolithic hunter/herders in and around the Azraq Basin, East Jordan, would have been the presence of large gazelle herds, as attested by the dominance of their remains in over twenty published sites. Some of these sites are ephemeral and some are 'mega-sites', generating debate on the seasonality of hunting activity and site occupation. An understanding of the seasonal distribution of gazelle would undoubtedly make a useful contribution to that debate. Was the Azraq Oasis an end point for seasonally migrating gazelle herds, or was it the year-round centre for locally aggregating and dispersing sub-groups? Four models of gazelle seasonal mobility have been proposed by the Leverhulme Project 'Prehistoric Hunting Strategies in Jordan'.

One approach taken by our project is to test these models using isotopic signatures as environmental markers; these have been captured in sequential samples from archaeological gazelle molars. The palaeoenvironment of the Azraq Basin allows oxygen, carbon and strontium isotopic values from individual gazelle jaws to discriminate season, forage and location throughout a year of its life. Each model of gazelle seasonal mobility might be expected to generate a unique signature in the combined suite of datasets. Dental microwear signatures on the same tooth relate to forage-type just preceding death. As knowledge of plant growth habit allows the season and location of death to be inferred, it is possible to show how and at what time of year hunters intercepted their prey.



Wednesday 10th June 2015

12:00 – 12:20

Session 1 : Late Pleistocene and hunting strategies

Carlos Tornero^{1,2}, Marie Balasse¹, D. Fiorillo¹, Miquel Molist² and Maria Saña^{2,3}

1. "Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnements"; France; ctornero@mnhn.fr; balasse@mnhn.fr; fiorillo@mnhn.fr

2. "Seminari d'Arqueologia del Pròxim Orient (SAPPO)". Prehistory Departament. Prehistòria. Edifici – C. Campus Universitari. Universitat Autònoma de Barcelona; Spain; Miquel.Molist@uab.cat

3. Laboratori d'Arqueozoologia. Prehistory Departament Universitat Autònoma de Barcelona; Spain; maria.Sana@uab.cat

Re-thinking seasonal migrations patterns of hunted gazelles in Euphrates Valley: Abu Hureyra's model reviewed by stable isotopes

In Abu Hureyra (Middle Euphrates Valley, Syria) Tony Legge and Peter Rowley-Conwy (1987a and 1987b; 2000) proposed a model where gazelles could only be exploited during season-specific periods. The model was constructed using age of death based on tooth eruption and wear stages, modern gazelle ethology and data from 17th to 19th century historical accounts. A key aspect of this model is the season and seasonality of births for gazelle (from which seasonality and season of kill events were inferred) established from modern gazelle ethological observations, which were transferred to the period and area of study where this information is unavailable.

In our work, seasonal reproduction patterns are tracked directly from sequential analysis of oxygen isotope values along the tooth crown of gazelles recovered from Tell Halula, a settlement very close to Abu Hureyra, and with contemporaneous PPNB occupations. Results suggest that gazelles follow a synchronized seasonality of birth, similar to modern references from northern locations and that variability in the timing of tooth crown formation is not significant. This confirms the assumptions in Abu Hureyra's model and strengthens the reconstruction of the seasonality of hunting. Secondly, combined sequential oxygen and carbon stable isotope values are evaluated in order to track seasonal movements and reconstruct potential migratory patterns described by the model. Information is contextualized with available ethological and ecological data and paleoenvironmental reconstructions during PPNB occupation in the Middle Euphrates Valley.



12th ASWA 2015

Groningen

10-13th of June 2015

Session 2: Transition to domestication

Wednesday 10th June 2015

13:30 – 13:50

Session 2: Transition to domestication

Adam Allentuck, Louise Martin and Joe Roe

University College London, Institute of Archaeology; United Kingdom; a.allentuck@ucl.ac.uk; louise.martin@ucl.ac.uk; joseph.roe.12@ucl.ac.uk

Domestic maintenance practices in the Early Epipalaeolithic of the Jordanian steppe

Excavations of Early Epipalaeolithic (ca. 22-18 ka BP) deposits at Kharaneh IV, a 'mega-site' in the Azraq Basin of the eastern Jordanian steppe, are uncovering abundant, well-preserved faunal remains from hearths, middens, pits, caches and some of the earliest and best-preserved brush hut structures in the Near East. A constrained series of AMS dates in the context of high-density faunal and lithic assemblages suggest that Kharaneh IV was intensively and repeatedly occupied by aggregating groups of foragers over a maximum span of about twelve hundred years. In keeping with other Epipalaeolithic faunal assemblages from the southern Levant, gazelle predominates over all other animal taxa in the Kharaneh IV assemblage. Equid, fox, hare and tortoise are also well represented, while aurochs, wolf or dog, and ostrich comprise minor components of the collection. Although gazelle dominate taxonomic abundance tallies in most contexts, they are less abundant than the collective contribution from small fur-bearing mammals and tortoises in a brush hut dwelling (Structure 1). One of the other outstanding features of the assemblage is the conspicuous frequency of anatomical articulations, which include paired gazelle horn cores, canid skulls, fox and hare feet, partial vertebral columns of large and small ungulates and tortoise shells. While some of these articulations are ascribed to low post-depositional disturbance, others represent the residues of structured discard practices. Another example of structured deposits at Kharaneh IV is a cache of burnt aurochs and gazelle horn cores. While refuse disposal and structured deposition are conventionally regarded as practical and symbolic behaviours, respectively, we argue that both were formal, deliberate, habitual practices that together constituted alternate forms of Early Epipalaeolithic domestic maintenance.



12th ASWA 2015

Groningen

10-13th of June 2015

Wednesday 10th June 2015

13:50 – 14:10

Session 2: Transition to domestication

Ximena Lemoine

Washington University in St. Louis; USA; ximena.lemoine@wustl.edu

Mesocarnivores in the human niche: Human settlement impacts on local wildlife in the Taurus-Zagros Arc

Small to medium sized carnivores (termed mesocarnivores), such as foxes, badgers, and wildcats, have gone understudied at Near Eastern archaeological sites, despite their ubiquity and abundance. Recent evidence from ecology and conservation biology has demonstrated that the biological role of these mid-level carnivores in trophic communities has similarly been underestimated. Consequently, the diachronic study of mesocarnivores found at archaeological sites should provide new insights into two discrete, though interrelated processes: domestication and human impacts on the environment. Understanding how mesocarnivores navigated in and were affected by the human niche will elucidate why animals under similar circumstances were eventually domesticated and others were not. Likewise, applying ecological theory to archaeological data allows mesocarnivores to serve as useful indicators for how the human niche altered selective pressures and transformed local wildlife and trophic systems.



12th ASWA 2015

Groningen

10-13th of June 2015

Wednesday 10th June 2015

14:10 – 14:30

Session 2: Transition to domestication

Hitomi Hongo¹, Wim van Neer², Wim Wouters², Saiji Arai³, R. Takahashi⁴, Can Yümni Gundem⁵ and Yutaka Miyake⁶

1. *Sokendai Graduate University for Advanced Studies; Japan; hongouhm@soken.ac.jp*

2. *Royal Belgian Institute of Natural Sciences; Belgium*

3. *University of Tokyo; Japan*

4. *University of Yamanashi; Japan*

5. *Batman University; Turkey*

6. *University of Tsukuba; Japan*

Unsuccessful transition to food production: Animal exploitation at Hasankeyf Höyük

Result of analyses of faunal remains from Hasankeyf Höyük, a Prepottery Neolithic site located in the eastern part of upper Tigris Valley, is presented. The site is dated to the 10th millennium cal. BC and contemporary with Hallan Çemi, Körtik Tepe, Gusir Höyük, and Demirköy. The subsistence at Hasankeyf Höyük is characterized by a broad spectrum but localized resource exploitation strategy. Wild sheep was the most important game, as well as red deer, and wild boar was also important in the earlier part of occupation. Aurochs bones are very rare. Although archaeological remains as well as burial practice suggest that the 10th millennium sites in the region had a common material culture and social system, each site seems to have highly adapted to the local environment in the immediate vicinity of the settlement. Bones of Cyprinidae fish are also commonly found in the faunal assemblage. Among the ungulates, pigs are killed relatively young, although the size of pigs at Hasankeyf is comparable to that of the wild pig population. These Pre-pottery Neolithic A sites in the eastern upper Tigris region flourished during PPNA and achieved a certain degree of complexity in both symbolic system and technology, but they were all abandoned at around 9000 BC. Highly successful adaptation to local environment might have prevented the smooth transition to the food producing economy.



Wednesday 10th June 2015

14:30 – 14:50

Session 2: Transition to domestication

Nadja Pöllath¹, Paul Alibert², Johannes Niedermayer³, Matthias Renz³ and Joris Peters^{1,4}

1. *ArchaeoBioCenter and Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München; Germany; nadja.poellath@palaeo.vetmed.uni-muenchen.de*

2. *Université de Bourgogne ; France*

3. *Institute for Computer Science; Ludwig Maximilian University Munich; Germany*

4. *ArchaeoBioCenter and Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München; Staatssammlung für Anthropologie und Paläoanatomie, München; Germany*

New approaches to separating wild from domestic sheep

In the frame of the research project on the subsistence of Pre-Pottery Neolithic societies in Upper Mesopotamia, the main interest of the archaeozoological team is tracing the transition from hunting to farming. Among others, a major aspect is the documentation of the early stages of domestication for *Bos*, *Sus*, *Ovis*, and *Capra*. For this, osteometric data were long of particular importance since the reduction in size was considered a good marker for domestication but has been questioned in recent years. However, 'size' is only one morphometric property of a bone, the other being 'shape'.

Geometric Morphometrics (GMM) is a collection of tools for the statistical analysis of shape, which has been successfully applied to teeth and crania, for example, and is particularly appropriate when differences between populations are expected to be minimal. With teeth and crania being very rare at the sites under study, the astragalus was chosen as the skeletal element for this pilot study since this skeletal element is present in reasonable numbers and is usually well-preserved. In the centre of this study stands *Ovis*. Parallel to this line of research, a computer supported 3D-shape analytics approach is being developed by using data-mining techniques in order to semi-automatically identify significant features for the differentiation of wild and domestic sheep. However, since both approaches need appropriate recording methods that are quite time consuming, and - in the case of 3D data-mining techniques - require specialized scanning equipment and data-mining operations running on a computer with high processing capacity, these approaches are difficult to apply in the field. For this reason, the second aim of our study is the development of traditional osteometric methods based on the results of the GMM and the data-mining approaches that could help classifying specimens in the field and could be included into archaeozoological fieldwork routines.



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Groningen

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Wednesday 10th June 2015

14:50 – 15:10

Session 2: Transition to domestication

Pia Wistoft Nielsen

1. University of Copenhagen; Denmark; paniel@gmail.com

Change of lifestyle, change of choices?

How did the early stage of domestication (PPNB) of ovicaprines affect the choices of species for bone tools and objects in the Southern Levant?

In the early stage of domestication in the Southern Levant (PPNB 8700-6500 BC) the percentage of bones from ovicaprines found in the faunal assemblages increases compared to previous periods. In the Natufian period in the Levant gazelles dominated the assemblages of faunal material found. This paper will present the results of analyses of the choices of material for bone artefacts from four PPNB sites (MPPNB Shkarat Msaied (308 artefacts), MPPNB Beidha (297 artefacts) (only preliminary results currently), LPPNB Ba'ja (295 artefacts) and LPPNB Basta (588 artefacts).

The worked bones from the four sites display many similarities in the choice of raw material, but also differences have been observed especially when comparing the MPPNB sites to the LPPNB sites.

The paper focuses on whether or not the increased percentage of ovicaprine bones (and by the LPPNB domesticated ovicaprines), found in the faunal material in these sites is also evident in the worked bone assemblage? Goat and sheep bones represent a high number of the species chosen for both tools and objects from the four PPNB sites. However differences are seen both over time and in the various sites when it comes to preferences for maintaining the use of gazelle and other wild animals compared to sheep and goats. Both fused and unfused bones are part of the worked bone assemblages from the four sites analysed, however young animals seem to have only been preferred for certain tools or objects.

The results of the analyses of the worked bones from the four PPNB sites also show similarities in choices of specific types of tools made exclusively from specific bone elements from the same species. The paper aims to discuss how these choices of raw material for bone tools and objects reflect practical choices, but also how traditions, skills and rituals in the bone industries are changed over time in the early stage of domestication.



Session 3: Neolithic husbandry: case studies

Wednesday 10th June 2015

15:40 – 16:00

Session 3: Neolithic husbandry: case studies

Saiji Arai¹, Seiji Kadowaki², K. Ohnishi², Farhad Guliyev³ and Yoshihiro Nishiaki¹

1. *The University of Tokyo; Japan; araisj@outlook.com*

2. *Nagoya University; Japan*

3. *Institute of Archaeology and Ethnology, Azerbaijan Academy of Sciences; Azerbaijan*

Early animal husbandry in Azerbaijan: Implications for the origin and development of the Neolithic in the Southern Caucasus

Recent archaeological research in Armenia, Georgia and Azerbaijan has significantly extended our knowledge about Neolithic cultures in the Southern Caucasus region. Archaeozoological studies to reconstruct general trends of animal economy during the period have also made substantial progress.

In this paper we present new archaeozoological data on the faunal assemblages from two Pottery Neolithic sites in Azerbaijan: Göytepe and Hacı Elamxanlı Tepe. Both sites are located in the Tovuz region, west Azerbaijan. While Göytepe is one of the largest mounds in the region dated to early and mid-6th millennium BC and belongs to Shomutepe-Shulaveri culture, Hacı Elamxanlı Tepe represents a small mound settled during the beginning of 6th millennium BC. Since no earlier Neolithic site has been found, comparative study of these sites is of great importance to trace the establishments of early agricultural villages in the region.

Faunal assemblages from these two sites mainly consist of domestic animals. However, significant differences are also present. Firstly, cattle is almost absent at Hacı Elamxanlı Tepe. Secondly, red deer antler objects are more common at Göytepe, reflecting the practice of a more enhanced broad-spectrum economy. This trend, together with the higher frequency of forestial mammals and the increase of stone axes at Göytepe, indicates more intensive exploitation of forest environment. Thirdly, while the culling profile for caprine is little different between these two sites, the measurement data of sheep shows an increase of female individuals at Göytepe, indicating a development of herding technique.

Finally, on the basis of these archaeozoological results as well as analysis of other archaeological data, we will discuss the possible origin and development of Neolithic economy in the Southern Caucasus. Results of a DNA analysis of domestic goats, which suggest a link with eastern Turkey during early 6th millennium BC, will also be reported.



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Session 3: Neolithic husbandry: case studies

Jean-Denis Vigne¹, Florian Brunet², Karine Debue¹, M. Khudzhazarov³

1. Centre National de la Recherche Scientifique – Muséum national d'Histoire naturelle; France; vigned@mnhn.fr

2. Centre National de la Recherche Scientifique - Université Panthéon-Sorbonne; France

3. Academy of Sciences of Uzbekistan; Uzbekistan

Early domestic ungulates in Central Asia: archaeozoological results from Ajakagytm (Uzbekistan, Kel'teminar, 9th-7th millennia cal BP)

Ajakagytm is a Neolithic lake shore site located in the central desert of Uzbekistan (Kyzyl-Kum), a region for which the archaeozoological data are rare and sometimes questionable. New excavations conducted since 2005 by the French-Uzbek mission MAFANAC evidenced several successive Kel'teminar occupations dating from the end of the 7th to the 5th millennium. They provided more than 50 000 microlithic artefacts, and smaller series of degraded pottery, stone pendants, bone industry, animal and plant remains. They also provided more than 2000 faunal remains. Most of them are badly preserved, due to the extreme fluctuations in climate (heating and cooling and wetting and drying). However, 580 specimens could be attributed to a taxon, and more than 200 of them could be identified at the level of genus or species. They provide a clear image of the wild large mammals which lived in this area and which were hunted by the Kel'teminar people: the goitered gazelle (34%), aurochs (16%), onager (11%) and the wild camel (11%). We also find 15% of Caprini but, due to the poor preservation of the material, it was impossible to tell if they were hunted wild bezoar goats or early domesticated sheep or goat. Conversely, 13% of the specimens clearly refer to very small size bovines. This is the earliest evidence of domestic cattle in Central Asia.

This presentation will discuss the consequences of this observation in the scope of the origin of cattle husbandry between the Iranian Plateau and North China.



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Session 3: Neolithic husbandry: case studies

Suzanne Pilaar Birch¹, Canan Çakırlar², Mike Buckley³ and Amelie Scheu⁴

1. *University of Georgia; USA; sepbirch@uga.edu*

2. *University of Groningen; Groningen Institute of Archaeology; The Netherlands; c.cakirlar@rug.nl*

3. *University of Manchester; Faculty of Life Sciences; United Kingdom; m.buckley@manchester.ac.uk*

4. *Mainz University, Germany*

Herding sheep, flocking goats: Neolithic livestock mobility at the site of Ulucak, Turkey

The site of Ulucak in Western Turkey has an impressive archaeological sequence stretching from the aceramic Neolithic in the first half of the 7th millennium BC to the Byzantine period. Recent archaeozoological analyses have provided insight into the importance of animal husbandry practices and dairying throughout the Neolithic at the site. Sheep and goat were of particular significance for the subsistence economy, and cull patterns suggest an intensive management strategy that maximized herd size in the early Neolithic levels at the site (Levels VI and V) though there is no evidence for specialization. However, there is a shift in cull patterns in the later Neolithic (Level IV) that may reflect a change in herd management strategy, potentially as a result of new dairying practices, emphasis on other secondary products such as wool, or changes in the roles of pig and cattle in the diet. In order to better understand herd management strategies during this period and assess whether significant differences might be identified between sheep and goat herds, we conducted stable isotope analysis of $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ on twenty-one teeth (2nd and 3rd molars) representing 13 individuals from levels IV, V, and VI. The individuals were identified based on their morphology and the usage of ZooMS. These results provide insight into the seasonal mobility of caprines that cannot be determined from osteological data. Sub-samples were drilled from each tooth and analysed on an IRMS in the Department of Geology at Brown University (USA) to ascertain a seasonal pattern, and provided successful results, allowing for interpretation of seasonal mobility. Combined with the archaeozoological data, these results strengthen our understanding of animal exploitation strategies at this pivotal moment in time and at a critical point in landscape evolution, when herding practices were spreading across Anatolia into Europe, and Ulucak stood as a crossroads in the transition.



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Session 3: Neolithic husbandry: case studies

Bea De Cupere

Royal Belgian Institute of Natural Sciences; Belgium; bdecupere@naturalsciences.be

Hunting and herding at Neolithic Mursalevo (Bulgaria): preliminary results of the archaeozoological analysis

In the framework of construction works of the Struma motorway, connecting Sofia with Greece, rescue excavations are carried out nearby the village of Mursalevo (15 km north of Blagoevgrad, SW Bulgaria). Hereby, a very extensive area has been exposed on the border of the Struma river. A large number of houses, dated to the Early Neolithic period, have been unearthed and in certain parts of the excavated area, also Late Neolithic houses were found. Within the top layer, covering both the Early and Late Neolithic layers, Iron Age pits were removed.

Large quantities of well-preserved faunal remains have been collected during these excavations. Archaeozoological analysis has been carried out, with the aim to establish the animal species representation and to calculate the species frequencies for the most abundant taxa. Preliminary results show that subsistence of the inhabitants was mainly based on the herding of sheep but hunting also played a very important role during the Neolithic period. Other data - on ageing, skeletal part representation, sex, size and pathologies - were also recorded. These will be used to describe not only animal husbandry and the exploitation and management of the domestic animals, but also the exploitation of the wild fauna during the Early and Late Neolithic within the Struma valley. This region can be considered as a key region since it represents a connecting gateway between the vast inland and the coast.



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Session 3: Neolithic husbandry: case studies

Hans Peter Uerpmann, Margarethe Uerpmann.

Tübingen University; Germany; hans-peter-uerpmann@uni-tuebingen.de

Animal economy at Dosariyah – A Neolithic site on the east coast of Saudi Arabia



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Session 4: Species exploitation

Thursday 11th June 2015

09:00 – 09:20

Session 4: Species exploitation

Claudio Ottoni¹, Van Neer W., De Cupere B., Balasescu A., Becker C., Benecke N., Boivin N., Buitenhuis H., Chahoud J., Manaseryan N., Monchot H., Morales A., Onar V., Osypińska M., Peters J., Prendergast M., Putelat O., Spassov N., Studer J., Wierer U., Decorte R., Grange T., Geigl E.-M.

1. University of Leuven; Belgium; claudio.ottoni@med.kuleuven.be

Ancient DNA from cats - a paleogenetics perspective into past distributions and ancient human mediated translocations of *Felis silvestris*

Notwithstanding its popularity, the origin of the domestic cat still remains elusive. In contrast to livestock species, cats are solitary hunters fiercely defending their home range; they miss a hierarchical structure and are obligate carnivores, all features which make them unlikely candidates for domestication. Until recently the general belief was that the initial domestication of cats took place in ancient Egypt at least by 1,700 BC, during the Egyptian New Kingdom, an assumption mainly based on evidence from figurative art. In the 1st millennium BC the cat was associated with a local deity and its popularity reached its peak during the Ptolemaic period (332-30 BC). Recent zooarchaeological evidence suggests possible attempts of cat taming in Egypt even earlier, probably in the Predynastic period (ca. 3,700 BC). However, a complete cat skeleton found in association with a human burial dated to ~7,500 BC in Cyprus suggests that early taming of cats has arisen in the early Neolithic agricultural societies of the Near and Middle East, as a form of control over rodent populations attracted by cereal deposits.

A phylogenetic study of mtDNA and autosomal markers in modern wild and domestic cats showed that only one of the five *Felis silvestris* subspecies in the Old World contributed to the genetic pool of modern domestic cats, the Near Eastern/African distributed *F. s. libyca*. The main goal of the present study was to investigate mtDNA variations in ancient cats from Europe, Africa and the Near and Middle East, chronologically spanning from the Palaeolithic to the 18th century AD. Results gathered from a total of 197 ancient cats represents the first dataset to date of ancient *Felis silvestris* sequences, and provide clues about past distributions of this species and the trajectories of human-mediated translocations related to migrations and trades in prehistoric and historic times.



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Session 4: Species exploitation

Kamilla Pawłowska

Adam Mickiewicz University; Institute of Geology; Poznań; Poland; koka@amu.edu.pl

Time of change: Cattle in social practices of Late Neolithic Çatalhöyük

Multiple lines of evidence indicate the occurrence of social changes in Late Neolithic Çatalhöyük; here I particularly consider the cattle evidence. The social significance of cattle will be discussed through an overview of the special deposits, feasting events, burial practices, and elaboration of buildings. Evidence linking social and economic changes—especially in regards to the issue of domestication—will be provided, and shown in relation to a certain type of transformation of everyday life. These changes will be considered with respect to data from earlier levels of the occupational sequence at Çatalhöyük East.



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Session 4: Species exploitation

Angelos Hadjikoumis and Jean-Denis Vigne

Unité Mixte de Recherche 7209 ; Centre National de la Recherche Scientifique – Muséum national d'Histoire naturelle; France

A multi-site approach to sheep and goat management in prehistoric Cyprus: Synthesis and New Insights

Sheep and goat have played a varying, depending on period and site, but diachronically important role in the nutrition and other aspects of human societies in Cyprus. Their interactions with humans have not received specialized research attention until quite recently. This presentation is based on a study of sheep and goat remains from a large number of sites in order to further our understanding of the role they played in prehistoric Cyprus. Besides providing an overview of prehistoric faunal assemblages with a focus on sheep and goat, this study also fulfills several other aims. Faunal assemblages are compared in terms of their caprine component, with an improved degree of comparability ensured through recording of data by the same person and the application of the same recording protocol to all assemblages. Among other analyses, the frequencies of caprines against other taxa, the proportions of sheep to goat, newly constructed mortality profiles and sex ratios of sheep/goat populations are employed to achieve diachronic interpretations of interactions of the two caprines with humans in prehistoric Cyprus. In addition, the results of zooarchaeological analyses are integrated with those based on extensive relevant ethnozoarchaeological data collected in Cyprus.

These new results shed light in the establishment of sheep and goat populations in Cyprus and the consolidation of their domestic status over the Aceramic Neolithic, the deceleration and relaxation of management pressures in subsequent millennia as well as the intensification that occurred in the subsequent Bronze Age. The results also highlight that in parallel with overall trends, finer chronological and geographical inferences are possible, even for a relatively small area such as Cyprus.



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Session 4: Species exploitation

Benjamin S. Arbuckle

University of North Carolina at Chapel Hill; USA; bsarbu@email.unc.edu

Exploring traditions of equid exploitation in pre- and protohistoric Anatolia

In this paper I present ongoing research focused on reconstructing the long history of equid exploitation in early and middle Holocene Anatolia. I address current archaeological and zooarchaeological evidence for traditions of hunting of wild hemionids and horses in the region as well as their eventual extirpation. In addition, the major problems of the timing of and mechanisms responsible for the appearance of domestic horses and donkeys in Anatolia are addressed. Finally, emphasis is placed on the difficulties involved in understanding equids in the archaeological record as well as potential for future work on this important topic.



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Session 4: Species exploitation

Jill Goulder

University College London; United Kingdom; jill@jgoulder.com

Invisible donkeys (and cows) in the Ancient Near East: New archaeological insights into the early systematic use of working animals, using modern studies in developing countries

The working donkey is difficult to detect in Ancient Near Eastern prehistory through faunal analysis. ANE archaeology has tended until recently to be settlement-based, and faunal remains are therefore mainly related to food. It can be tricky to tell donkeys from hemionids, and domesticated equids from wild; also zooarchaeological emphasis to date has tended to be on the donkey's initial domestication, or on its hybridisation with wild hemionids. Perhaps consequently, there is a lack of emphasis on the donkey in wider ANE archaeological investigation and interpretation. Discussion of the early use of working animals for ploughing commonly appears based on Western European medieval models of semi-industrialised temperate-zone clay agriculture, featuring oxen. Until recently there has been very little mention of working donkeys (or cows) in archaeological literature of the region, either for ploughing or as contributory transport factors to the explosion of trade and urbanisation. A new contributory approach to ANE zooarchaeological studies is proposed, using analogies with modern African and other studies to help detect systematic usage of donkeys and cows in the ANE, for ploughing and for the key work of local transportation, through tracing consequent social and economic changes in the cultures of the time. In some African regions there has been a direct recent transfer from hoe agriculture and human portage to use of working animals; there is a huge body of recent published studies of these regions on the adoption and social/economic impact of working animals. A new picture – often of donkeys and cows ploughing – emerges from studies of adoption of working animals in regions featuring arid, sandy soils unsuitable for deep ploughing. This new material offers the opportunity (with careful caveats) to study uptake processes and problems and to draw tentative interpretations relating to working animal use in the 4th and 3rd millennia in the Near East.



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Session 4: Species exploitation

Joris Peters^{1,2}, Ferdinand Neuberger^{1,3}, Michaela Zimmermann¹, Gisela Grupe^{2,3}, Hylke Buitenhuis⁴ and Nadja Pöllath¹

1. *ArchaeoBioCenter and Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München; Munich; Germany; joris.peters@lmu.de*

2. *SNSB, Staatssammlung für Anthropologie und Paläoanatomie; Munich; Germany*

3. *Department I, Fakultät Biologie, Ludwig-Maximilians-Universität München, Germany.*

4. *Groningen Institute of Archaeology, University of Groningen; the Netherlands*

Baselines generated with faunas from 11th-10th millennia cal. BC sites in Anatolia are prerequisite to documenting the transition from hunting to herding caprines

The last decade witnessed the publication of several key papers relative to scenarios of how hunting developed into herding. Whereas the value of theoretical considerations for explaining the transition from wild to domestic animals should not be underestimated, scenarios often suffer from limitations relative to their practicability in the respective ecogeographical settings. In addition, models based on them can lack explanatory power since the zooarchaeological record does not allow verifying some essential premises. Since the late 1960s, zooarchaeologists have used baselines for documenting changes related to caprine domestication, the first and foremost being bone size. It can be agreed, though, that morphological and genetic change will be delayed if founder flocks continue reproducing with their wild relatives. Conceivably, stronger cases could be made in the future by generating baselines with wild caprine populations and by considering multiple parameters (size, sex, age, diet, health). This approach is illustrated using caprine remains from Anatolian sites dating between the 11th and 8th millennium cal BC.



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Session 4: Species exploitation

Daniel E. Bar-Yosef Mayer¹, Marder Ofer², Omry Barzilai³, Israel Hershkovitz¹ and José-Miguel Tejero

1. Tel Aviv University; Israel; baryosef@post.tau.ac.il

2. Ben Gurion University of the Negev; Israel

3. Israel Antiquities Authority; Israel

4. Centre national de la recherche scientifique; Archéologies et Sciences de l'Antiquité

Shell beads and shellfish at Upper Palaeolithic Manot Cave, Israel

The Upper Palaeolithic cave site of Manot, western Galilee, Israel is a closed and active karstic cave, which was sealed shortly after its UP occupation. The occupation was radiocarbon and U-Th dated to ca. 30-40 ka BP. The Early Upper Palaeolithic contains a lithic industry with nosed and carinated items, retouched bladelets ('Dufour') and el-Wad points. Bone artifacts include bi-points made of antler and shell beads include perforated *Nassarius gibbosulus*, *Columbella rustica* and *Antalis spp.* as well as two cowrie beads found in association with human bones. In addition to shell beads, edible molluscs are also present: *Patella caerulea* were collected on rocky shores of the Mediterranean and Levantine land snails were found as a shell midden. The sum of these finds points to a strong Aurignacian affinity.



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Session 4: Species exploitation

Arati Deshpande-Mukherjee

Deccan College Post graduate and Research Institute; India; adm.muk@gmail.com

Fresh New Insights into Harappan shell working from the Kachchh region of Gujarat India.

The Gujarat region with its three distinct parts Kachchh, North Gujarat and Saurashtra has yielded numerous sites belonging to different phases of the Harappan civilisation. At most sites datable between 2500 BC. to 1900 BC. , shell fragments of the two large marine gastropods *Turbinella pyrum* and *C. ramosus* have been recovered. Their presence along with finished objects strongly suggests shell working activity during the Harappan period in this region. This will have involved the manufacture of a variety of shell objects such as bangles, beads, inlays, etc. So far shell studies have been carried out mostly for sites located in North Gujarat or the Saurashtra peninsula. These include sites like Bagasra, Kuntasi, Nageshwar and Nagwada where the shell industry was mostly geared for local markets.

In this respect shell studies for sites from the Kachchh region in particular have been limited. This part of Gujarat is very important due to its strategic location between the Sindh region in the north and the Saurashtra peninsula in the south. Some very large fortified sites like Dholavira, Surkotada, Kanmer and Junikuran, which have been excavated share similarities with major Harappan sites such as Mohenjodaro and Harappa. These sites have yielded very rich evidence for shell working. Hence in this paper the recent shell studies carried out for some of them are discussed. The studies have yielded insight into various aspects related to shell working in this region. It is revealed that these sites have functioned as important shell working centers carrying out production on a very large scale. Some, like Dholavira, may have been involved in long distance trade of shell objects with sites in Mesopotamia. Also an attempt has been made to find out if shell working in this area differed in any way from that carried outside the Kachchh region.



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Session 5: Animal products

Thursday 11th June 2015

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Session 5: Animal products

Elizabeth R. Arnold¹, Haskel Greenfield² and Aren Maeir³

1. *Grand Valley State University; USA; arnoledi@gvsu.edu*

2. *University of Manitoba; Canada*

3. *Bar-Ilan University; Israel*

An examination of economic specialization in the Early Bronze Age city of Tell es-Safi using isotopic analysis of domestic animals

Early urban economies associated with the appearance of city-states during the Early Bronze Age of the southern Levant are often treated as if they relied upon locally-available food resources for the bulk of their foods that were largely produced at the household level, such as the herding of domestic livestock around the periphery or territory of the city-state. In this paper, we investigate whether the pastoral component of economies was a small-scale local affair or was conducted remotely, which would have involved productive specialists such as nomadic pastoralists, through the analysis of carbon, oxygen and strontium isotope samples of ovicaprine and donkey dental remains from the Early Bronze Age deposits of Tell-es Safi/Gath, Israel. The isotope analysis enables a reconstruction of the life history, diet, mobility, seasonality of movement and management practices of these domestic animals. The data are suggestive of spatial separation of animals from the settlement as the results indicate that the animals were reared at a substantial distance from the site and only brought into the local territory immediately prior to slaughtering. In addition, variability in the oxygen isotope data of the ovicaprines indicates contrasting seasonality suggesting variable herd management patterns across the region. Based on these data, we argue that pastoral production was a specialised feature of early urban economies in the southern Levant since it occurred far away from the cities. This would have required a level of economic scale and organisation involving productive specialists that was far beyond that necessary for more localised herding patterns. It suggests that food production within early cities was not based on local holdings or small-scale herds by family units. Instead, it appears likely that there was a separate pastoral component conducted by specialists at a great distance from the settlement.



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Session 5: Animal products

Ninna Manaseryan

*Scientific Center of Zoology and Hydroecology; National Academy of Sciences of the Republic of Armenia;
Republic of Armenia; ninna_man@yahoo.com*

Archaeozoological investigation of the site of Shengavit, Armenia

The site of Shengavit lies in the Ararat Plain within the city of Yerevan. The exploration of Shengavit by the archaeologists began in 1936 (E. Bayburdyan, S. Sardaryan, and H. Simonyan). The cultural layers of Shengavit settlement built up during more than two thousand years and they have about 4 meters depth. The monument is dated at the beginning of the 4th -2nd millennium BC.

Faunal remains (1965-1980 excavated by G. Sardaryan; 2003-2007 excavated by H. Simonyan) from the site were delivered to the Institute of Zoology of the Armenian National Academy of Sciences for archaeozoological examination.

The result of the analysis of 3646 identifiable bone fragments show that 92.5% of them belong to domestic animals and 7.4% to wild animals. Among the domestic faunal assemblages from settlement, cattle bone fragments are predominant, while in the burials, the most common domestic animal bone belongs to horses. Red deer bones represent the majority of wild animal bones. Detailed examination of the material reveals: 1) the faunal composition of the region and the osteometric characteristics of the animal bones during that time period, 2) the successful livestock breeding and hunting abilities of the site's inhabitants.



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Session 5: Animal products

Emmanuelle Vila¹ and Jwana Chahoud^{1,2}

1. CNRS/UMR 5133 Archeorient; Lyon ; France ; emmanuelle.vila@mom.fr

2. Lebanese University; Beirut; Lebanon

The development of sheep breeds in northern Mesopotamia and the Levant during the third millennium BC

At the beginning of the development of cities in ancient Mesopotamia (Iraq, northern Syria) and in the Levant around the end of the 4th millennium BC and until the 3rd millennium BC, ovicaprine remains dominated the archaeological fauna. The development of livestock production was certainly induced in response to the socio-economic growth associated with the urbanization process. The increasing demand for meat and textiles has led to the development of wool production based on the exploitation of small sized breed of sheep with a woolly fleece according to morphometrical analyses. Morphometrical data and their contribution to the identification of sheep breeds along with the question of the origins and expansion of a woolly sheep breed are discussed in the paper.



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Session 5: Animal products

Christian Küchelmann

Topoi Excellencecluster Berlin; Knochenarbeit; Germany; info@knochenarbeit.de

The fleas cling to the golden fleece... – A large scale analysis of domestic sheep related archaeozoological data in Central Europe and the Near East from the 7th-2nd millennium BC

This research project is devoted to the shift from hair sheep to wool sheep, and the spread of this development as the basis for a targeted use of wool in prehistoric times. Archaeozoological data on domestic sheep and their context from settlement sites in Southeastern Europe and the Near East has been collected in a structured database since 2013. The database presently contains data of 252 sites in Southeastern Europe. The recording of sites in the Near East has begun recently and will finally comprise data of ca. 20-30 sites with long lasting habitation sequences and high amounts of analysed animal remains.

The analysis is based mainly on data of domestic species composition, osteometric variation and age and sex profiles of sheep. It is thus not a new approach but, as far as I know, it has never been applied to such a wide geographical and chronological range. Previously published approaches will be taken into account and evaluated from a broad perspective. Further, the archaeozoological research is embedded in a research group of two archaeologists, a geoarchaeologist and a linguist, who are analyzing artifacts related with textile production, iconographical and written evidence for wool production and use as well as landscape changes related to grazing. In my presentation I would like to show the first results of the evaluation of the data assembled so far.



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Lightning and poster session

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15:10 – 17:30

Lightning and poster session

Marjan Mashkour and Vera Eisenmann

UMR 7209 Archaeozoology; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr

Late Pleistocene to mid Holocene Equids on the Iranian Plateau. What news?

A considerable number of archaeozoological investigations in Iran during the last two decades have made new osteological material available which provides novel information on ancient faunal diversity of the Iranian Plateau. In this poster, we will focus on presenting equid diversity in this part of the world.



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Lightning and poster session

Shiva Sheikhi^{1,2} and Marjan Mashkour²

1. Paris IV- Pantheon- Sorbonne; France; shiva_sheikhi1@yahoo.com

2. UMR 7209 Archaeozoology; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr

Evolution of pastoralism in South-West of Iran from the 6th to 3rd millennium BC

The foundation of urban societies in the Middle East is a principal question for archaeologists working in this region. In parallel to these important socio-economic changes mobile pastoralist and nomadic communities have acted as an important component of Near-Eastern societies. Archaeologists believe that nomadism has ancient origins, evidenced mainly through indirect evidence and interaction of nomadic and sedentary people seems to be a major characteristic of Middle-Eastern societies. This paper will focus on the archaeozoological assemblages of several sites from Khuzistan, Ilam and Fars provinces that span from the 6th to the 3rd mill. BC. However, while various subsistence patterns are observed in those sites, the three main domesticates of the region, sheep, goat and cattle constitute the base of the animal exploitation. Besides the classical archaeozoological analyses of these pastoral economies, on the basis of 26000 bones from 5 sites and 10 chrono-cultural assemblages, we have initiated a large isotopic program in order to document herd mobility more accurately. These two combined approaches will allow a higher resolution for analyzing the complexity of pastoral practices, directly linked to the environmental conditions, geographical setting of sites and possibilities of land use.



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Safoora Kamjan¹, Marjan Mashkour², Fatemeh Azadeh Mohaseb² and Hossein Azizi Kharanaghi³

1. Middle East Technical University; Ankara; Turkey; safoora.komijani@gmail.com

2. UMR 7209 Archaeozoology; Sorbonne Universités; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr; azadeh.mohaseb@mnhn.fr

3. Iranian Cultural Heritage Handicraft and Tourism Organisation; hussinazizi@yahoo.com

Animal remains of the Neolithic village of Qasr-e Ahmad, Fars Province, Iran

Qasr-e Ahmad, Kavar, is located in South-western Iran in Fars, near the Qara Aqhaj valley at 60 km South of Shiraz and 30 km North of Firuzabad. In 2003 a survey was conducted by Kamyar Abdi and Reinhard Bernbeck for further archaeological investigations. A radio carbon dating of a sheep bone from this operation supported by M. Mashkour indicated that the site dates to the Early Neolithic period. In 2011, the site was finally excavated by Hossein Azizi Kharanaghi (ICHHTO- Iran).

Qasr e Ahmad is a Pre-pottery Neolithic to Pottery Neolithic site. The analysis of the faunal remains was performed at the Archaeometry Laboratory of Tehran University under the supervision of MM and AFM. This site is important for providing the evidence for the earliest phases of the Neolithic occupation in South-West of Iran.

Approximately 7000 animal bones were studied out of which 40% were identified to the level of family, genus or species. The bulk of the remains belongs to the PN levels. In both phases caprines dominate the assemblages while the most common species is goat (*Capra hircus*). Hunted species are represented by gazelle (*Gazella subgutturosa*), boar (*Sus scrofa*), hare (*Lepus capensis*), turtle (*Testudo cf graeca*) and birds. Bones and teeth were generally well preserved here and demographic and metric analysis could be performed for main ungulates. This study contributes to a better understanding of the status of sheep (*Ovis*) and cattle (*Bos*), obviously still in their initial steps of domestication. As for goat, the animal is already present in Qasr e Ahmad in its domestic state from the beginning of the sequence.



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S. Davoudi¹, Marjan Mashkour² and Akbara Abedi³

1. Department of Archaeology; Tarbiat Modares University; Tehran; Iran; davoudih1@gmail.com

2. UMR 7209 Archaeozoology; Sorbonne Universités; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr

3. Department of Archaeology; University of Tehran; Iran; akbarabede@gmail.com

Subsistence economy at Kul Tepe (North-Western Iran) from Early Chalcolithic to the Early Bronze Age.

The site of Kul Tepe is located near the city of Hadishahr 10 km to the south of the Araxes River in western Azerbaijan (Iran). Excavations were carried out by A. Abedi and H. Khatib Shahidi in 2010, the cultural material including the animal bones belongs to the Early Chalcolithic, to Late Bronze Age, Iron III, and Achaemenid periods. The faunal remains are very well preserved and cover a period from Early Chalcolithic to Early Bronze Age (5000 to 2200 BC) providing a continuous record for animal exploitation at the site. The faunal study was conducted in the archaeozoology laboratory of the University of Tehran. A wide range of domestic and wild animals are present in the faunal remains. domestic sheep, goat, and cattle are dominant as the main animal resource in all periods, with an increase of cattle proportions during the Kura-Araxes 1 period. Also a rather important number of hunted species, cervids, gazelle, wild goat, sheep and bovids are present in this collection, especially during the Late Chalcolithic and Kura-Araxes 1 (4400-3200 BC). Also equid remains were found among the bones. Horse remains are present in the Kura-Araxes 1 levels and Early Bronze Age (3600-2200 BC). The quasi absence of suid remains is outstanding here. The study of Kul Tepe faunal remains brings a set of novel data for this region and this period and provides a continuous picture of the subsistence economy from the fifth to the third millennium BC, including three important prehistoric cultural transitions. The strategic location of site at the cross roads of major routes linking the Iranian Plateau to Anatolia and the Caucasus to Northern Mesopotamia suggests relations and interactions between human communities of these areas, and makes it possible to compare the results with other contemporaneous sites.



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Fatemeh Azadeh Mohaseb¹, Marjan Mashkour¹ and Behzad Mofidi²

1. UMR 7209 Archaeozoology; Natural History Museum of Paris; Centre national de la recherche scientifique; France; azadeh_mohaseb@yahoo.com; mashkour@mnhn.fr

2. University of Mainz; Mainz; Germany

Animal exploitation during the Middle Elamite period based on the faunal remains of Haft Tappeh (Khuzestan, Iran)

Haft Tappeh, one of the most important Elamite sites in Khuzestan, shows the important potential of the understanding of animal exploitation within an urban site in southwestern Iran. Fortunately, the consciousness about the importance of the archaeozoological material for paleoeconomic reconstructions has resulted in the quasi systematic recovery of faunal remains in Iran, even in historical times. The abundance of domestic herbivores such as caprines, equids and bovines and the minority of hunting are remarkable. The most exploited domesticates are the caprines and the number of goats is twice more than the amount of sheep. The analysis of equid cranial and postcranial bones revealed the presence of donkeys and hybrids and no clearly horse remains. Although the presence of domestic buffalo is highly expected in this part of Iran, there were no remains which could be allocated to this species among the bovine bones. Gazelles, roaming in the arid environment of the site, seem to be the main hunted animal. Despite the abundance of many important rivers in the proximity of the site and the Persian Gulf, there were a few fish bones and shells among the osteoarchaeological remains. The exceptional finding of a rather complete elephant skeleton, which was related to the craft activities in the site, is unfortunately very poorly documented. However, this anecdotal and spectacular find did not learn about the everyday life and the economic aspect of animal consumption during this historical period.



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Solmaz Amiri¹, Marjan Mashkour², Fatemeh Azadeh Mohaseb² and Reza Naseri²

1. Tehran University; Faculty of Literature and Humanities; Iran; amiri.solmaz.25@gmail.com

2. UMR 7209 Archaeozoology; Sorbonne Universités; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr; azadeh.mohaseb@mnhn.fr; r.nasery@gmail.com

A glance into the subsistence economy of Gunespan-e Patappeh (Hamedan, Iran) during the Middle Bronze Age and Median Periods.

Gunespan-e Patappeh is located in southeast of Malayer, in Hamadan Province. The site is represented by a sequence covering the Middle and Late Bronze Age, to the Islamic period. However the main occupation addresses of the Bronze Age and Late Iron Age (Median) periods. Six seasons of excavations in the site evidence close similarities to other Median architecture at nearby Godin, Nush-i Jan and Baba Jan sites.

Archaeozoological assemblages from these periods in this part of Iran are scarce and limited to the studies by A. Gilbert and S. Bökönyi on above mentioned sites. The small faunal assemblage recovered at Gunespan (941 remains) adds to our knowledge of the Bronze and Iron Age subsistence economies of central Zagros. The analysis of the faunal remains was performed at the Archaeometry Laboratory of Tehran University under the supervision of MM and AFM. Sheep/goat and cattle constitute the bulk of the exploited animal resources. During the Bronze Age, osteological pathologies observed on cattle bones indicate also their use as drought animals. The identified wild species (12%), the majority of which are herbivores, belong to wild sheep (*Ovis orientalis*) and wild goat (*Capra aegagrus*), red deer or Persian fallow deer (*Cervus elaphus/ Dama mesopotamica*), boar (*Sus scrofa*) and finally gazelle (*Gazella subgutturosa*). Also present are the wild cat (*Felis silvestris*), hare (*Lepus europaeus*) and tortoise (*Testudo graeca*). Equid bones are still under investigation. At this point the presence of donkey (*Equus asinus*) and horse (*E. caballus*) could be evidenced.



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S. Beizazee Doost¹, Marjan Mashkour², Fatemeh Azadeh Mohaseb² and Mohammad T. Atayi³

1. Islamic Azad University (Central Tehran branch); Iran; san_arch83@yahoo.com

2. UMR 7209 Archaeozoology; Sorbonne Universités; Natural History Museum of Paris; Centre national de la recherche scientifique; France; mashkour@mnhn.fr; azadeh.mohaseb@mnhn.fr

3. Institut für Vorderasiatische Archäologie; Ludwig-Maximilians-Universität München; Munich; Germany; mohammad.t.atayi@gmail.com

Subsistence Economy of Tepe Qasrdasht (Fars-Iran) during the Iron Age.

Tepe Qasrdasht is located in the Kamin plain near Pasargadae. It was excavated in 2011 under direction of Mohammad Taghi Atayi in order to investigate the chronological sequence before the Achaemenid settlement. According to the cultural material discovered at the site three main chronological periods are defined in Qasrdasht: pre-Achaemenid (Iron Age III), Achaemenid /post-Achaemenid and Sassanid. The archaeozoological documentation is very scarce for this area and in particular for the historical periods. Approximately 2000 animal bones were recovered at Tepe Qasrdasht from the pre-Achaemenid (Iron Age III), this is the best represented period, and also from the other above-mentioned periods. Domesticates, including sheep/goat (84.3%) and cattle (8.4%) were the major source of animal exploitation in Qasrdasht; It should be noted that goats outnumber sheep in this site. Equids, including donkey (*Equus asinus*; 0.8%), were also identified in this assemblage. Milk, wool and hair exploitation of sheep and goat is evidenced through the kill-off patterns. Boar (*Sus scrofa*) and gazelle (*Gazella subgutturosa*) bones are present in the assemblage; however, hunting, represented by 2.9% of the remains, was a marginal activity in the economic life of Qasrdasht during the pre-Achaemenid period (Iron Age III). Carnivores, mainly dog (*Canis familiaris*) 1.4% and bird (unidentified; 0.4%) bones were also identified.

According to these results it can be stated that Qasrdasht rural communities were highly specialized in pastoral activities. A question that should be investigated in the future and with more contemporaneous data from this region is how these communities exploited their environment and landscape, how herding interacted with agricultural activities and finally how people moved seasonally their herds to altitudinal pasture lands. These are questions that can further be investigated through various approaches including archaeobotanical analyses as well as stable isotope analyses of sheep/goat and cattle.



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Canan Çakirlar

University of Groningen; Groningen Institute of Archaeology; The Netherlands; c.cakirlar@rug.nl

Rooting in a new niche: Neolithic human-suid interactions at the Gates of Europe

The domestication of Old World farm animals in Early Holocene is often perceived as a process that took place exclusively in the extended Fertile Crescent. In this framework, regions neighboring the Fertile Crescent, especially in the west, are mere receivers of domesticated farm animals imported by spreading farmers originating from the Fertile Crescent. In this poster and presentation, I discuss initial results of ongoing research on suid remains from 7th millennium BC contexts in western Turkey and Bulgaria that compel us to consider models outside this framework.



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Jwana Chahoud

1. *Archéorient*; CNRS/UMR 5133 ; Lyon ; France Jwanachahoud@gmail.com

2. *Natural History Museum*; *Lebanese University*, Beirut

New data from Neolithic sites in Lebanon

Recent excavation from late Neolithic sites from Lebanon revealed new data regarding the subsistence economy of PPNB societies of the coastal and hinterland settlements. Rescue excavation at Beirut and at Labwe (Northern Beqaa) provided new set of faunal data. Domestic sheep, goats, pigs and cattle are the main used animals. Hunting activities are less prominent with wild Caprinae, wild boar and cervid among the prey hunted along with birds and fish species on the coastal site, gazelles and hares on the hinterland site. The environment and geographic position of the site influence the choice of husbandry practice whereas cattle seems to be the dominant species for breeding on coastal site and Caprinae at hinterland. Preliminary results are discussed in this paper.



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Rémi Berthon

CNRS - UMR 5133 ; Lyon ; France ; rberthon@yahoo.fr

A specialised pastoral system focused on Caprinae during the Chalcolithic in the Araxes Valley (South Caucasus): A view from Ovçular Tepesi (Azerbaijan)

This communication will present new results from the zooarchaeological analyses carried out at Ovçular Tepesi, a Chalcolithic and Early Bronze Age settlement located in the Nakhchivan Autonomous Republic (Azerbaijan) in South Caucasus. Focus will be put on the definition of the pastoral system (i.e. the exploitation of domestic ungulates) and on the evolution of the later during the ca. 300 years of occupation of the settlement. The pastoral system will be discussed in the frame of the cultural development which occurred during the 5th and early 4th millennia in South Caucasus.



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Bea De Cupere¹ and Elena Marinova²

1. Royal Belgian Institute of Natural Sciences; Brussels; Belgium; bdecupere@naturalsciences.be

2. Center for Archaeological Sciences; University of Leuven; Leuven; Belgium

Food provisioning at Hacilar BH during the Early Bronze Age: preliminary results of the archaeozoological and archaeobotanical analyses

Hacilar Büyük Höyük (BH) is situated in the Burdur plain (SW Anatolia) at about 500m north of the well-known Neolithic site of Hacilar, excavated by James Mellaart in the fifties. Excavations at this mound started in 2011, under the directorship of Gülsün Umurtak and Refik Duru (Istanbul University) and revealed the presence of a large Early Bronze Age settlement surrounded by an impressive defense system consisting of small adjacent rooms. The quality and variety of the pottery and other archaeological artefacts show the wealth of the inhabitants.

Faunal and macrobotanical assemblages dated to the EBA I (3010-2890 cal BC) and EBA II have been recovered so far and are subjected to study in order to better understand the organisation of the food provisioning of this site. Preliminary results of the archaeozoological analysis show the importance of herding sheep/goat and cattle, and to a lesser extent the breeding of pigs. In addition, valuable data on ageing and osteometry were collected, which are being used to reconstruct exploitation patterns of these domesticates. Macrobotanical results than again illustrate the use of the plant resources. The comparison of these data with those of contemporary sites will allow to better understand the food economies during the Early Bronze Age within this region.



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Lightning and poster session

Alice Berger

University College London; London; United Kingdom; aliceberger.12@ucl.ac.uk

Exploring urban economy in Early Bronze Age Tel Beit Yerah

Tel Beit Yerah, situated on what used to be a peninsula on the southern shore of Lake Kinneret, Israel, seems to have played a central role in the development and demise of urban lifestyle in the Southern Levant during the third millennium B.C. As one of just few continuously occupied settlements of that period, it permits investigation of economic and social changes associated with the development of complex societies.

Previous research has demonstrated that Tel Beit Yerah developed organically from a small village to one of the largest settlements in the region, while forming international connections as far as the Egyptian royalty. Nonetheless, it is still debatable whether the economic prosperity and social complexity exhibited at this site, and at others of similar magnitude, is truly reflective of a full-fledged urban society situated in a regional economic system, or is merely formed of well organized, autarkical, large villages.

It is hoped that detailed investigations of subsistence economy at Tel Beit Yerah could shed light on the economic organization of the settlement and its surroundings. Given the continuity of occupation, which permits a diachronic examination of the southern Levantine society during the Early Bronze Age, and its exceptional size, which hints to its potential role as an urban center, it is taken as a case study to represent the full sequence of proposed urban development in the region. Hereby the research project would be presented, with preliminary results of the investigation of faunal remains from the site.



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Sarah E. Adcock and Benjamin S. Arbuckle

1. *University of Chicago; Chicago; USA; adcock@uchicago.edu*

2. *University of North Carolina at Chapel Hill; USA*

Animal Economies in Middle Bronze Age Central Anatolia

In this paper, we use faunal evidence from the sites of Acemhöyük, Boğazköy (Hattuša), and Çadır Höyük to shed light on animal economies during the Middle Bronze Age in central Anatolia. During this time which coincides with the Old Assyrian Trading Colony period, major Bronze Age centers like Acem and Boğazköy were heavily involved in both local and international trade. Here we focus on characterizing local interactions by studying the use of animals and their products on the plateau. Specifically, we compare provisioning practices at two major centers (Acem and Boğazköy) with that of a small town (Çadır). By studying the production and distribution of antemortem and postmortem animal resources at these sites, we consider the relationships between urban centers and hinterland sites as well as those between the state and rural pastoralist producers.



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Youri van den Hurk and Canan Çakirlar

University of Groningen; Groningen Institute of Archaeology; the Netherlands; yourivandenhurk@gmail.com; c.cakirlar@rug.nl

Interpreting the zooarchaeological remains from an intact kitchen context from Middle Bronze Age Alalakh: Palace, redistribution and feasts.

Bronze Age palaces in the eastern Mediterranean are thought to have been stages of feasting and redistribution. Textual and pictorial records indicate that both game acquired through 'royal hunting' as well as meat from domesticated mammals brought by subjects as tributes featured as palatial food. Often, zooarchaeology contributes to the study of palatial economies and the role of prestige in managing it, but since feasts show great variability in form there is no simple archaeological signature for identifying feasts.

Recent excavations at Middle Bronze Age Alalakh in southern Turkey have uncovered an impressive intact kitchen complex within the palace at the site, at which zooarchaeological material has also been uncovered. This material provides the unique opportunity to study the foodways at a clear elite Bronze Age context. By examining the zooarchaeological material and look at species compositions, age stages and body part distributions of the species it is possible to test whether the textual and pictorial records are accurate and that at this palace feasting, royal hunting and tribute making by the subjects was undertaken.



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Julie Daujat¹, Marjan Mashkour¹, Karine Debue¹, Shiva Sheikhi¹, Solmaz Amiri², Johanna Lhuillier³ and Julio Bendezu-Sarmiento^{4,5}

1. UMR 7209: Archéozoologie, archéobotanique : Sociétés, pratiques et environnement (CNRS-MNHN) Paris; France ; juliedaujat@gmail.com

2. Department of Archaeology; University of Tehran; Tehran; Iran.

3. UMR 8546: Archéologie et Philologie d'Orient et d'Occident (Aoroc, CNRS-ENS) Paris; France

4. Délégation d'Archéologie Française en Afghanistan (DAFA); Kabul ; Afghanistan

5. UMR 7041: Archéologie et Sciences de l'Antiquité (ArScAn, CNRS); Nanterre; France

Animal exploitation during the Iron Age at Ulug Depe, a large proto-urban site in eastern Turkmenistan

Ulug Depe is one of the most imposing proto-urban sites of Central Asia. The long chronological sequence stretches from the Middle Chalcolithic to the pre-Achaemenid period, although the occupation is first attested in the Late Neolithic. The site is excavated by a French-Turkmen archaeological expedition since 2001, following other previous archaeological investigations by Russian teams.

Several thousands of animal bones were studied from twelve seasons of excavation and have provided an important set of information on agropastoralism, hunting practices as well as other aspects of daily life. In this work we will present the faunal remains from the Iron Age contexts, locally known as the Yaz period. The faunal spectrum is relatively diversified with a dominance of Caprini followed by cattle. Wild fauna is in majority represented by *Gazella* and *E. hemionus*. Equid remains also attest to the presence of horse and donkey.

Archaeozoological investigations in this part of Central Asia are still scarce and many questions related to the exploitation of animals are not well known. Ulug Depe faunal material is among one of the best documented available assemblages that provides a large set of information on the environmental setting of the site, caprine herding strategies and the use of animal remains in the production of objects.

One of the important issues currently in Central Asia is to understand how the steppe was used in terms of animal management and its relation with agriculture.



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Elizabeth Farebrother

*Institute of Archaeology; University College London; London; United Kingdom;
elizabeth.farebrother.13@ucl.ac.uk*

Prehistoric human-animal interactions of the Shahrizor Plain, Iraqi Kurdistan

Whilst a wealth of zooarchaeological understanding has been documented from the analysis of animal bone assemblages from the Levant and Central Anatolia, the Eastern Fertile Crescent has remained understudied. The sites of Tepe Marani and Gurga Chiya lie adjacent to one another, and form the core of a joint excavation project by UCL, UCL Qatar and the Sulaimaniyah Directorate of Antiquities and Heritage. Located 7km west of Halabjah, Iraqi Kurdistan, both sites have yielded animal bone assemblages, together spanning a chronological sequence from Halaf to Uruk.

This research aims to redress this knowledge gap through the introduction of two new sites to our understanding of the Shahrizor Plain, alongside local and regional contextualisation of the resulting zooarchaeological data. Preliminary results from the 2013 and 2014 field seasons will be presented and discussed, placing an emphasis on butchery and taphonomic alteration of the animal bone assemblages. In particular, the human modification of animal bones material (e.g. burning, consumption and deposition) will be compared and contrasted in order to shed new light onto changes in human attitudes towards animals from post-domestication early village life to state formation.



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Anja Prust

German Archaeological Institute; Berlin; Germany; anja.prust@gmail.com

The sheep, the goat, the camel and the cowry – Animal exploitation in ancient Tayma (Saudi-Arabia)

The ancient Tayma, located alongside the renowned Incense Road, was one of the major economic, political and cultural centres in the northwest of the Arabian Peninsula. Since the beginning of a multidisciplinary joint-project – started in 2004 and conducted by the German Archaeological Institute Berlin (Orient-Department) and the Saudi Commission for Tourism and Antiquities – phases of occupation were identified lasting from Middle Bronze Age to Islamic period. Next to its function as residence for a sedentary society, the oasis settlement conducted as station for pastoral nomads and caravans as well as a transshipment point for traded goods from Syro-Mesopotamia, Egypt and the Levant.

The analyses of faunal assemblages from public and representative areas as well as from residential quarters from Early Iron Age to Late Antiquity enable first comments on the local exploitation of animals and animal products. Of course, the entire material is composed of remains of sheep and goat, but undoubtedly, the domestication of dromedary plays a prominent role in investigating ancient livestock economies. While in early assemblages the amount of camel remains is quite rare, the high economic importance of this animal is evident in later periods, particularly for the increasing long-distance trade. Thus, the occurrence of domestic dromedaries in the northwestern Arabian Peninsula may be roughly ascertained. The apparently minor exploitation of wild animals as additional source of food allows cautiously inferences concerning local environmental conditions and an elaborate animal husbandry. Noteworthy are remains of molluscs as well as artificially modified objects made of ostrich egg shells found in a representative building dating back to the Early Iron Age. The lecture will present the preliminary research results referring to local animal exploitation in an Arabian oasis settlement focusing assemblages from the 12th century BC to the 6th century AD.



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Nora Yengibaryan¹ and Nina Manaseryan²

1. Institute of Archaeology and Ethnography; National Academy of Sciences of the Republic of Armenia; Republic of Armenia; ninna_man@yahoo.com

2. Scientific Center of Zoology and Hydroecology; National Academy of Sciences of the Republic of Armenia; Republic of Armenia

Knucklebones of ancient Armenia

During the excavations of the different period (from EB to Medieval) numerous knucklebones worked by humans have been found. Generally these are from sheep and goats (*Ovis aries /Capra hircus*), but also several cattle (*Bos taurus*) have been identified. The excavated knucklebones were used as amulets and were used for games. The unmodified knucklebones are coming from the remains of the funeral meals and also we can find dozens of unmodified playing knucklebones inside the burials. Among these there are some painted examples. According to Ethnographical materials some Armenian knucklebone games have been played with the painted ones. The next type of the playing samples is weighted with metal (the knucklebone has been filled with lead or tin).

The separate group is the knucklebones with one or more smoothed sides. In Armenian national knucklebone playing all the sides have had their own names. The smoothed knucklebones have been used also for the magic rituals. The perceptible group of knucklebones found from tomb excavations is the amulets with the holes done on central, longitudinal parts and by sides. The remains of hanging bronze or iron rings have preserved inside some of that holes. By the beliefs of our predecessors the amulet-knucklebones have protected against the “bad eye” and failure. It has considered bringing the luck and prosperity.



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Nina Manaseryan

*Scientific Center of Zoology and Hydroecology; National Academy of Sciences of the Republic of Armenia;
Republic of Armenia; ninna_man@yahoo.com*

Armenia: the secular and sacred roles of dogs and wolves

Being a mirror image of certain ideological perspectives of ancient civilization, a funeral rite allows us to restore certain features of its ancient spiritual culture. Funeral rites also exercised special burial practices, probably dealing with the animal totemic cult.

The practice of burying dogs used to have deep-rooted ritual traditions in ancient Armenia. This is illustrated by dog sacrifices are found in the shrines of Late Antique Shirak 1st c. BC – 1st c. (Shirakavan, Beniamin). Dogs buried in the Jrapı settlement (also located in Shirak region) may also relate to the ritual funeral practice, alongside with Shirakavan and Beniamin. Wolf sacrifices discovered in the shrines of the Kura-Araxes culture in Mets Sepasar are also part of a ritual practice. As well as the abundant number of wolf skeletal remains found in burials of the Early and Middle Bronze Ages in Aghavnadzor.

The important role that wolves and dogs used to play in the life of ancient civilizations is best evidenced by their rock images found in the Geghama and Syunik mountains. However, it should be noted that images of wolves and dogs have not been separate. The unity in concepts of «wolf» and «dog» in mythology and images has been preserved even after separate names of these animals have been identified and described as separate. Zoomorphic clay and bronze figurines discovered in archaeological sites of ancient Armenia are a vivid evidence of a symbolic meaning of wolf/dog. The statuettes may have had protective significance linked with the existence of a cult of ancient Armenians called “araless”, which means idols with a human body and a dog head. The legends say they lick the wounds of injured men and revive them.



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Laura Harutyunova

Scientific center of Zoology and Hydroecology NAS RA; Institute of Zoology; Republic of Armenia;
zool_laura@yahoo.com

Molluscs from the archaeological monuments of ancient Armenia

Shells of molluscs are found quite often in archeological excavations. Two classes of molluscs are found in the settlements and burials of Armenia: terrestrial molluscs from Gastropoda and freshwater bivalve from Bivalvia. From this two classes 4 families, 7 genera and 8 species were identified.

Shengavit monument: Fortress with a citadel and a necropolis. It dates from the late IV - III centuries BC. Along with the bone remains of fish, birds and mammals, the right valve of freshwater molluscs *Crassiana* sp.

Mets Sepasar monument : Bronze Age monument dated from XXVIII-XXVI centuries BC was excavated. The right valve of the freshwater molluscs *Unio* sp.

Shirakakavan burial: covers the period from III to I millennia BC (I - IX-VIII centuries). The lower part of a freshwater molluscs *Unio* sp.

Verin Naver burial: it dates beginning of III - II millennia BC. Terrestrial and freshwater molluscs were discovered during the excavations. Terrestrial molluscs – *Helicella crenimargo*; *Chondrula tridens*.

Freshwater molluscs- the left and right valves of freshwater molluscs *Unio* sp.

Lori Berd burial: there were 28 burials discovered, belonging to the Early-Middle Bronze and the Early-Late Iron Ages. Terrestrial mollusks - *Hesseola solidior*; *Helicella derbentina* ; *Oxychilus subeffusus*.

Tavush burial: Dates to the Middle Bronze Age - I millennium BC. Two specimens of well-preserved shells of land snail *Helix albescens*. The shells of mollusks discovered and identified from chronologically different eras of the Holocene period belong to the modern aquatic and terrestrial mollusc fauna of the Caucasus.



Thursday 11th June 2015

15:10 – 17:30

Lightning and poster session

Özlem Sarıtaş¹, Mihriban Ozbarsaran², Joris Peters^{3,4}, Hjlke Buitenhuis⁵ and Nadja Pollath⁶

1. *The University of Sheffield; United Kingdom; ozlemsaritas@gmail.com*

2. *Istanbul University; Turkey*

3. *ArchaeoBioCenter and Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München; Munich; Germany; joris.peters@lmu.de*

4. *SNSB, Staatssammlung für Anthropologie und Paläoanatomie; Munich; Germany*

5. *Groningen Institute of Archaeology, University of Groningen; the Netherlands*

6. *ArchaeoBioCenter and Institut für Paläoanatomie, Domestikationsforschung und Geschichte der Tiermedizin, Ludwig-Maximilians-Universität München; Germany; nadja.poellath@palaeo.vetmed.uni-muenchen.de*

Red Deer and Human: From Palaeolithic to Iron Age in Anatolia.

The red deer (*Cervus elaphus*) always played an important role in the food economy systems of the hunter gatherers in the Paleolithic Age and to a large extent into the Iron Age. This species presents the main subject of this study. It has been chosen because it was never domesticated by humans. Until recently, there has been no reliable research establishing the size variation of red deer in Anatolia. The key research question of this study was to determine whether or not there was a human impact on the species and whether any domestication processes took place in the archaeological process of Anatolia.

The aim of this research is to provide a conceptual theoretical framework based on a database of red deer remains from all sites and find spots in Anatolia from the Pleistocene Age to the end of the Iron Age. A database was built up, containing the data for this study which was collected by going through the records of all excavated settlements where remains of red deer were found. The database considers morphological characteristics, age, sex, and a detailed presentation of the total number of elements. Moreover, it will be used to reveal the significance of red deer in terms of the subsistence economy within the settlements.

The size of the bones from different regions in Anatolia where the find spots are located, certain periods, the north-south axis and east-west axis of Turkey were compared to each other. These changes in the size of red deer bones are presented on charts created with the LSI method. If there is a crucial size change, demonstrating the primary reasons for this change.



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Groningen

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Thursday 11th June 2015

15:10 – 17:30

Lightning and poster session

Megan Spitzer¹ and Melinda A. Zeder¹

National Museum of Natural History; Smithsonian Institution; USA; Correspondence: spitzerm@si.edu

Seasonality and habitat exploitation at Hallan Çemi: Results of the analysis of the avifauna

The large faunal assemblage from the Late Epipalaeolithic site of Hallan Çemi yielded a remarkable corpus of avifaunal remains of nearly 1200 identified fragments representing 50 distinct taxa. These remains shed light on important questions about the seasonal occupation of the site, about the habitats exploited by Hallan Çemi residents, and the strategies employed to exploit birds. Avifauna support claims made more than two decades ago by site excavators that the site was occupied year round, with migrant birds exploited representing a full seasonal round. They also highlight the remarkable diversity of habitats exploited by Hallan Çemi residents, which include wetlands, open woodlands, grassland/steppe, rocky arid regions, and higher elevation mountain ecozones. The high numbers of ground feeding taxa that form flocks in the winter suggests an opportunistic strategy that took advantage of high densities of more vulnerable species during winter months. Finally, differences in avifaunal remains recovered from household debris and a central activity area (which other faunal data suggests was the site of feasting) show strong differences in taxa and in parts represented, pointing to the use of raptor and other large bird elements in ritual paraphernalia.



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15:10 – 17:30

Lightning and poster session

Verene Chalendar

Ecole Pratique des Hautes Etudes; Paris; France; verene.chalendar@gmail.com

What place for animals in the medical practices of Mesopotamia? An overview through cuneiform tablets.

Our work concerns the use of animals and the preparations made out of their parts as recorded in assyro-babylonian medical texts. The study of numerous cuneiform tablets provides us with interesting information about medical and ritual practices implemented to relieve illnesses of natural or supernatural origin. Ingredients of all kingdoms (vegetable, mineral and animal) were employed. However, those from the animal kingdom appear to have a more significant role.

This lecture will present the first results of a research which tries to make an inventory of and to define more precisely the use of animals by men in a very particular frame: the preparation of medical remedies of the Ancient Near-East.

Can we observe some regular usages of a particular animal in a specific pathology? What are the reasons that motivate the use of a certain kind of ingredient? Are these reasons « practical » (an observed efficiency due to pharmacological properties) or « magical-symbolic »?

We will also broach a recurrent interrogation in the study of mesopotamian medicine: do names of ingredients reflect their real nature, or are they popular designations or even “coded names” in order to encrypt a secret knowledge?

This multidisciplinary project, although mostly conducted through the translation of texts is enhanced by other scientific fields, in particular by archaeozoology which offers a new perspective and corroborates or denies our hypotheses regarding the identification of animals found in our texts.



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Lightning and poster session

László Bartosiewicz and Erika Gal

Institute of Archaeological Sciences; Loránd Eötvös University; Budapest; Hungary; bartwicz@yahoo.com

Meet the East: 16th–17th c. Ottoman Period animal exploitation in Hungary

Between 1526 and the late 17th century, the medieval kingdom of Hungary was divided between the remains of the Catholic Hungarian Kingdom in the west, Protestant Transylvania in the east and the northern tip of the Ottoman Empire wedged in-between from the south. This geopolitical setup, however, should not only be seen in terms of military history and political conflict. It was also a time of vivid cultural interaction, when the exchange of goods and ideas between East and West intensified. Under Southwest Asian influence not only new domestic species appeared in the area (camel, water buffalo, possibly turkey), but the known stocks of sheep, horse, poultry, and cattle have also apparently changed. This means that changes in animal exploitation took place in almost all spheres of everyday life, including common meat diets (declining pork consumption), animal trade (cattle droves), military transport (new types of mounts and draught animals). As a result of political/ideological competition the use of animals in self-representation or as markers of social identity became likewise important. On the basis of these developments questions of breed formation can be meaningfully discussed. These formidable developments will be reviewed on the basis of archaeozoological evidence from Ottoman Period sites in Hungary.



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15:10 – 17:30

Lightning and poster session

Mike Buckley

Manchester Institute of Biotechnology; University of Manchester; Manchester; United Kingdom;

m.buckley@manchester.ac.uk

Zooarchaeology by Mass Spectrometry – the capabilities and limitations of collagen fingerprinting for species identification

Recent developments in the analysis of bone collagen by soft-ionisation mass spectrometry have provided an objective means of species identification, particularly useful in application to the large numbers of fragmentary remains found on most archaeological sites worldwide. Initially these biochemical methods have focused solely on variation between domesticated taxa, but current work explores the variation of collagen fingerprinting across a range of wild taxa. This work presents the methodology used by what is loosely described as 'Zooarchaeology by Mass Spectrometry' (ZooMS) collagen fingerprinting and the taxonomic limitations in different groups of vertebrates, including mammals, reptiles and fish. More specifically, examples are given of analyses carried out on archaeological sites from across Southwest Asia.



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16:30 – 17:30

Poster session

Moussab al Besso

Archéorient CNRS 5133/Lyon ; Université Lyon; Lyon; France; mbesso78@yahoo.fr

Age profiling of small populations of wild goats in Crete (Capra aegagrus cretica)

Many archaeozoological studies about Caprinae refer to the studies of S. Payne, E. Deniz and A. Grant who introduced the age estimation methods with data from the study of mandibulae. This method was created using contemporary domesticated species, and works in most archaeozoological studies. This having been said, there is no certainty it corresponds to all populations, especially when they are small. This poster presents the dental study of Cretan wild goats (*Capra aegagrus cretica*) collected during the 2011 survey organised to collect skeletons of this species in the Samariaen gorges in Crete and directed by A. Gardeisen (CNRS, UMR5140).

This study compares morphological data taken from the crania, horn cores and mandibulas of these goats to that of other better known species, and establishes their age profile from the teeth of nearly forty individuals.



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Thursday 11th June 2015

16:30 – 17:30

Poster session

Kaptijn, E.

Royal Belgian Institute of Natural Sciences; Belgium; ekaptijn@naturalsciences.be

Faunal economy during the Early Bronze Age in the southern Levant

Based on an overview of the investigated faunal assemblages from excavated sites this poster provides an attempt to reconstruct Early Bronze Age I-III animal management strategies in the southern Levant. As human subsistence is inextricably linked to the local environment, the faunal economy of the specific sites will be evaluated in correlation with the environmental setting and identified changes therein. Additionally, attention will be paid to the link between the faunal economy and the position a site took in the settlement system of a region, e.g. a regional centre, small hamlet or anything in between.



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16:30 – 17:30

Poster session

Antonio Curci¹ and Elena Maini²

1. *University of Bologna; Italy; antonio.curci@unibo.it*

2. *ArcheoLaBio; Research Centre for Bioarchaeology; University of Bologna; Italy*

New data on the use of sheep and goat knucklebones in the Near East during the Iron Age.

The poster presents new discoveries of worked and unworked knuckle-bones (astragali) from sheep and goat found at different sites dating from the Late Bronze Age to the Iron Age.

A group of seven astragali with traces of anthropic modifications came to light within a cinerary urn found in the Iron Age necropolis of Yunus (XII-VIII century BC), near the site of Karkemish (Turkey).

Two more modified specimens came from Karkemish itself.

A further group of 14 sheep and goat knucklebones with evidence of modification and traces of red ocre has been found in direct connection with human bones within a long collective grave recently excavated at Daba (Sultanate of Oman), in use from the Late Bronze Age (ca. 1600-1350 BC) till the Iron Age II/III Period (ca. 600 BC).

The zooarchaeological analysis of these recent discoveries related to both funerary and domestic contexts confirms previous hypotheses that interpreted knucklebones as ritual objects and amulets, but admit also their possible use as dice-like objects for divination and gaming.



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Session 6: Fauna in sociocultural practices

Friday 12th June 2015

09:00 – 09:20

Session 6: Fauna in sociocultural practices

Nimrod Marom

Laboratory of Archaeozoology; University of Haifa; Israel; nmarom02@campus.haifa.ac.il

Ritual in non-monumental contexts: Thoughts on four zooarchaeological case studies

The pervasive practice of ritual in early antiquity was not confined to large temples, but was dispersed throughout other, less conspicuous features of village and urban landscapes: houses, neighborhood shrines, and mortuary chapels. This paper examines zooarchaeological evidences to the practice of ritual in such non-monumental settings, and demonstrates how urban contexts can be independently flagged as related to ritual using animal bone assemblages. The efficacy of different zooarchaeological gauges to the practice of ritual in non-monumental settings will be discussed using new case studies from Sha'ar Hagolan, Abel Beth Ma'acha, Tel Rehov (all in Israel) and Zincirli Höyük (Turkey).



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09:20 – 09:40

Session 6: Fauna in sociocultural practices

Jill Weber

University of Pennsylvania; Museum of Archaeology and Anthropology; USA; jllwbr8@gmail.com

More than just "good eats": Animals as administrative artifacts

Numerous late, Late-Chalcolithic (LC4) settlements across a variety of geographical locales in modern Turkey and Syria contain rubbish deposits with homogeneous fill including large amounts of mass-produced pottery, administrative paraphernalia, and faunal remains of sheep and goat. The inclusion of beveled-rim bowls and cylinder -seals and -sealings – hallmarks of “southern Uruk” material culture – are consistent with theories about Late-Uruk expansion from southern Iraq and suggest those “foreigners” physical presence at the settlement in an administrative or exchange functional-capacity.

Despite the specialized, administrative nature of many of the artifacts and association of the rubbish deposits with public architecture, the highly homogeneous sheep and goat deposits within the rubbish are often viewed as artifacts of cultural or ethnic distinctiveness of the individuals that created the rubbish – rather than functional debris from specialized activities.

But, why should the animal bones result from processes different than the remainder of the cultural debris? I argue that these rubbish deposits contain homogeneous artifacts because they were created during the performance of similar, specialized tasks. Close examination of the Late-Uruk pits from Tell Brak, northern Syria, suggests that these probably were created in the springtime, when out-sourced herds were brought back to their owners for shearing and accounting.



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09:40 – 10:00

Session 6: Fauna in sociocultural practices

Lidar Sapir-Hen, Yuval Gadot and Israel Finkelstein

Tel Aviv University; lidarsap@post.tau.ac.il

Jerusalem animal economy in the Iron Age: The relationship between the central city and its hinterland

Scholars have emphasized the close ties between the city of Jerusalem and its rural hinterland. These ties are of special significance during the late Iron Age II (8th-7th centuries BCE), when Jerusalem's urban growth was at its peak and Judah came under Imperial domination. These conditions promote questions relating to the way Jerusalem sustained itself as an urban environment while becoming a large city, and to the impact that imperial domination had on the economy of the city and/or on the rural agricultural production.

Previous studies on Jerusalem's agricultural landscape during these periods focused on the settlement pattern and location of the many rock-cut agricultural installations. It highlighted its specialized nature and the fact that this was not an organic growth but rather a well-planned initiative turning the lands around Jerusalem into estates. It seems that a redistributing economical system was deployed based on spatial specializations. In order to investigate if the difference between urban dwellers and rural producers is evident in the animal economy as well, we analysed two faunal assemblages: Western Wall Plaza (WWP), located within Jerusalem, and Tel Moza (TM), located in Jerusalem's hinterland. The latter served as an administrative and possibly a cultic center outside of Jerusalem.

We found that while WWP animal economy focused on males of prime age and on meat consumption, and did not engage in actual herding or agriculture, TM focused on producing caprines secondary products and was highly engaged in agriculture. These faunal assemblages and additional published sites within and outside Jerusalem reveals a regional pattern of different specializations contributing to the interaction between rural and urban segments of Jerusalem in the Iron Age. This pattern is also demonstrated by other archaeological finds. The finds are then put in the wider context of the Imperial domination and its implications.



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10:00 – 10:20

Session 6: Fauna in sociocultural practices

Yasha Hourani

Freelance - Beirut rescue excavations; yashahourani@hotmail.com

Life and death of dogs in Persian Beirut: Evidence from the burials

Rescue excavations of the last decade in the city of Beirut yielded a considerable number of dog burials dating to the Persian period. Dog burials were a recurrent practice in the Levant during this period, though its cultural motivation is still unclear. Twenty dog burials recovered from five different sites in Beirut were analyzed. This study allowed us to relate these burials to the same phenomenon attested in the Levant and to point out the specific characteristics of this practice in Beirut; the location of the inhumations on the city-scape, the burial patterns and the biological features of the buried animals. All these data contribute to the clarification of some cultural aspects of the dog inhumation custom. Moreover, the biological data contribute to the identification and description of the dog population.



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Session 7: Archaeozoology of Africa

Friday 12th June 2015

10:50 – 11:10

Session 7: Archaeozoology of Africa

Jaco Weinstock¹, E. Williams¹ and Neal Spencer²

1. University of Southampton; Faculty of Humanities (Archaeology); United Kingdom; jw20@soton.ac.uk

2. British Museum; Department of Ancient Egypt and Sudan; United Kingdom

Faunal remains from the Pharaonic site of Amara West, Sudan: preliminary results.

This study is part of an on-going investigation of the animal bone remains from Amara West, a town created by Pharaonic Egypt in the early 13th century BC. In this presentation, we focus on the remains from two separate houses, which differ in their location (inside/outside town walls) and that are thought to differ in the socio-economic status of their occupants. We also discuss changes brought about by the Egyptian conquest of the area as reflected by the faunal remains.



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11:10 – 11:30

Session 7: Archaeozoology of Africa

Joséphine Lesur

UMR 7209 ; MNHN-CNRS; France; jolesur@mnhn.fr

Fishing and herding in the Nile Delta during the Predynastic (4th millennium BCE)

In the Nile Delta, as in the south of Egypt, the fourth millennium BCE appears to have been a period of subtle evolutions. Recent archaeological data have revealed that the societies of the Delta evolved independently from those of Upper Egypt due to their privileged relationship with the Near East. In terms of food production, the Delta provided very favorable conditions for agriculture as well as livestock herding (especially pig and cattle). Nevertheless, wild resources, especially Nile fishes continued to provide an important part of the diet. Using archaeozoological data coming mainly from the ongoing excavations of Tell el-Iswid, the aim of this paper is to illustrate the characteristics of animal exploitation in this region throughout the fourth millennium BCE as well as its evolution and its relationship with the Near East as well as Upper Egypt.



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Session 7: Archaeozoology of Africa

Günther Karl Kunst¹, Konstantina Saliari¹ and Irene Forstner-Müller²

1. VIAS - University of Vienna; Natural History Museum Vienna; Austria; guenther.karl.kunst@univie.ac.at

2. ÖAI - Austrian Archaeological Institute Cairo; Egypt

Intra-site variation in animal bone assemblages from two urban areas at Tell el-Dab'a (Egypt) - searching for a pattern.

Two urban areas formed the aim of recent salvage excavations at Tell el-Dab'a - Avaris (Nile Delta, Egypt). Rushdi III, situated in the north-east of the site, was excavated from 2010-2012. The trench, measuring about 60 x 50m, yielded residential quarters of varying sizes, separated by streets. In the western part, larger buildings, possibly with administrative functions, prevail. Here, the settlement started already in the 15th dynasty and was never overbuilt until its abandonment in the late 2nd Intermediate Period. The eastern part, separated by a central street, corresponds to a domestic town quarter typical for Avaris, which was later changed for smaller houses, until it was abandoned at roughly the same time. The excavation yielded a varied set of contexts: room fills, street layers, fireplaces, granaries, small pits, floors, walls and other types of deposits. In 2013-14, the site Rushdi IV, situated 100m to the west, was investigated. What was originally believed to be a river harbour, turned out to be another settlement area, with some funeral structures, of the 2nd intermediate period, which is partly disturbed by Ramessid buildings.

In contrast to assemblages from palatial compounds of Avaris, there is a clear upper limit of fragment size in the animal remains found. Most contexts favoured the preservation of small specimens, containing remains indicative of taphonomic stress (teeth, shaft splinters) and delicate bones of birds and fish. At Rushdi IV, some samples are totally dominated by the bones of birds and fish. Although the mechanisms of assemblage formation processes are not yet completely understood in both areas, some connections between types and position (e.g. in/outdoor) of contexts and their faunal content can be drawn. It is also not clear if differences between the administrative and the domestic compounds mirror functional divisions, or are rather due to the variable presence of certain feature types (silos, pits).



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11:50 – 12:10

Session 7: Archaeozoology of Africa

Louis Chaix

Muséum of Natural History Geneva; Switzerland; louis.chaix@bluewin.ch

Hunting hartebeests (*Alcelaphus buselaphus*) in Sinai during Persian times (6th to 4th century BC)

The site of Tell el Herr, in northern Sinai, delivered numerous animal remains. In the Persian levels, many bones of hartebeests (*Alcelaphus buselaphus*) were found. The presence of this antelope, actually living in central Africa, will be discussed in terms of their exploitation for meat and horns.



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Session 8: Hellenistic, Roman and Medieval studies

Friday 12th June 2015

13:30 – 13:50

Session 8: Hellenistic, Roman and Medieval studies

Pam J. Crabtree and Douglas V. Campana

New York University; USA; pc4@nyu.edu

Subsistence and ritual—faunal remains from the Iron Age, Hellenistic, and Medieval site of Kinik Höyük, Southern Cappadocia, Turkey

Kinik Höyük is a multi-period site located in southern Cappadocia, Turkey. It appears to have served as a center of the Tuwana polity that formed after the collapse of the Hittite Empire. The first three seasons of excavation (2011-13) uncovered features dated to the Iron Age, Hellenistic, and Medieval (12th-13th centuries CE) periods. In 2013, an unusual deposit dating to the Achaemenid period (6th-4th centuries BCE) was uncovered that included bird figurines, substantial quantities of ash, and large number of animal bones which were almost exclusively caprines. This paper will explore the zooarchaeological evidence for subsistence and ritual at Kinik Höyük.



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13:50 – 14:10

Session 8: Hellenistic, Roman and Medieval studies

Herve Monchot¹, Lionel Gourichon² and Emma Stoetzel³

1. Labex Resmed; Université Paris; Paris; France; herve.monchot@wanadoo.fr

2. CEPAM (CNRS, UMR 7264); Université Nice Sophia-Antipolis; Saint-Jean d'Angély 3 (SJA3); Nice; France;
lionel.gourichon@cepam.cnrs.fr

3. Muséum national d'Histoire naturelle; Département de Préhistoire – UMR 7194 HNHP1; Paris; France;
emma_stoetzel@hotmail.com

The faunal material from the Roman fortress and its associated church of Khirbet es-Samra (Mafraq Province, Jordan)

A large amount of faunal remains has been recently recovered from the excavations of the Roman (and Byzantine) fortress and the adjacent building of the village of Khirbet es-Samra (Jordan). The study of this assemblage shows great taxonomic diversity and provides abundant data about the semi-arid environment at that time as well as about the subsistence system of the inhabitants. Moreover, the zooarchaeological data evidence the historical shift from the Byzantine to the Umayyad Empire through the reuse of the church after its abandonment as sheepfold/granary.



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Session 8: Hellenistic, Roman and Medieval studies

Chiara A. Corbino

University of Sheffield; Sheffield; United Kingdom; chiara.corbino@gmail.com

The elite and the villagers in the 14th century AD: Zooarchaeological analysis at Tell Hesban (Jordan)

Recent archaeological excavations carried out at Tell Hesban (Madaba, Jordan), which are part of the Tell Hesban Cultural Heritage Project, unearthed a considerable amount of animal bones, dating back to the first half of the 14th century AD. At that time, the site was the administrative capital of the Balqua region. Mamluk sources refer to it as a center for agricultural management. It included vast grain fields, gardens, orchards and also a marketplace. In the 1340s an earthquake destroyed the settlement. All the administrative offices were then moved to Amman.

The specimens analysed here were collected from the citadel as well as the village on the tell slopes. The research focused on defining food supplies and landscape changes during the Mamluk period. The faunal assemblage is fairly diversified. The results show that the inhabitants of Hesban relied mainly on domestic animals. Sheep and goats are prevalent, followed by chicken. In the citadel wild animals represented just an occasional contribution to everyday meals. Among wild animals, gazelles are the most abundant. Additional results indicate that animals were not bred within the citadel, but they were butchered and processed outside. Meat-bearing elements were brought into the citadel from the nearby village in order to satisfy the demand of the elite group based at Hesban. This study aimed to reconstruct the connections between the elite set in the citadel and the local population. The analysis provides a picture of the 14th century Mamluks' daily life at Tell Hesban.

