BONES & IDENTITY
Reconstructing Social and Cultural Landscapes in the Archaeozoology of Southwest Asia

June 23 – 28 2013

ASWA HAIFA 2013
Archaeozoology of Southwest Asia and Adjacent Areas 11th Meeting

Program and Abstract book

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ASWA HAIFA 2013

BONES & IDENTITY

Reconstructing Social and Cultural Landscapes in the Archaeozoology of Southwest Asia
Program

Sunday, June 23, 2013
Arrival to University of Haifa
17:00 Visit to the Bahá’i Gardens
18:00 Free evening down town

Monday, June 24, 2013
Eshkol Tower, Observation Gallery
08:30 – 09:00 Registration
09:00 – 09:30 Opening remarks: Guy Bar-Oz
   Vice president of the University of Haifa: Michal Yerushalmey
   Dean of the Faculty of Humanities: Reuven Snir
   Mina Weinstein-Evron, Zinman Institute of Archaeology

   Session 1: Prehistoric Society, Economy and Human Ecology
   Session Chair: Britt Starkovich.

   09:30 – 09:50 Natalie Munro and Leore Grosman: The gazelles from the Natufian burial
cave of Hilazon Tachtit, Israel (12,000 BP): Feast foods or domestic debris?

   09:50 – 10:10 Miriam Belmaker: A new look at "on Mice and Men": Should commensal
species be used as a universal indicator of sedentism or are they a unique
case of the Natufian of the Levant?

   10:10 – 10:30 Veerle Linseele: The early history of domesticated cattle in Africa

   10:30 – 10:50 Reuven Yeshurun: Late Paleolithic subsistence and ecology in the Kom
   Ombo Plain, Upper Egypt

   10:50 – 11:10 Tal Simmons, Anna Belfer-Cohen, Ofer Bar-Yosef and Rivka
**Rabinovich:** To be or not to be a Levantine Aurignacian: Aves exploitation at Hayonim Cave (Layer D)

11:10 – 11:30  **Simon Davis and Cleia Detry:** Zooarchaeological evidence for a crisis in the Mesolithic: A Lusitanian view

11:30 – 12:00  **Coffee break**

Session 2: New Fieldwork and Analyses from the Levantine Neolithic

Session Chair: **Natalie Munro**

12:00 – 12:20  **Nuha Said-Agha, Guy Bar-Oz and Dani Nadel:** Ecology, taphonomy and human behavior in the Neolithic Period: Analysis of faunal remains from Tel Ro‘im West

12:20 – 12:40  **Carlos Tornero, Marie Bălăsse, Miquel Molist, and Maria Saña:** Adoption, increase and consolidation of sheep production at Tell Halula site (Middle Euphrates Valley, Arab Republic of Syria) during Middle to Late PPNB occupations: an integrated approach using osteological and stable isotopes analyses

12:40 – 13:00  **Britt Starkovich, Mohsen Zeidi, Simone Riehl and Nicholas Conard:** Faunal remains from Chogha Golan, a PPN site in the Zagros foothills of Western Iran

13:00 – 13:20  **László Bartosiewicz:** Halaf period animal remains from Tell Aqab, northeastern Syria

13:20 – 13:40  **Hitomi Hongo, Saiji Arai, Can Yumni Gundem, Yutaka Miyake and Ken-ichi Tanno:** Animal exploitation at an early sedentary village on upper Tigris: Faunal remains from Hasankeyf Höyük (Batman, Turkey)

13:40 – 15:30  **Lunch break and guided tour at the Hecht museum**
Session 3: Neolithic Zooarchaeology: In and Beyond the Levant

Session Chair: Rivka Rabinovich

15:10 – 15:30 Ofer Bar-Yosef: Interactions between farmers and foragers during the Neolithic period in the Levant

15:30 – 15:50 Jean-Denis Vigne, Brunet Frédérique, Debue Karyne, Mathilde Rozen and Khudzhanazarov Muhiddin: Shark teeth accumulation in the Early Neolithic site Ajakagytyma (Kel’teminar, Uzbekistan): An original use of fossils for making tools?

15:50 – 16:10 Kamilla Pawlowska: Smell of Neolithic Çatalhöyük (Turkey). Time and space of human activity

16:10 – 16:30 Arati Deshpande-Mukherjee: Human animal interactions during the Harappan period in the Ghaggar region of northern India, insights from Bhirrana

16:30 – 16:50 Julie Daujat, Keith Dobney and Jean-Denis Vigne: Morphological variability of the Mesopotamian fallow deer (Dama dama mesopotamica) in Cyprus from its first introduction until the Bronze Age (ca. 8000-2700 cal BC)

17:00 Visit to the Mount Carmel Animal Sanctuary Nature Reserve and an outdoor reception
Tuesday, June 25, 2013
Eshkol Tower, Observation Gallery

Session 1: Anatolian Urban Economies

Session Chair: László Bartosiewicz

09:00 – 09:20 Canan Çakırlar, Suzanne Pilaar-Birch, Remi Berthon, Murat Akar, Mara Horowitz, Ashhan Yener and Lionel Gourichon: Social diversity in LBIIA Amuq: A zooarchaeological study of recently excavated LBIIA contexts in ancient Alalakh

09:20 – 09:40 Nimrod Marom and Virginia Herrmann: The faunal remains from the north lower city of Zincirli Höyük: Economy, society and ritual

09:40 – 10:00 Benjamin Arbuckle: Zooarchaeology and early complex societies in Bronze Age Anatolia

10:00 – 10:20 Tina Greenfield: The palace vs. the home: the identification of status from the analysis of animal bones from an Assyrian provincial city

10:20 – 10:40 Günther Karl Kunst: High-resolution faunal data from settlement horizons at Oymağaç Höyük (Turkey)

10:40 – 11:10 Coffee break
Session 2: Exploitation of Marine Resources

Session Chair: Canan Çakırlar

11:10 – 11:30 Irit Zohar and Naama Goren-Inbar: We are what we eat: The role of carps (Cyprinidae) in Early Acheulian diet

11:30 – 11:50 Omri Lernau and Ronny Reich: Fish remains from the Iron IIb period in the City of David, Jerusalem

11:50 – 12:10 Aldona Kurzawska and Daniella Bar-Yosef Mayer: Social and economic significance of Dentalium shells for hunter-gatherers in the southern Levant

12:10 – 12:30 Daniella Bar-Yosef Mayer: Mollusc exploitation at Çatalhöyük

12:30 – 12:50 Inbar Ktalav: Pilgrims, scallops and tax evasions in the 13 century AD

12:50 – 14:20 Lunch break

14:20 – 15:45 Session 3: Poster Session

Session Chair: Guy Bar-Oz

- Gali Beiner and Rivka Rabinovich: Treating bones: Conservation of elephant remains from Revadim

- Ashley Brown and Miriam Belmaker: The climate in the Mediterranean Levant during the Younger Dryas: The micromammal evidence

- Ruby Ceron-Carrasco: 'The Place with Beads': A preliminary study of fish and mollusca remains from the excavations at Boncuklu, Central Anatolia

- Bea De Cupere, Sheila Hamilton-Dyer and Jeroen Poblome: A soup kitchen in the eastern suburbs of ancient Sagalassos, Turkey? The evidence of animal remains and material culture
• Haskel Greenfield, Annie Brown and Anna Borren: Making the cut: Changes in butchering patterns from the Early Bronze Age and later periods at Tell Halif

• Haskel Greenfield, Trent Cheney and Ehud Galili: A taphonomic and technological analysis of the butchered animal bone remains from Atlit Yam, a submerged PPNC site off the coast of Israel

• Tehilla Gugenheim, Avraham Faust, Ram Bouchnick and Guy Bar-Oz: The zooarchaeology of Tel 'Eton: preliminary analysis

• Andrew Kandel, Ron Shimelmitz and Avraham Ronen: A new look at the shell beads from Sefunim Cave, Mount Carmel (Israel)

• Assaf Kleiman: Unified examination of ceramic and faunal remains, case-study from Tel Aphek (Israel)

• Veerle Linseele: Animals at the Graeco-Roman town of Karanis (Fayum Oasis, Egypt)

• Nina Manaseryan and Laura Arutyunova: Subfossil fauna of the Holocene in Lake Sevan Basin

• Miriam Pines, Lidar Sapir-Hen and Oren Tal: Crusader's Diet: Arsur (Apollonia-Arsuf) as a case study in war and peace

• Konstantina Saliari: Reconstructing prehistoric identities: Molluscan material from western Asia and the Aegean

• Carlos Torenro, Miquel Molist and Maria Sana: Characterizing gazelle exploitation at peasant societies: the PPNB tell Halula case

• Reuven Yeshurun, Nehora Schneller-Pels, Lior Weissbrod, Guy Bar-Oz, Omry Barzilai, Israel Hershkovitz and Ofer Marder: Humans and carnivores in the Upper Paleolithic of Manot Cave, Upper Galilee, Israel: Preliminary zooarchaeological results

• Irit Zohar, Anuar Zidan and Michal Artzy: The role of preserved fish: Evidence of fish processing and long-term preservation during the Late Bronze Age (14th Century BCE)
16:00 – 21:00 Visit to UNESCO World Heritage site of Mount Carmel Caves (with Reuven Yeshurun and Mina Weistein-Evron) and the coastal site of Tell Dor (with Ayelet Gilboa). Dinner on the beach (bring a light jacket and mosquito repellent)

**Wednesday, June 26, 2013: Excursion**

08:00 – 12:00 Visit to the Middle Bronze age site of Kabri (with Assaf Yasur-Landau and Eric Cline)

12:00 – 14:00 Visit to the Upper Palaeolithic site of Manot Cave (with Ofer Marder, Omry Barzilai and Israel Hershkovitz)

14:00 – 16:00 Picnic in Goren Park with a view to the Crusaders fortress of Monfort (with Adrian Boas)

16:00 – 20:00 Gan Hashlosha National Park (Sahne) - mineral pools and swimming

20:00 – 22:30 Visit to the Roman city of Scythopolis (Beit She’an) (audio-visual presentation)

**Thursday, June 27, 2013**

Eshkol Tower, Observation Gallery

**Session 1: Approaches to the Domestication of Pigs**

Session Chair: Jean-Denis Vigne

09:00 – 09:20 Lidar Sapir-Hen, Guy Bar-Oz, Yuval Gadot and Israel Finkelstein: Pig husbandry in Iron Age Israel and Judah: The origin of the pig taboo

09:20 – 09:40 Allowen Evin, Linus Girdland Flink, Thomas Cucchi, Guy Bar-Oz, Lidar Sapir-Hen, Meirav Meiri, Greger Larson and Keith Dobney: Pigs from the Near-East: Identification and morphological change through time
09:40 – 10:00  Ximena Lemoine, Katelyn Bishop and Scott Rufalo: A new synthesis for aging prehistoric pigs (*Sus scrofa*): consolidating tooth eruption and attrition studies

10:00 – 10:20  Meirav Meiri, Steve Weiner, Dorothee Huchon, Guy Bar-Oz and Israel Finkelstein: European pigs in the southern Levant and the Sea People migration

10:20 – 10:50  Coffee break

Session 2: Bones and Cultural Identity

Session Chair: Pam Crabtree


11:10 – 11:30  Justin Lev-Tov: Philistine diet, population origins, and ethnic boundaries

11:30 – 11:50  Adam Allentuck: An acquired taste: cattle forelimbs in the southern Levant and Egypt during the late fourth millennium

11:50 – 12:10  Angelos Hadjikoumis: The unknown identity of Early Bronze Age Attica

12:10 – 13:10  Lunch break

13:10 – 13:40  ASWA business meeting
Session 3: Zooarchaeological Methods and Applications: Technology and Biology

Session Chair: Hitomi Hongo

13:40 – 14:00 Alice Choyke: Worlds within worlds: Far-flung distributions and narrow manufacturing traditions in worked osseous materials in the late Chalcolithic of Southwest Asia

14:00 – 14:20 Nina Manaseryan: Animal bones from burials of Armenia

14:20 – 14:40 Lior Weissbrod, Guy Bar-Oz and Israel Finkelstein: Ancient urban ecology in the Near East reconstructed from microvertebrate remains

14:40 – 15:00 Gila Kahila Bar-Gal: “Dead bones can talk”: An answer to open questions using ancient DNA studies

15:00 – 15:20 Ali Sirwan: Geometric morphometric analysis of camels’ Basipodium bones: 3D applications for identifying species

15:20 – 15:50 Coffee break

Session 4: Zooarchaeological Perspectives on the Classical and Medieval Periods of Egypt and the Levant

Session Chair: Haskel Greenfield

15:50 – 16:10 Pam Crabtree: Class and “Romanization” in late Roman Egypt: Issues of identify and the faunal remains from the site of Amheida in the Dakleh Oasis, western Egypt

16:10 – 16:30 Lee Perry-Gal, Guy Bar-Oz, Adi Erlich and Ayelet Gilboa: The cultural history of the chicken in the Southern Levant: A view from the Hellenistic site of Maresha

16:30 – 16:50 Hervé Monchot: *Quid novum ad mensam hodie?* Food habits in a Roman *mansio* (Khirbet es-Samra, Jordan)
16:50 – 17:10  Ram Bouchnick: From daily life to ritual in the late Second Temple Period: Comparing Qumran and Jerusalem city dump assemblages


17:30 – 17:50  Hadas Motro: Medieval human history of the Levant written on horseback

18:00 – 19:00  Visit to UNESCO World Heritage site of Acre

19:00 – 21:00  Farewell dinner at Acre Ancient Harbor

Friday, June 28, 2013: Excursion

08:00 - 12:00  Visit to Nazareth and the Church of the Annunciation

13:00 - 16:00  Swimming in the Sea of Galilee (bring swimming suite)

16:00 - 18:00  Visit to the Roman-Byzantine site of Sousista (Hippos) (with Michael Eisenberg)

17:00 - 19:00  Outdoor dinner
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ASWA HAIFA 2013
ABSTRACTS

In alphabetical order

Posters are marked with a *
An Acquired Taste: Cattle Forelimbs in the Southern Levant and Egypt during the Late Fourth Millennium

Adam Allentuck

Department of Anthropology, University of Toronto, Toronto, Canada

Zooarchaeology can reveal how food preferences become enmeshed into the transformation of ethnic identity. Research from the Early Bronze I (late fourth millennium) village of Horvat ‘Illin Tahtit (HIT), located in the central Shephelah, Israel, found a clear overrepresentation of cattle (*Bos taurus*) forelimb parts relative to hindlimb parts. This pattern is also seen in the distribution of filleting cut-marks across the cattle skeleton, which are concentrated on forelimb elements. Statistically significant correlations are not found between skeletal part frequency and food utility, and skeletal part frequency and bone mineral density. Furthermore, emphasis on the anterior half of the cattle carcass is not a product of the high rate of fragmentation incurred by cattle remains, as this destructive process does not privilege one half of the carcass over the other. Rather, this pattern is explained by a cultural preference for cattle forelimbs. This pattern is interpreted with analogical reference to practices in Egypt from the mid-third millennium. Old Kingdom elite tomb walls are decorated with slaughter scenes in which cattle forelimbs are severed with a knife under the scapula and given as temple offerings. This analogical inference is strengthened, as the association of cattle legs with status appears to date at least to the late Predynastic period (coeval with EB I). Evidence for elites, social hierarchies and competitive consumption, however, are not found in the southern Levantine EB I. Therefore, I propose that Levantine people adopted the Egyptian taste for forelimbs, but formed an indigenous valuation not rooted in status.
In this paper, I address current zooarchaeological approaches to understanding early complex societies in Bronze Age Anatolia. It is argued that animals played central roles in the development and maintenance of the systems of hierarchy and inequality that developed in the Bronze Age. These roles included the central place of livestock in the agricultural system, the development of productive commodity economies based on animal products but also symbolic and social practices such as elite hunting practices and the exchange of exotic animals among elites, related to the maintenance and symbolic expression of elite power. In this paper, I explore several aspects of the human animal relationship and its role in structuring the complex hierarchical societies of the Anatolian Bronze Age. In particular I focus on wool production, the exploitation of equids including donkeys and horses, and hunting in Bronze Age Anatolia.
Halaf Period Animal Remains from Tell Aqab, Northeastern Syria
László Bartosiewicz

Institute of Archaeological Sciences, Loránd Eötvös University, Budapest, Hungary

A small assemblage (NISP=3212) of Halaf Period (ca. 6100 to 5400 BCE) animal bones was recovered during the 1975 and 1976 field seasons at the site of Tell Aqab, located 6 km south of Amuda (Jezireh province, northeastern Syria) and some 100 km west of the Tigris river forming the current political border between Turkey and Syria. The ca. 9.5 m high settlement mound was located alongside a small seasonal stream that forms part of the the Wadi Darau drainage system where dryland farming was adapted to local climatic conditions without developing irrigation. Unsurprisingly, the poorly preserved faunal material was dominated by the bone fragments of small ruminants, evidently sheep and goat. Remains of cattle and pigs were also recovered. Hunting was indicated by the sporadically occurring remains of small equids, presumably wild ass, although gazelle could not be identified among the heavily fragmented small ruminant remains. Carnivores were not represented in the material. High fragmentation precluded the detailed metric analysis of bones. Meanwhile individual bone weights were taken in an effort to appraise the dietary contributions of the species identified. Excavations were carried out by a University of Edinburgh team following a survey in the floodplain of the Khabur River and its eastern tributaries. The purpose of excavation at the time was to clarify regional ceramic assemblages during the periods for which Aqab had good stratified remains, especially the Middle Halaf Period. Adding faunal information to this archaeological work contributes yet another data point to the prehistoric map of the Fertile Crescent.
Interactions between Farmers and Foragers during the Neolithic Period in the Levant
Ofer Bar-Yosef

Department of Anthropology, Harvard University, Cambridge MA, USA

In discussing interactions between people that belong to different socio-economic systems in the Levant I used a general geographic model concerning the relationships between farmers-herders and foragers who survived in the semi-arid region. The model is presented graphically in the attached figure. The main issue in testing this model is finding the evidence that there was an ongoing exchange between framing communities and hunter-gatherers. Among the exchanged commodities carried by the latter to meeting places or even the villages were marine shells from the Red Sea, hard rocks or finished products (beads, pendants) collected and/or produced by them, salt and perishables such as game meat and hides, that are more difficult to identify in the archaeological record. In return farmers could offer grain and other agricultural products, and possibly caprovines for keeping or eating. In this presentation, I will tentatively suggest, based on published reports the particular commodities originating in the territories of Neolithic-age farmers and foragers, although undoubtedly it is more difficult to trace the evidence of farmers’ products in the archaeological contexts of excavated sites in the semi-arid belt.
Mollusc Exploitation at Çatalhöyük
Daniella E. Bar-Yosef Mayer

Zoological Museum, Steinhardt National Collections of Natural History, Tel Aviv University, Tel-Aviv, Israel

Mollusc shells contribute to our understanding of the Çatalhöyük economy, the social and spiritual practices of its inhabitants, and their interaction with near and distant environments. The site is rich in molluscan remains from land, freshwater, and marine environments. The sources were the Mediterranean shore, fossil beds in the Taurus Mountains, and various freshwater sources in the vicinity of the site. The shells reflect a variety of human activities: Bivalves that were collected as food were collected in a nearby river. Shells of gastropods, bivalves and scaphopods that were used as personal ornaments, usually beads, originate in all the above-mentioned environments. The Çarsamba River, as well as other freshwater lakes and marshes near the site, is where mud was collected for construction materials and pottery production, and within this material were thousands of tiny freshwater snails. Some of these could have also been brought along with certain plants. The latter group informs us on the environment surrounding the site during its occupation.
Elephant (proboscidean) finds in the southern Levant tend to be meager, due to poor bone conservation, limited excavation areas and post-depositional tectonics. Most assemblages are dominated by teeth. Finds from Israel demonstrate the presence of several species, giving rise to various paleo-ecological theories on species dispersion and interactions with hominins. This is partly due to the fact that southern Levantine finds are dated no later than the Lower Palaeolithic sensu lato (ca. 1.5 ma – 300,000), whilst proboscideans in Eurasia continue into much later periods. In Israel, the Middle Pleistocene site of Revadim stands out with a relatively large excavation area of 250 m$^2$, a clearly defined stratigraphic sequence and an excavation approach emphasizing landscape-based research, studying the distribution of human activities across facies of the landscape during constrained time intervals. Thus, the conservation of elephant remains from Revadim is of considerable importance to ongoing paleontological research in Israel.

Three elephant scapulae, received in three different states of preservation, demonstrate the difficulties faced by a conservator on a low budget. We took into account the state of preservation and the need to prepare the objects for research, rather than for display. In particular, we will present the use of Japanese tissue impregnated with Paraloid B72 in acetone, built in layers over a "scaffolding" of rods and coated with microcrystalline wax for filling large gaps in bones of considerable size. This issue will be discussed in the context of other cases of gap-filling bone material with Paraloid B72, both in modern and sub-fossil bone.
A New Look At On Mice and Men: Should Commensal Species Be Used As a Universal Indicator of Sedentism or Are They a Unique Case of the Natufian of the Levant?

Miriam Belmaker

Department of Anthropology, University of Tulsa, Tulsa OK, USA

A seminal study in the origins of sedentism was that of Tchernov. Tchernov (1984, 1991) looked at the increase in abundance of commensal species such as the mouse, rat and sparrow as indicators of early sedentism. While the theory has been critiqued based on aDNA evidence of the evolution of the genus *Mus* (Tangri and Wyncoll 1989, Wycoll and Tangri 1989) the issue has not been revisited in nearly 2 decades despite advances in both micromammal taphonomy and evolutionary studies of the species. Moreover, much the argument presented in the original study was based on evidence derived from the Natufian in the Mediterranean region of the Levant. Since then a wealth of micromammal studies in xeric and semi arid regions on the Levant have suggested that the issue may be more complex than previously assumed.

This study presents a synchronic and diachronic study of the microvertebrate communities dating from the late Upper Paleolithic through late Neolithic obtained from the literature and studied by the author. The paleoecological reconstruction of the microvertebrate remains for each site was compared to paleoclimate models from independent sources. The taphonomic pathway of each assemblage was determined to remove possible biases and allow for robust inter-site comparisons. Results suggest that during this period, the distribution of commensal species was heterogeneous among different habitats and may have been associated with other causes and not only sedentism per se. This cautions in using commensal species as a universal indicator for sedentism.

References:
From Daily Life to Ritual in the Late Second Temple Period: Comparing Qumran and Jerusalem City Dump Assemblages

Ram Bouchnick

Zinman Institute of Archaeology, University of Haifa, Haifa and Land of Israel Studies, Kinneret College, Sea of Galilee, Israel

This paper provides preliminary results of the ongoing analysis of faunal remains from Qumran (Judean desert, Israel). The research summarizes the findings from the Late Second Temple Period, focusing on a unique phenomenon of animal bone burial in clay plains, in the Qumran plateau. The research goal is to study the social and cultural habits of the Qumran inhabitants, by analyzing their animal consumption, using taphonomic properties of the buried animals. The findings indicate a high degree of exploitation of livestock species, including sheep and goats (77%), followed by cattle (21%). Interestingly, Gazelle, which is a wild animal, comprises 2% of the assemblage. These findings exclude the possibility that the unique phenomenon of bone burial in clay plains is associated with sacrifice, since it is prohibited to sacrifice wild animals in Judaism. In addition the absence of pig indicates that the Roman legion did not produce this bone assemblage. The consumption patterns of the Qumran inhabitants were compared with those found in the city dump of Jerusalem, the largest Jewish center of this period.
The Climate in the Mediterranean Levant during the Younger Dryas: The Micromammal Evidence*

Ashley Brown and Miriam Belmaker

Department of Anthropology, University of Tulsa, Tulsa OK, USA

A largely debated topic is the paleoclimate during the Younger Dryas (YD) at ca. 13 cal. bp. It has been argued that a link between the aridity of the YD and resource stress affected the Natufian populations, which may have led to the emergence of Neolithic domestication. In the Mediterranean region, there are considerable local variations in environment due to differences in topography and microhabitats. Thus, there is no consensus in the literature that the paleoenvironmental reconstruction of the Levant is indeed cold and arid. Others have suggested that it may be cold and wet.

In order to acquire a more robust reconstruction of a regional paleoenvironment within the Mediterranean Levant, we advocate using micromammal communities as a paleoecological proxy. In this study, we reconstruct the paleoecology of the Mediterranean region of the Levant dating from 20 – 10 ka cal bp (pre and post dating the YD) using micromammal assemblages. Data was retrieved from sites analyzed and augmented by data from the literature.

Results suggest that while the overall species composition was similar throughout the Mediterranean region in the Levant, during the YD, the Syrian squirrel was present in several sites where it is absent today. This indicates that the climate during the YD was colder and wetter than the climate today and that the habitat was more arboreal. Such results suggest that we need to evaluate the role of aridity in the onset of domestication.
Late Bronze Age IIA (LBIIA; ca. 1300-1200 BC) is the final phase of Bronze Age occupation in the ancient city of Alalakh (Amuq Valley, Hatay, Turkey). The LBIIA was a period of great turmoil in Anatolia and Northern Syria, which resulted in the ‘invasion’ of Alalakh by the Hittites and its final abandonment. Recent Koç University excavations at the site revealed possibly military, household and public architectural remains dating to the final phase of occupation at Bronze Age Alalakh. In this paper we explore the zooarchaeological possibilities of assessing the diversity of social groups (ethnic, language, economic) that are known to have lived in Alalakh at the time. We pay special attention to the taphonomy of the zooarchaeological remains and to the archaeological interpretations of single contexts.
'The Place with Beads': A Preliminary Study of Fish and Mollusca Remains from the Excavations at Boncuklu, Central Anatolia*

Ruby Ceron-Carrasco

School of History, Classics and Archaeology University of Edinburgh, Scotland

The Central Anatolian region of Turkey has produced evidence of one of the earliest transitions from hunting and gathering to village farming in the world. The archaeological site of Boncuklu is an ancient settlement mound, located in Central Anatolia near the modern city of Konya and just north of the famous ancient site of Catalhöyük.

Boncuklu, or 'place with beads' in Turkish, is so called by the local villagers because the surface of the site glistens with prehistoric beads following the spring rains.

The Boncuklu project is investigating the appearance of the first villages and farmers in this region. The site has been excavated since 2006. This presentation offers a preliminary assessment on the significance of the presence of marine shell beads as well as freshwater molluscs and of fish remains.
Worlds within Worlds: Far-Flung Distributions and Narrow Manufacturing Traditions in Worked Osseous Materials in the Late Chalcolithic of Southwest Asia

Alice M. Choyke

Medieval Studies Department, Central European University, Budapest, Hungary

Choices and forms of bone tools tend to be quite conservative within relatively narrow zones of traditional manufacturing. However, the late Chalcolithic in Anatolia and beyond is a time of great social complexity. Through trade, warfare and travel people would have had the chance to see new styles of doing things and pick up on innovations and fashions. Although choices of raw material and morphological details can follow traditions of local manufacturing within a settlement context their form and function also seems to be shaped by far-flung expectations of technical style and requirements. Thus, people continue to make bone tools according to accepted local tradition but they also use and produce bone objects that reference larger identities beyond the narrow, local confines of the settlement, worked osseous materials that could be recognized over far-flung regions. The paper will focus on some aspects of the bone tool assemblages from three very different sites: the late Chalcolithic levels at the small tell site of Horum Höyük in Turkey near Gaziantep; the final Chalcolithic levels at the large tell site of Arslantepe (east-central Turkey near Malatya) with the first monumental architecture; and finally the late Chalcolithic levels from Godedzor in southern Armenia, a small summer encampment of pastoralists probably coming from the plains of northern Iran.

The period is generally one of great social complexity across Southwest Asia. It is argued that while there are obvious local differences in technical style especially in the matter of manufacturing household tools for daily life, other special osseous object forms appear over wide areas with their meaning and use being understood in largely the same ways – even if it is not clear how they were precisely used.
The Crusader period at Caesarea lasted 80 years. During this rather brief time in the life of the city, the Crusader presence made itself known in a number of ways. High relative frequencies of pigs and sheep suggest a diet heavy in pork and mutton. The common presence of large dogs, horses and wild hunted species may indicate the practice of Northern European nobility of hunting on horseback using dogs. Large numbers of animal bones both hunted and domestic that would be considered feast food by Europeans are commonly found together with a single provenience. These are probably the remains of banquets in which very young and hunted animals were served whole European style. Taken together the faunal data offer us a glimpse of transplanted foreign traditions in a culture otherwise alien to the ancient city.
Class and “Romanization” in Late Roman Egypt: Issues of Identify and the Faunal Remains from the Site of Amheida in the Dakleh Oasis, Western Egypt

Pam J. Crabtree

Center for the Study of Human Origins, Anthropology Department, New-York University, New-York, USA

The site of Amheida, a Late Roman site in the Dakleh Oasis in Western Egypt, has been excavated by Prof. Roger Bagnall of New York University since 2001. Excavations at the site, known in antiquity as Trimithis, have focused on three areas. Substantial animal bone collections have been recovered from two areas within the site. Area 2 represents a large and well-appointed villa (town house) with extensive wall paintings, while Area 1 was a more modest middle-class home. Comparison of the two assemblages allows us to address possible class differences in animal use and diet in Late Roman Egypt. The question of “Romanization” is a contentious one that has challenged scholars working in various regions of the Roman Empire. This presentation will ask whether and to what extent the diet choices made by wealthy and middle-class households at Amheida represent expressions of Roman identity.
Morphological Variability of the Mesopotamian Fallow Deer (*Dama Dama Mesopotamica*) in Cyprus from its First Introduction until the Bronze Age (Ca. 8000-2700 Cal BC) 

Daujat Julie¹, Dobney Keith² and Vigne Jean-Denis¹

¹ UMR 7209 (CNRS/MNHN) “Archéozoologie, archéobotanique: sociétés, pratiques et environnements”, Muséum national d’Histoire naturelle, Département Ecologie et gestion de le biodiversité, Paris, France
² Department of Archaeology, School of Geosciences, University of Aberdeen, Aberdeen, Scotland

Although an endangered species nowadays, the Mesopotamian fallow deer (*Dama dama mesopotamica*) has played a major role in numerous Late Glacial and Early Holocene human societies in the Near and Middle East. Introduced to Cyprus at the beginning of the Neolithic, the Mesopotamian fallow deer became especially important to the early prehistoric settlers of the island as a source of hunted meat, a subsistence strategy, which continued until the Bronze Age.

The lack of systematic research on both the rare modern comparative specimens, and archaeozoological remains of this species over its entire geographic and temporal range using a standard methodology, has meant that the story of this near extinct species has still to be fully told. The impressive archaeozoological collections from Cyprus provide one of the most important opportunities to explore this important human/deer relationship over a long time period of the Holocene (Early Neolithcic until the Bronze Age).

In contrast to research based on non-endangered species, this research is hampered by the small number of recent/modern comparative specimens available for study of Mesopotamian fallow deer which almost became extinct 60 years ago and the unreliable nature of any associated information. With these caveats in mind, however, this research aims to provide the first baseline morphometric reference for the Mesopotamian fallow deer, using both standard and novel techniques.
Some of the large mammals of late Pleistocene Portugal, like those in Israel, became smaller after the end of the last Ice Age. This size change may be associated with a change in the environment like an increase in temperature. A detailed study of red deer, *Cervus elaphus*, from archaeological sites in Portugal reveals that not only did this animal undergo a great size decrease at the end of the Pleistocene but that it subsequently recovered some of its former size by Chalcolithic times. Portuguese wild boar and aurochs may have followed a similar course. It is possible that these animals became small after the Ice Age when temperatures rose and then underwent a further size decrease in the Mesolithic only to recover some of their former size afterwards. In Israel, aurochs bones from the Early Bronze Age also show evidence for a post-Natufian size recovery. In 1970 Magnus Degerbøl noted a diminution of the aurochs in Denmark after the Maglemosian (9500-6500 BC) so that specimens from the shell-midden or Ertebølle (5300-4000 BC) culture are small. Umberto Albarella and others have remarked upon a size recovery of wild boar in Italy after the late-Neolithic. We ask why did certain mammals become even smaller in the Mesolithic/Natufian? One possible explanation, and the one we prefer (there are others), for Mesolithic size depression is that it was caused by overhunting - today a disproportionately high harvest of adult wild boar is considered to lead to a decrease in their body size. If indeed overhunting occurred in the Mesolithic/Natufian then this corroborates previous interpretations of the increase of small game (Flannery’s ‘broad spectrum revolution’) and juvenile gazelles in the Natufian and Pre-Pottery Neolithic-A. In Portugal too we see a shift to ‘r’-selected animals like the wild boar and an increase in the proportion of juveniles culled in the Mesolithic as well as a huge increase of molluscivory. If correct, these speculations could help to explain why people were forced to take control of their sources of animal protein in the Neolithic – i.e., begin domesticating food animals.

References:
A Soup Kitchen in the Eastern Suburbs of Ancient Sagalassos, Turkey? The Evidence of Animal Remains and Material Culture*

Bea De Cupere\textsuperscript{a}, Sheila Hamilton-Dyer\textsuperscript{b} and Jeroen Poblome\textsuperscript{c}

\textsuperscript{a} Royal Belgian Institute of Natural Sciences, Brussels, Belgium
\textsuperscript{b} University of Southampton, Southampton, UK
\textsuperscript{c} Katholieke University of Leuven, Leuven, Belgium

Ongoing excavations in the eastern suburbia of Roman Imperial Sagalassos (SW Turkey) have resulted in the discovery of a building for which the function of meeting hall of a so far unidentified association has been proposed. The identification is partly based on the presence of waste dumps outside the building. Our poster focuses on the dump found against the outer side of the eastern wall, containing a considerable amount of animal remains and ceramics. The archaeozoological analysis shows that the largest part of the faunal material consisted of the remains of cattle and pig, while the bones of sheep/goat were much less numerous. Most of the cattle bones showed butchery traces, indicating that the meat was cut off the bones and subsequently chopped into pieces. Preliminary results suggest that only older animals were consumed. The pottery assemblage was a specific selection of types of tableware, mostly of secondary quality. The presence of a range of completely preserved vessels is indicative of non-random waste practices, possibly to be linked with the structure against which the dump was thrown. Combining these results, the dump was interpreted as the waste of a soup kitchen, datable to the second half of the 2\textsuperscript{nd} century AD and implying accumulation while the building was still in use.
Human Animal Interactions during the Harappan Period in the Ghaggar Region of Northern India, Insights from Bhirrana

Arati Deshpande-Mukherjee

Department of Archaeology, Deccan College Post Graduate and Research Institute, Yerwada, Pune, India

In recent years the Ghaggar region of Northern India has yielded numerous sites associated with different phases of the Harappan civilization such as Kalibangan, Bhagwanpura, Banawali, Balu, Kunal, Rakhigarhi, Bhirrana, Farmana, etc. These are providing us with fresh new data regarding the origin and development of the Harappan culture in this region. Some like Kalibangan, Kunal, Bhirrana have revealed early levels of occupation preceding the Mature Harappan period. The sites characterized by their large size settlements, mud brick structures, ceramic assemblages, seals and association of human burials have also yielded faunal assemblages. Studies regarding them have been limited, hence the ongoing faunal research at Bhirrana is significant. The exploitation of a wide spectrum of animals ranging from wild to domestic types is evident. The presence of cattle and small ruminants in the early levels indicates a mixed subsistence economy of hunting, herding and stock rearing. Attempts are being made to study the various ways in which different animals were used from the early occupation of the settlement to its Mature Harappan phase. These are hoped to provide suitable insights into the development of Human-Animal relationship in this region during the Harappan period.
Pigs from the Near-East: Identification and Morphological Change through Time
Allowen Evin\textsuperscript{a,b}, Linus G\textsuperscript{I}rdland Flink\textsuperscript{c,d,e}, Thomas Cucchi\textsuperscript{b,a}, Guy Bar-Oz\textsuperscript{f}, Lidar Sapir-Hen\textsuperscript{g}, Meirav Meiri\textsuperscript{g}, Greger Larson\textsuperscript{c} and Keith Dobney\textsuperscript{a}

\textsuperscript{a} Department of Archaeology, University of Aberdeen, Aberdeen, United Kingdom
\textsuperscript{b} CNRS-Muséum National d'Histoire Naturelle, Archéozoologie, histoire des sociétés humaines et des peuplements animaux, Paris, France
\textsuperscript{c} Durham Evolution and Ancient DNA, Department of Archaeology, Durham University, United Kingdom
\textsuperscript{d} School of Biological and Biomedical Sciences, Durham University, United Kingdom
\textsuperscript{e} Earth Sciences Department, Natural History Museum, London, United Kingdom
\textsuperscript{f} Zinman Institute of Archaeology, University of Haifa, Haifa, Israel
\textsuperscript{g} Institute of Archaeology, Tel-Aviv University, Tel-Aviv, Israel

The wild boar, \textit{Sus scrofa}, was independently domesticated several times across the Old World. In the West Palaearctic, the history of pig domestication is complex and includes local domestication and dispersal. Identifying domestication is particularly challenging for archaeologists because of the fragmentary stage of the remains and the subtle differences between wild and domestic forms. Here we explore the process of pig domestication in the Near East and Europe using morphometric techniques coupled with ancient DNA (aDNA). We describe a novel method to discriminate wild from domestic pigs based on molar size and shape, and demonstrate that both large and small domestic pigs existed from the Neolithic to (at least) the Bronze Age. We conclude that wild/domestic status determinations based solely on traditional metric methods provide an oversimplified perspective of the domestication process.
Making the Cut: Changes in Butchering Patterns from the Early Bronze Age and later Periods at Tell Halif

Haskel Greenfield, Annie Brown, and Anna Borren

Department of Anthropology, University of Manitoba, Winnipeg Canada

Tell Halif is a prominent settlement located in the Judean hills overlooking the foothills and the coastal plain of Philistia in southern Israel. The site has been inhabited since the Chalcolithic and served as an important economic center since the beginning of the Early Bronze Age (Phase I). Faunal remains with evidence of butchering were recovered by the Lahav Archaeological Research Project between 1976 and 1987. The focus of this paper is to describe and interpret the changes in butchering patterns through the Bronze Age (3500 – 1200 BCE) and later periods at Halif.

Several results were obtained from this study. First, the ratio of wild and domestic species butchered changes over time, as domestic species replaced the wild species. Second, the use of stone tools becomes dramatically less frequent with the advent of the Middle Bronze Age. By the end of the Late Bronze age, stone tools were mostly replaced by metal tools during the butchering process. Third, metal blades appear to be used for butchering much later in time, contrary to previous assumptions. Fourth, the transition from stone to metal technology resulted in changes in efficiency of the butchering process (fewer marks/bone). Fifth, there is a shift to a more systematic butchering process with the transition from Bronze Age to Iron Age (greater standardization in location of marks). The analysis of butchering technology and butchering process allows for a unique perspective on the economic and political changes occurring between the Early Bronze and later periods in the Levant.
Preliminary Analysis of the Fauna from the Early Bronze Age III Neighbourhood at Tell Es-Safi/Gath, Israel

Haskel J. Greenfield¹, Annie Brown¹, Itzhaq Shai² and Aren M. Maeir³

¹ Department of Anthropology, University of Manitoba, Winnipeg, Canada
² Israel Heritage, Ariel University, Ariel, Israel
³ Department of Land of Israel Studies and Archaeology, Bar-Ilan University, Ramat-Gan, Israel

This paper describes the analysis of the zooarchaeological assemblage from the recent excavations of the Early Bronze Age III neighbourhood at Tell es-Safi/Gath, Israel. The site is a major urban centre for the region during the EB III, probably just below Yarmouth in the regional hierarchy, and was surrounded by a large fortification wall. This neighbourhood was probably inhabited by an emerging class of merchants. It contains a layout of houses that is common for other EB urban centres in the region, including sturdy small multi-room houses, with a courtyard, and in few cases a small storage room. Occupants had access to long-distance and local trade goods, used various recording methods, and sacrificed expensive animals best known for transporting goods.

Most of the remains are mammals (99% NISP), with domestic caprines (sheep and goat) pre-eminent (71%), followed by cattle, dog, pig and ass. Wild taxa include hartebeest, roe deer, fallow deer, gazelle, hare, and birds. A far larger number of culturally modified remains are identified than are normally noted in assemblages (27%). A domestic ass/donkey was buried in a shallow pit beneath the floor of a house. It was in full articulation, except for the neck and head, which were found lying on the ribs as if the head had been cut off before burial. It was clearly sacrificed. This is one of the earliest complete domestic ass skeletons from the region and the first to be found buried within a domestic depositional context.
A Taphonomic and Technological Analysis of the Butchered Animal Bone Remains from Atlit Yam, a Submerged PPNC Site off the Coast of Israel* 

Haskel J. Greenfield¹, Trent Cheney¹ and Ehud Galili²

¹ Department of Anthropology, University of Manitoba, Winnipeg, Canada
² Israel Antiquities Authority, Jerusalem, Israel

This paper examines the butchering patterns at the submerged Pre-Pottery Neolithic C site of Atlit Yam off the coast of Israel by analyzing the subset of the butchered zooarchaeological remains. First, the taphonomic processes which affected the faunal assemblage are analyzed to help understand the limitations of the study. Second, the distribution and nature of the grooves on the bones that are related to butchering slicing activities are subjected to analysis in order to understand the butchering process and technology. Related issues to be discussed include quantification procedures, spatial distribution of activities and the temporal changes evident in the assemblage.
The Palace Vs. The Home: The Identification of Status from the Analysis of Animal Bones from an Assyrian Provincial City

Tina Greenfield

Division of Archaeology, University of Cambridge, Cambridge, United Kingdom

Through zooarchaeology it is possible to identify the economic strategies and social relationships that occurred between people from ancient settlements. Differences in availability and access to resources between behaviourally distinct areas of archaeological sites (e.g. low versus high status, public versus private, domestic versus industrial and administrative) can be used to infer the nature of the political economy of imperial cities at a level of detail not previously visible. Zooarchaeological data from one of the earliest Old World empires (Late Assyrian Empire, 900-612 BCE) will be used to recognize signatures of elite and domestic diets within an imperial center. Large-scale excavations at the provincial capital site of Ziyaret Tepe, SE Turkey exposed a variety of behaviourally distinct contexts across the site, which are considered representative of the social, economic and political hierarchy inherent in the Assyrian Empire. The results enable a reconstruction of the patterns of animal exploitation within and between households, and the Palace; and help to more fully understand issues of social stratification within this Imperial city. Ultimately, this information can inform on the extent of the political economy of an ancient Near Eastern empire.
The Zooarchaeology of Tel 'Eton: Preliminary Analysis*

Tehilla Gugenheim¹, Avi Faust¹, Ram Bouchnick²,³ and Guy Bar-Oz²

¹ The Martin (Szusz) Department of Land of Israel Studies and Archeology, Bar- Ilan University, Ramat-Gan, Israel
² Laboratory of Archaeozoology, Zinman Institute of Archaeology, University of Haifa, Haifa, Israel
³ Land of Israel Studies, Kinneret College, Sea of Galilee, Israel

This paper provides preliminary results of our ongoing analysis of faunal remains from the site of Tel 'Eton (Southeastern Shephelah, Israel). The research covers the finds from the Late Bronze, Iron Age I, Iron Age II and the Persian Period strata, and aims to analyze the social and cultural character of the site's inhabitants and, when possible, to examine the use of space within the different phases. Generally speaking, the finds attest to a high degree of continuity in the exploitation of animals through the studied periods. Sheep and goats comprise the major livestock species (ranging from 73% - 79%), and this is followed by cattle (13%-19%). All other species are quite rare in the archaeological record. Some of these exotic species are the Nile perch vertebrae that were revealed in different areas of the site, a few bird bones and one bear bone (Radius) from area B, dated to the Late Bronze. The rarity of pigs (less than 1% in all periods), which is characteristic of both Canaanites and Israelites at those periods, should be noted. It is the aim of the research to examine similarities and differences in animal exploitation both through time (i.e., from the Late Bronze Age to the Persian period) and through space (i.e., between different households and neighborhoods).
Our knowledge of the societies in transition from the Neolithic to the Early Bronze Age in Attica is currently limited, and almost non-existent on issues relating to human-animal relations. A first study of reliably large assemblages from the area sheds light on a variety of issues, previously unaddressed. The results showed a well-developed agropastoral economy with high level of husbandry knowledge and a society showing the first signs of complexity. There are indications for periodical communal meals expressed either as mortality peaks, structured deposits or in general out-of-the-ordinary consumption of animals. Beyond socioeconomic issues, this paper also evaluates the strong evidence for dog consumption, in at least one of the studied assemblages. Dogs were systematically bred and consumed by the inhabitants as evidenced by their relatively large numbers and extensive butchery marks on their bones. Cynophagy was also exercised during the Neolithic in Greece, though not so extensively. This paper synthesizes the evidence from faunal remains to draw a first picture of Early Bronze Age Attica and the identity of its inhabitants.
Animal Exploitation at an Early Sedentary Village on Upper Tigris: Faunal Remains from Hasankeyf Höyük (Batman, Turkey)

Hitomi Hongo¹, Saiji Arai², Can Yumni Gundem³, Yutaka Miyake⁴ and Ken-ichi Tanno⁵

¹Department of Evolutionary Studies of Biosystems, Graduate University for Advanced Studies, Shonan Village, Hayama, Kanagawa, Japan
²Graduate School of Humanities and Sociology, Tokyo University, Tokyo, Japan
³Faculty of Arts and Sciences, Batman University, Merkez Yerleşkesi, Türkiye
⁴Graduate School of Humanities and Social Sciences, University of Tsukuba, Tsukuba, Japan
⁵Department of Agriculture, Yamaguchi University, Yamaguchi, Japan

Hasankeyf Höyük is a Prepottery Neolithic site located on the left bank of the Tigris, in Batman Province, Turkey. The site was first excavated by a Turkish team in 2009, then since 2011 the excavation has continued by a team from University of Tsukuba, Japan. It is a mound about 150 meters in diameter and 8 meters high. Archaeological layers are dated to the 10th millennium calibrated BC, indicating that the site is contemporary with Hallan Çemi, Demirköy Höyük, Körtik Tepe, and Gusir Höyük in the Upper Tigris Valley.

A large quantity of animal bone remains were excavated from Hasankeyf Höyük. Wild sheep is dominant, but wild boar, wild goat, and red deer are also abundant. Gazelle bones are also occasionally found, but aurochs is very rare. Also noted is the large number of bird and fish bones. Relative abundance of animal taxa found at the site as well as the size range of the main species will be discussed in the paper. Morphological evidence of domestication was not observed in these ungulate bones. Resource exploitation patterns of the early sedentary village in the upper Tigris Valley will be discussed combining zooarchaeological and archaeobotanical evidence from the site.
"Dead Bones Can Talk" – An Answer to Open Questions Using Ancient DNA Studies

Gila Kahila Bar-Gal

The Koret School of Veterinary Medicine, The Robert H. Smith Faculty of Agriculture, Food and Environment, the Hebrew University of Jerusalem, Rehovot, Israel

The unique collections of Israeli archaeological and historical treasures, together with advanced technologies, enable us to study human evolution, animal biodiversity and development of cultures through multidisciplinary research. Ancient DNA (aDNA) technologies have made it possible to recover DNA from ancient samples and created a new way to study human and animal history. Recovered aDNA provides a window to the past, presenting unique, quantitative data about the genetic links of extinct or historic organisms. Ancient data can provide a direct analysis of evolutionary changes at the molecular level and presents direct evidence of genetic changes over a specific time period, and their relationship to known events.

We are interested in characterizing the DNA barcodes of unique collections of Israeli archaeological and historical treasures using advanced aDNA methodologies. Genetic identification of these specimens to the level of species, populations and individuals assisted in answering unresolved questions such as: the origin of the Dead Sea Scrolls, equids identification in the Crusader castle of Vadum Iacob (1179) and their origin, transmission of infectious and zoonotic diseases since the Neolithic period and more. The results of the various aDNA studies contributed to the creation of a detailed picture of selected previously open historical questions concerning human cultures in the southern Levant.
A New Look at the Shell Beads from Sefunim Cave, Mount Carmel (Israel)*

Andrew W. Kandel¹, Ron Shimelmitz² and Avraham Ronen²

¹The Role of Culture in Early Expansions of Humans (ROCEEH), Heidelberg Academy of Sciences and Humanities at the University of Tübingen, Tübingen, Germany
²Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

The excavations at Sefunim Cave in Mount Carmel (Israel) revealed well stratified cultural deposits spanning the Middle and Upper Paleolithic, with further indications of Epi-Paleolithic and Neolithic occupations. The excavator (AR) recovered shell beads mainly from the Upper Paleolithic through Neolithic layers. Here we discuss the nature and context of these shell beads. With the exception of a single perforated Nassarius gibbosulus shell from the Middle Paleolithic layer 13, the Upper Paleolithic shell ornaments come from layers 8 and 9 and include three N. gibbosulus, nine Columbella rustica, one Conus sp. and seven Dentalium sp. Additionally, the marine fauna includes two bivalves and one fish vertebra. Most of the gastropods have been intentionally perforated, and the small size of these species likely precludes their use as food. Therefore, we consider them all to be shell ornaments. Whether the specimens were captured live or collected from beach deposits, these shells represent one of few documented examples of marine resource exploitation along the Mediterranean during the Upper Paleolithic. The shells also allow us to make inferences about the prevailing marine ecosystem, which seems to have been constant over time and similar to today. At Sefunim, shells from later periods become more numerous and additional species are present. This trend allows us to make diachronic comparisons to examine the changing social structure and cultural diversity of these early inhabitants of the Mediterranean coast.
Pilgrims, Scallops and Tax Evasions in the 13 century AD
Inbar Ktalav

Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

During the 13th century the pilgrimage phenomenon became widespread. People went on long pilgrimages in order to purify their souls, for penance and contact with sites of religious significance. Via pilgrimage, the pilgrim could personally, both physically and spiritually, experience the way () of the saint he followed (Jesus or saints of the church). Some people were not satisfied with one pilgrimage and made the pilgrimage a way of life. Upon reaching the site of pilgrimage, the pilgrim acquired a symbolic object that was used to prove the existence of the journey. The symbol gave its owner benefits such as safe passage, room and board, and in addition, some of the sacred attributes of the saint. One of the most important pilgrimage destinations in the 13th century was Santiago de Compostela in Spain, the burial place by faith, of St. James of which the pilgrimage symbol is the oyster known today as – coquille san-Jacque. This bivalve was discovered in a few excavations in Israel and it illuminates not only the practice of pilgrimage, but also reveals a complex system of fraud, monopolies, power struggles and tax evasion around the symbol of pilgrimage.
Unified Examination of Ceramic and Faunal Remains, Case-Study from Tel Aphek (Israel)*

Assaf Kleiman

Department of Archaeology and Ancient Near Eastern Cultures, Tel-Aviv University, Tel-Aviv, Israel

Ceramic and faunal remains comprise the majority of finds discovered in archaeological excavations. Nonetheless, the analysis of these finds is rarely done jointly. In most cases the finds are separated and sent to different specialists, which produce separate reports. The current research was based on a unified study of ceramic material combined with an examination of the animal remnants from the Iron Age IIA strata of Tel Aphek. This complex tell is one of the key archaeological sites on the central coastal plain of Israel, situated at the main sources of the Yarkon River and guarding the international road from Egypt to the north. Its strategic location has attracted human settlers for almost five millennia. Tel Aphek has been excavated from 1972 to 1985 on behalf of the Institute of Archaeology of Tel Aviv University. The exposed Iron Age IIA layers at the site yielded large assemblages of complete vessels (e.g., storage jars, cooking pots) and faunal remains which represent a typical Iron Age subsistence economy. The large exposure of the site allowed the study of a variety of archaeological contexts such as domestic floors, silos and open courtyards. While highlighting the mutual contributions of the finds, the research achieved a richer image of foodways, site-formation-processes and other activities which took place in Iron Age IIA Aphek.
High-Resolution Faunal Data from Settlement Horizons at Oymaağaç Höyük (Turkey)

Günther Karl Kunst

Vienna Institute of Archaeological Science, University of Vienna, Vienna, Austria

At Oymaağaç Höyük (Turkey, province Samsun), long-term archaeological investigations are carried out by R. Czichon and J. Klinger (FU Berlin). An identification of the settlement hill with the Bronze Age Hittite city of Nerik is corroborated by finds of cuneiform tablets. In the field season 2012, all animal remains (>4,000 specimens) from area 7389 were studied. This area is situated at the north-eastern periphery of the settlement hill and yielded 89 loci, 48 of which contained faunal material. Most contexts represent surface deposits and pits outside of buildings. According to the associated pottery, the assemblages belong to the Bronze Age (4 samples) and Iron Age (8) occupation periods, a reliable dating is not possible for the remaining contexts.

All samples are dominated by the main domestic mammals. Other species, like equids, wild mammals and birds appear as accessorital elements or were found to be accumulated within certain contexts. Cervids are only represented by worked and unworked antler fragments. Partial skeletons of snakes and frogs and other microvertebrates derive both from undated occupation surfaces and Iron Age pits. Bone artefacts and manufacture waste are mostly restricted to well-dated contexts from the Iron Age. The interrelationships between faunal composition and diversity on one hand and feature type and chronological position on the other exhibit a pattern which, due to the limited area studied, is not yet fully understood. It is also shown how faunal analysis can deal with, and benefit from, an accessible archaeological database, especially within a complex settlement situation.
Social and Economic Significance of Dentalium Shells for Hunter-Gatherers in the Southern Levant

Aldona Kurzawska¹ and Daniella E. Bar-Yosef Mayer²

¹ Department of Applied Sciences, Institute of Archaeology and Ethnology, Polish Academy of Science, Warsaw, Poland
² Zoological Museum, Steinhardt National Collections of Natural History, Tel Aviv University, Tel-Aviv, Israel

Scaphopod shells (commonly known as *Dentalium* shells) were the most frequently used shells by the Late Epipalaeolithic Hunter-Gatherer societies in the Southern Levant. People preferred them above others and used them as personal adornments. Certainly they bear specific cultural meanings: individual, social, economic, and ideological. The current in-depth study of the scaphopod shells in archaeological context from Late Pleistocene/Early Holocene sites in Israel: Urkan e-Rub IIa (Kebaran), Hayonim Cave, Eynan, Hilazon Tachtit Cave and Raqefet Cave (Natufian), Gilgal (Final Natufian & PPNA) and Ramat Harif (Harifian) will enhance our understanding of the role they played in prehistoric societies in the Levant.

Previous studies determined that scaphopod shells were obtained from three different sources: the Mediterranean, the Red Sea and Pliocene formations. Our research indicates that in each of the archaeological sites the majority of scaphopod shells in the assemblages derived from the nearest source and belong to species that were probably the most easily accessible. Prehistoric humans chose among the scaphopods specific species to be used as beads, and in the Early Natufian used them separately in burials. There is a sudden absence of shells in the burials of the Late Natufian period occurring together with along the appearance of scaphopod shells acquired from distant sources. These might reflect increased mobility or exchange of goods during the Late Natufian, as well as social and economic change in these societies.
A New Synthesis for Aging Prehistoric Pigs (*Sus scrofa*): Consolidating Tooth Eruption and Attrition Studies

Ximena Lemoine¹, Katelyn Bishop² and Scott Rufalo¹

¹ Program of Human Ecology and Archaeobiology, National Museum of Natural History, Smithsonian Institution, Washington DC, USA
² Department of Anthropology, UCLA, Los Angeles, USA

Reconstructing demographic profiles is valuable for revealing animal exploitation strategies at archaeological sites. For pig (*Sus scrofa*), the method presented by Grant (1982) demonstrates a promising technique for estimating age through molar wear pattern analysis. Grant’s study is, however, limited: (1) it requires complete or nearly complete mandibles; (2) it uses exclusively mandibular teeth; and (3) it offers only a relative scale for aging. While some work has been done to calibrate wear stages with actual ages, a standardized methodology for using tooth wear to age pigs remains to be developed. This study presents a new synthesis addressing the limitations of Grant’s work and bringing together data from both dental eruption and attrition studies to provide useful age classes. Using age data derived from the application of this method, we construct survivorship curves for two Halafian sites (Umm Qseir and Banahilk) with domestic pig populations, one a 3rd millennium BC site with a heavily managed pig population (Leilan), and one an Epipaleolithic site (Hallan Çemi), where pig management is contentious. The results of these case studies demonstrate the ability of this method to reliably reconstruct age demography and distinguish age profiles between sites with different animal procurement strategies. This method provides a standardized means of collecting accurate and reliable age data crucial in examining patterns of prehistoric pig exploitation.
Fish Remains from the Iron IIb Period in the City of David, Jerusalem

Omri Lernau¹ and Ronny Reich¹

¹ Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

A well-dated fill under an early Iron IIb building inside the so called "rock cut pool" in the City of David, yielded 10,600 remains of fish for analysis. The main identified kinds of fish were porgies, mullets and catfish. Eleven other families of fish were represented in this assemblage, including fish imported to Jerusalem from the Nile. The same fill contained a large number of broken bullae, some carrying Phoenician and fishermen's motifs. This association suggests that the fill was part of a dump, which had belonged to an administrative center that served as the receiving station for goods delivered to the city. It also hints at the possibility that the point of origin of the fish was in Phoenicia, as part of a well established Phoenician influence on the kingdoms of Judea and Israel at the time.

A prominent feature of this assemblage was the small estimated size of almost all the fish, rarely exceeding 45-50cm. This was true not only for small kinds of fish, but also for those that in other excavated sites were represented by much larger sizes. The significance of this finding to the trade with the city will be discussed in the presentation.
Philistine Diet, Population Origins, and Ethnic Boundaries

Justin E. Lev-Tov

Statistical Research, Inc., Redlands, California, USA

This paper is about the diet of those people who apparently settled in the southern coastal plain of what is today Israel at the end of the Late Bronze Age/beginning of the Iron Age, ca. 1200 B.C.E., establishing there an alliance of ethnically similar cities referred to as Philistia by scholars. Archaeologists and zooarchaeologists have discussed the unique diet of the Philistines repeatedly over the past 25 years, but the evidence discussed previously has come mainly from one site, Tel Miqne-Ekron, and unspecific reports of bone assemblages from other, neighboring, sites. Here, the trends visible through time in a sample of the faunal remains from Tel Miqne-Ekron are compared with those from Tel es-Safî/Gath in order to better establish what the Philistine meat diet comprised both on a greater than single site scale, and through time. In addition, the diet of the early period Philistines is compared to data from other areas outside Philistia, in order to address the topic of population origins vs. competing explanations for observed dietary phenomena. Finally, the paper also examines population origins from the perspective of cult sacrifice of animals, a phenomenon heretofore not addressed in relation to this question.
The Early History of Domesticated Cattle in Africa
Veerle Linseele

Center for Archaeological Sciences, Katholieke Universiteit Leuven, Leuven, Belgium
Koninklijk Belgisch Instituut voor Natuurwetenschappen, Afdeling Antropologie en Prehistorie, Brussels, Belgium

For almost four decades, the putative early domesticated cattle of Nabta Playa and Bir Kiseiba in the Western Desert of Egypt (late 9th/8th millennium cal. BC) have caused vivid debates, because, if the identifications are correct, they constitute evidence for the independent domestication of cattle in Africa. Numerous efforts to find other sites that confirm the early presence of domesticated cattle in Africa have been unsuccessful. Secure evidence appears only in the 6th millennium cal. BC. Also at that time the Nabta Playa/Bir Kiseiba area stands out. In this paper, a brief summary of the ongoing debate on cattle domestication and of early cattle finds in Africa will be given as part of an attempt to reconstruct the early history of cattle on the continent in comparison to that in neighbouring regions. Methodological issues typical for northern Africa, such as the poor preservation of ancient DNA in arid areas, distinction of domestic cattle bones from remains of wild bovids etc., will also be addressed.
Animals at the Graeco-Roman town of Karanis (Fayum Oasis, Egypt)*
Veerle Linseele

1 Center for Archaeological Sciences, Katholieke Universiteit Leuven, Leuven, Belgium
2 Koninklijk Belgisch Instituut voor Natuurwetenschappen, Afdeling Antropologie en Prehistorie, Brussels, Belgium

In Graeco-Roman times, the Fayum Oasis in Egypt was developed for agriculture to feed the Ptolemaic, and later the Roman armies. Karanis was one of the important agricultural villages in the area. Its traces of occupation date from the 3rd century BC to the 5th century AD. Preservation at the site is exceptionally good thanks to the arid climate, and it is mainly famous for the finds of papyrus documents. Recent excavations in the different parts of Karanis have yielded faunal remains. Results of the archaeozoological analyses will be presented. Possible interpretations for the particular composition of the fauna, which consistently shows a predominance of catfish and domestic pigs, will be investigated. The discussion will include the identity of the site inhabitants, many of which were veterans and their families.
Animal Bones from Burials of Armenia

Nina Manaseryan

Research Center for Zoology and Hydroecology of Armenian, National Academy of Science, Yerevan, Armenia

Animal bones from burials represent one of the most interesting, yet poorly studied and, at times, most controversial phenomena in archaeology.

In the scientific collections of the Institute of Zoology NAS RA over 14 thousand samples of vertebrate bone remains, excavated from over 20 burials that embrace a wide chronological spectrum were gathered and systematized.

The archaeological excavations at sites of various timeframes discovered complete or nearly complete sets of skeletons of bulls, sheep, horses (burials at Lchashen, Naver, Aghavnatun, Lori Berd), pig and dog skulls (Lchashen, Artik).

Skulls and limb bones of bulls, sheep, goats and pigs were collected in tombs from the drained part of Lake Sevan. Each of the excavated burials contained, as a rule, three to four left-sided ribs, a bull's or cow's thigh bone and two or three sheep skulls.

In a burial mound at Artik, apart from a few bones and astragalus of cattle, vessels also contained skulls of dogs and other typical animal bones.

In burial mounds of ancient Shirakavan, the dog heads were found near the head of the dead. The legs were surrounded by a sheep skull in one case and goat horns in another; a horse head with bronze adornments also lay on an egg-shaped stone.

In July 2008, during the study of the Aghavnatun burial complex, a burial of a horse with a bronze ring attached to a mandible was discovered.

The study of archaeological material found in burials of the Bronze Age and the Iron Age in Armenia brings to light a wide variety of forms and functions in animal burials despite some commonly shared characteristics.
Subfossil Fauna of the Holocene in Lake Sevan Basin*

Nina Manaseryan and Laura Arutyunova

Research Center for Zoology and Hydroecology of Armenia, National Academy of Science, Yerevan, Armenia

The closed mountain basin, the bottom of which is filled with the waters of Lake Sevan, or like they used to call it in ancient times, Geghama Sea holds one of the world's largest high-altitude lakes (situated at the elevation of about 2000 m a.s.l.). The natural landscape of Lake Sevan basin is highly diverse. The western and southern basins of the lake are characterized by typical volcanic relief forms. In many places the eruptions of lava reaching to Lake Sevan had rendered very complex shapes to the coasts, forming multiple bays, creeks and capes. The lake shoreline that was recently exposed above the water levels is formed by sand, clay and gravel deposits.

A natural burial place of bones is concentrated on the south-western coast of Lake Sevan near the village Ahkala (by the Ayrivan monastery). The belt extends along the wave-cut zone all the way up to the cape Noraduz, occupying over 500 m in length and about 50-60 m in width. According to Mezhlumyan (1972) the layers forming the mentioned stratum relate to paleo-fluvial deposits of the early Holocene. These rocks contain animal bone remains, which lay within two strata alternating with diagonally-layered sand. The bone material was collected during expeditions of the Department of Zoology of Vertebrate Animals, Institute of Zoology.

The faunal species composition is rich including remains of *Bison sp.*, *Bos sp.*, *Cervus elaphus*, *Canis lupus*, *Vulpes vulpes*, *Sus sp.*

Ten species of freshwater mussels were also found in silty-sandy rocks of grey colour, with layers of sand, cemented on the remains of mammals. Two of them, *Bithynia troscheli* Paasch, 1842, and *Planorbis carinatus* Muller, 1774, are glacial relicts.
The Faunal Remains from the North Lower City of Zincirli Höyük: Economy, Society and Ritual

Nimrod Marom\textsuperscript{1} and Virginia Herrmann\textsuperscript{2}

\textsuperscript{1}Department of Maritime Civilizations and the Zinman Institute of Archaeology, University of Haifa, Haifa, Israel.
\textsuperscript{2}Department of Anthropology, Dartmouth College, Hanover NH, USA

Recent excavations by the Neubauer Expedition of the University of Chicago at Zincirli Höyük have unearthed a large area of what was the lower city of Iron Age Samal. The analysis of the faunal remains from the excavations reveals a trend of increased specialization of production and participation in state economic networks in this neighborhood with the deepening involvement of the Assyrian Empire in the region. The faunal remains from a probable cult building and from a mortuary chapel shed light on ritual practices and may suggest their Luwian affiliation. The development of the animal economy and cult will be assessed in view of other archaeological evidences from the north lower city of Samal.
European Pigs in the Southern Levant and the Sea People Migration

Meirav Meiri\textsuperscript{1,2}, Steve Weiner\textsuperscript{3}, Dorothee Huchon\textsuperscript{2}, Guy Bar-Oz\textsuperscript{4} and Israel Finkelstein\textsuperscript{1}

\textsuperscript{1}Institute of Archaeology, Tel-Aviv University, Tel-Aviv, Israel
\textsuperscript{2}Department of Zoology, Tel Aviv University, Tel-Aviv, Israel
\textsuperscript{3}Structural Biology, Weizmann Institute, Rehovot, Israel
\textsuperscript{4}Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

Pig remains are abundant in archaeological sites across Israel. However, their abundance varies greatly across sites and between periods. In the Iron Age, for example, pigs’ frequency in archaeological sites depends on the region where the site is located and on the chronological phase within the period. Domestic pig (\textit{Sus scrofa dom.}) bones are fairly abundant in Iron Age sites along the southern coastal plain; a region which at the time was affiliated with “the Sea People”. Pigs, however, are rare or absent in sites in the central hills. The high number of pigs in the so-called “Sea People” sites raises the question of their origin: did the Sea People exploit the local pig breeds, or whether they brought new pig breeds from the Aegean Basin and introduced them into their newly acquired homeland. If they brought pigs with them, what were the cultural boundaries between populations that were raising pigs and those not raising pigs?

In this study, we used modern and ancient DNA techniques to shed light on the origins of the modern wild boar populations, as well as the Iron Age domestic pigs. We collected pig remains from sites across Israel with dates ranging from the Neolithic period up to present and analyzed part of the mitochondrial DNA to be able to follow changes through time.

The results indicate that all modern Israeli wild boar we analyzed, share European haplotypes (a unique genetic signature). This is a unique pattern in the Middle East, where today pigs display local Middle-Eastern haplotypes. In contrast, domestic pigs from Iron Age sites in Israel contain a mixture of Asian (= Middle Eastern) and European haplotypes. These results imply that domestic pig breeds may have been introduced to the southern Levant from Europe by the “Sea People” during the Iron Age. These pigs may have then introgressed into the local fauna, or perhaps ecologically displaced them, bringing about a population turnover – the descendants of which are the only living pigs (and wild boar) in the country.
**Quid novum ad mensam hodie?**

*Food habits in a Roman mansio (Khirbet es-Samra, Jordan).*

Hervé Monchot

Orient & Méditerranée, Labex Resmed, Université Paris IV La Sorbonne, France

In the Roman Empire, a *mansio* (from the Latin word *mansus*, the perfect passive participle of *manere*, "to remain" or "to stay") was an official stopping place on a Roman road or *via* (in our case the *via nova Traiana*, which connected the city of Bostra, capital of the province, to Aila, port on the Red Sea, now Aqaba), maintained by the central government for the use of officials and those on official business whilst traveling.

*Quid novum ad mensam hodie?* So what was the menu when a traveler arrived after a long journey? Indeed, if we could stay and sleep in a *mansio*, we could also find something to eat. This is the question that the archaeozoological study will attempt to answer; it is the study of all the faunal remains that were consumed or at least present in the hostel. The great interest of the *mansio* of Samra is that it represents a unique structure, away from the village, which was not re-used or modified after its destruction. In addition, all the faunal elements were found in the different loci (rooms) of the building allowing or not to confirm the function of each room (e.g., kitchen, stable).

The archaeozoological study (*n* = 5081) shows a predominance of caprids (sheep/goat), followed by chicken, pork and beef. While these animals were likely consumed, the presence of some remains of horses, camel, and dog is more equivocal. Gazelle, hare, ostrich, fishes and seashells were also identified among the bone assemblage. It will be important in future studies to compare the results obtained here with those from Roman levels in the village (e.g., “white” building, or others such as the church) as well as from different periods (Byzantine, Islamic), giving us a clear outline of the evolution of subsistence practices and lifestyle through time.
Tortoise and aurochs remains from two structures at the Late Natufian cave site of Hilazon Tachtit, Israel reflect large-scale butchery, consumption and rapid disposal consistent with funerary feasts (Munro and Grosman 2010). These structures contained human burials and rich material assemblages including flint debitage and tools, seashells, bone tools, and groundstone. The structures also held rich faunal assemblages (NISP ca. 10,000). After the tortoise, the most common species in the structures is the mountain gazelle (Gazella gazella), which typically dominates Natufian assemblages in the Levant’s Mediterranean zone. This paper reconstructs the taphonomic history of the gazelle assemblages from Structure A and Structure B at Hilazon Tachtit to determine whether they were created during the same large consumption event(s) that produced the aurochs and tortoise remains or if they represent food debris accumulated through other activities or secondary deposition. The gazelles in both structures display classic Natufian butchering patterns evidenced by cutmark frequencies, bone breakage and element representation and were clearly butchered, consumed and intentionally disposed. Refits of gazelle bones at distances of up to 30 cm in depth in both structures indicate that the fill was deposited rapidly. However, the assemblages, particularly the one from Structure A, differ from those from other Natufian sites in the high representation of fetuses and neonates (50% of gazelles in Structure A). Seasonality, feasting and special burial hypotheses are evaluated to reconstruct the history of these accumulations.
Medieval Human History of the Levant Written on Horseback

Hadas Motro

The Koret School of Veterinary Medicine, The Robert H. Smith Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Rehovot, Israel

The ability to cover large distances and transport merchandise made the horse one of the most important domestic animals in human history. Historical sources testify to the importance of equids in transportation, warfare, economy, and to their being symbols of status. The historical documents contain numerous descriptions of horses but the conclusions derived from them concerning horse breeds and size have never been tested experimentally due to lack of sufficient archaeological findings of equid assemblages. Our study describes for the first time the human history in the southern Levant based on over 1,500 equid remains studied from the medieval period representing several sites located in different geographical areas. The presence of horses, mules and donkeys in different frequencies among the various sites and the pathologies found on the specimens can be used to describe the human activities at each period and site. The knowledge of the distribution of the equine species can shed light on the directional diffusion of technological innovations and the awareness to the equid capabilities.
Smell of Neolithic Çatalhöyük (Turkey). Time and Space of Human Activity
Kamilla Pawlowska

Institute of Geology, Adam Mickiewicz University, Poznan, Poland

The research results from Çatalhöyük (Turkey) offer a possibility to consider the smell of a Neolithic settlement, reconstructed indirectly in the context of various human activities. Butchery, processing, consumption and use of animal products are discussed, as well as the disposal of food waste based on middens; the influence of architecture and spatial structure of the settlement on human activity are also considered.
The cultural history of the chicken in the Southern Levant: A view from the Hellenistic site of Maresha

Lee Perry-Gal, Guy Bar-Oz, Adi Erlich and Ayelet Gilboa

Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

The chicken (Gallus gallus) is today the most widespread domestic animal in the world. It was first domesticated in Southeast Asia as early as the second millennium BC, spread throughout Europe and the Levant during the first millennium BC and became well established in the old world by the late Roman period (2nd-4th centuries BCE). The exact time of its introduction to the southern Levant, which could have served as the gateway to Europe, is rather vague. Here we present the earliest contexts with significant amounts of chicken bones (NISP ~40%) from the Hellenistic site of Maresha (4th-2nd centuries BC), located in Israel’s Judean foothills. We used the rich zooarchaeological record of the region to track spatial and temporal changes of chicken distribution. While the appearance of chicken in the region is first evident in the Iron Age (1200-600 BCE), it is only in Late Hellenistic and Roman times that it becomes abundant in most sites. These data suggest that chicken were exploited in two different exploitation strategies. First, they were rare exotic species and exploited mainly for ritual activity. In the second phase, which is evident in Maresha, chicken were exploited as a major food source and most of their remains derive from domestic contexts. Surprisingly, Maresha is outstanding among other Hellenistic sites with its high numbers of chicken (the average frequency of chicken remains for Hellenistic period sites in the Levant is only 8%).
Crusader's Diet: Arsur (Apollonia-Arsuf) as a Case Study in War and Peace*

Miriam Pines, Lidar Sapir- Hen and Oren Tal

Department of Archaeology and Ancient Near Eastern Cultures, Tel Aviv University, Tel Aviv, Israel

A regional study of the Crusader's everyday and war diet in castles and townships along the coastline of Israel has yet to be conducted. In our study we examined a 13th century animal bone assemblage found in the Crusader site of Arsur (Apollonia-Arsuf), located on the northwestern outskirts of today's city of Herzliya. The bones were found in a cesspit in the castle of Arsur which, it is well documented, was protected by the Hospitaller knights during the Mamluk siege, led by Baybars in March-April 1265. The remains of meals from this 40 days siege are presented here.

Preliminary results show that the assemblage is dominated by livestock animals; sheep, goat, cattle and pig, as well as by chicken and other birds. Wild game remains are very scarce. Burning signs or evidence of butchery are very rare. Comparing to other assemblages prior to and during the Mamluk siege and with other Crusader's townships and castles along the Israeli coastline enables us to gain insight into Crusader's everyday and wartime diet. This diet is linked to their general well-being and way of living during the period which marks the end of the Crusader presence in the Holy Land.
The paper presents an analysis of faunal remains from the site of Tel Ro‘im West, dating to the Pre-Pottery Neolithic B, Pre-Pottery Neolithic C and Pottery Neolithic periods. The site is located north-west and above the Hula Valley, and was excavated in a salvage project by a team headed by Dani Nadel (The Zinman Institute of Archaeology, the University of Haifa). The importance of the site stems from its rare stratigraphic sequence that spans the ninth and eighth millennia BP, the time when farm animals were domesticated and incorporated in the economy of village communities in the southern Levant, each species with its specific rate and importance. The faunal remains from Tel Ro‘im West consist mainly of mammals, mostly ungulates; low frequencies of reptiles and birds were also detected. The Pre-Pottery Neolithic B assemblage was characterized as having a high frequency of sheep/goat as well as a wide variety of wild animals such as boars, aurochs, gazelles and fallow deer, and also small carnivores, turtles and birds; of special note is the appearance of domesticated sheep already at this stage. The Pre-Pottery Neolithic C period saw a sharp decline in the richness and evenness of species represented in the assemblage, an increase in the frequency of sheep/goat, especially sheep, and a rise in the frequency of cattle; this may be interpreted as a shift from a mixed hunters/herders economy to an agro-pastoral one. These trends continued in the Pottery Neolithic period. No evidence was found for a change in herd management that may be associated with secondary products such as wool or milk, so it seems that sheep and goats were still kept mainly for their meat. The relatively high frequency of boars in the assemblages and their small size may hint that they were under a certain cultural control already by the early stages of human occupation at the site in the Pre-Pottery Neolithic B. The boar remains from the Pottery Neolithic period show a significant decrease in the size of mature animals and a rise in the frequency of newborns that may testify to the domestication of these animals – earlier than hitherto thought in the southern Levant.
Reconstructing Prehistoric Identities: Molluscan Material from Western Asia and the Aegean*

Konstantina Saliari

Vienna Institute of Archaeological Science, University of Vienna, Vienna, Austria

The primary objective of this research project is the investigation of archaeo-malacological material in a broader context of the prehistoric cultural landscapes of Western Asia and the Aegean. Archaeomalacological research has been expanding worldwide and the field has advanced significantly. However, further application of interdisciplinary approaches is required for a comprehensive integrated synthesis.

This research focuses on Stone Age sites of Western Asia and more specifically on sites from the Paleolithic (el Tabun, Qafzeh), the Mesolithic (Neve David, Abu Salem, Rosh Horesha), and the Neolithic periods (Basta, Beidha, Ayn Abu Nukhayla). The variety and number of shells, the prevalence of specific species, their uses and symbolism shed light on similarities and differences related to the natural world and cultural identity. The comparative study between the two different geographical and cultural areas -prehistoric Aegean and western Asia- enables us to perceive differences and variations of the landscape of the cultural traditions and their interconnections.

The final synthesis leads to a palaeoenvironmental reconstruction of the natural and cultural landscape and to an archaeological interpretation of the life of prehistoric Stone Age communities.
Past studies have demonstrated absence of pig bones at Iron I sites in the highlands and their exceptional abundance at contemporaneous Philistine sites. As a result, past treatment of pork consumption assumed that the dichotomy between Israelites and Philistines prevailed throughout the Iron Age. Our work shows that the situation in both the Iron I and Iron II is more complex than has been suggested previously.

Creating a broad database using faunal reports from 35 sites in Israel, we examined the notion that pork consumption is a way to distinguish Israelites/Canaanites from Philistines. We first demonstrate that dichotomy in pig consumption did occur. This is recorded in Iron Age IIB, and between sites located in the kingdoms of Israel, which demonstrate growing pork consumption habits, and sites in Judah, which avoided eating pork. We also demonstrate that pigs do not appear (or appear in small number) in Iron Age I Canaanite centers in the lowlands as well as in non-urban settlements within the presumed territory of the Philistine city-states.

We suggest that pork avoidance fits the reality in Judah in the Iron IIB-C, but does not reflect daily life in the Northern Kingdom of Israel. It seems that in the 8th-7th centuries BCE, when pig frequencies in Philistia already diminished considerably, promotion of pig avoidance could have been directed toward Israelites who moved to Judah after the collapse of the Northern Kingdom in 720 BCE. The pig taboo could have been another Judahite cultural trait that was opposed to the situation in the north at the time of the biblical authors.
To Be or Not to Be a Levantine Aurignacian - Aves Exploitation at Hayonim Cave (Layer D)

Tal Simmons¹, Anna Belfer-Cohen², Ofer Bar-Yosef³ and Rivka Rabinovich⁴

¹ Tal Simmons, DABFA School of Forensic and Investigative Science, University of Central Lancashire, UK
² Institute of Archaeology, The Hebrew University of Jerusalem, Jerusalem, Israel
³ Department of Anthropology, Harvard University, Cambridge MA, USA
⁴ National Natural History Collections, Institute of Earth Sciences, Institute of Archaeology, The Hebrew University of Jerusalem, Jerusalem, Israel

A condense spot of activity was found at Hayonim Cave Layer D, assigned to the Levantine Aurignacian (ca. 29,000 BP). It provides evidence of spatial patterning portraying a variety of activities related to butchery, filleting, extracting marrow (i.e., a “kitchen midden”), as well as knapping flint and making bone tools. The faunal components include mainly gazelle with fewer fallow deer and numerous birds.

The state of preservation of the birds at the site is excellent, evinced by the presence of very fragile body parts and well preserved bone surfaces. The similarity in the state of preservation between the mammalian and the avian fauna at the site suggests a similar history of deposition.

More than 800 bird bones were identified, representing 55 species of 19 families, including of birds of prey and water birds, large and small birds, and birds from various ecological niches. Signs of modification such as cut marks, slice marks, striations and fractures were observed on over 14% of the bones. Most of the birds are not cave dwellers and rarely if ever visit caves during their life cycle. Active human observation and assessment of birds, as well as intensive exploitation are suggested. We will explore the paleoecological implications of such a rich assemblage and the behavioral inference resulting from avian exploitation. More than one scenario is proposed, from food to personal adornment and potentially ritual activity as well. We will examine other contemporaneous assemblages and what is implied about the cultural imprint of the Levantine Aurignacian.
Geometric Morphometric Analysis of Camels’ Basipodium Bones

3D Applications for Identifying Species

Ali Sirwan

1Department of Early Prehistory and Quaternary Ecology, Institute of Pre- and Protohistory of the University of Tübingen, Tübingen, Germany

There are two living species of camels; the two-humped camel *Camelus bacterianus* with its wild ancestor *C. ferus* and the one-humped camel *C. dromedarius*. These two species can also hybridize and produce *F1* hybrid camels which are sometimes found at archeological sites. This study, which is part of a Master’s thesis, tries to estimate groups and identify species using geometric morphometric analysis based on landmarks taken from basipodium bones of camels. Using a Microscribe landmarks were made of the bones of *C. bacterianus, C. dromedarius*, and *F1* hybrid camels from the archaeozoological reference collection of Tübingen University and Munich University. The preliminary results of multivariate analyses of the material seem promising. The examination will therefore be extended by including more skeletons to obtain more stable results, in the hope of establishing a reference for identifying camel bones from archaeological sites, and grouping the specimens into the correct taxon. As 3D applications for osteology become more applicable for taxonomic identification of cranial and even postcranial material, this study supports the future use of these new techniques.
Faunal Remains from Chogha Golan, a PPN Site in the Zagros Foothills of Western Iran

Britt M. Starkovich\textsuperscript{1,2}, Mohsen Zeidi\textsuperscript{2,3}, Simone Riehl\textsuperscript{1,2} and Nicholas Conard\textsuperscript{2,3}

\textsuperscript{1}Institute for Archaeological Sciences, University of Tübingen, Tübingen, Germany
\textsuperscript{2}Senckenberg Center for Human Evolution and Paleooecology at Tübingen, Tübingen, Germany
\textsuperscript{3}Department of Early Prehistory and Quaternary Ecology, University of Tübingen, Tübingen, Germany

The aceramic Neolithic site of Chogha Golan was excavated in 2009 and 2010 by the Tübingen-Iranian Stone Age Research Project. The site, located in the Zagros foothills in western Iran, includes eleven archaeological horizons that span from 11,700 to 9,600 cal BP. The range of occupation of the site is significant, as it encompasses the beginnings of both plant and animal domestication. Abundant artifacts recovered through the sequence include lithics, groundstone, clay figurines, and ornaments, as well as ample floral and faunal remains. Excavators recorded multiple plaster floors and architectural building phases. A striking feature of Chogha Golan is the quantity of macrobotanical remains, which allows for a high-resolution analysis of on-site development from pre-domestication cultivation of a number of wild taxa to eventual cultivation of domesticated emmer wheat. This paper discusses the Chogha Golan faunal remains in the context of changes in plant use. Inhabitants exploited a range of animals at the site, including gazelles, sheep, goats, wild pigs, equids, cattle, partridge, tortoise, and fish. A major question is whether shifts in the faunal record track those observed in the botanic remains, and if such changes were driven by environmental, demographic, or cultural forces. The time span represented at the site, and fine-scale excavation and recovery techniques employed in the field, gives the Chogha Golan faunal remains the potential to significantly augment our understanding of the Neolithic transition in this region.
Characterizing Gazelle Exploitation at Peasant Societies: The PPNB Tell Halula Case

Carlos Tornero\textsuperscript{1,2}, Miquel Molist\textsuperscript{2} and Maria Saña\textsuperscript{2,3}

\textsuperscript{1} Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnements, UMR 7209 CNRS/MNHN, Paris, France
\textsuperscript{2} Seminari d’Arqueologia del Pròxim Orient (SAPPO), Prehistory Departament. Prehistòria. Edifici – C. Campus Universitari. Universitat Autònoma de Barcelona. 08169. Bellaterra, Barcelona, Spain
\textsuperscript{3} Laboratori d’Arqueozologia. Prehistory Departament. Universitat Autònoma de Barcelona, Spain

Gazelle is one of the most exploited wild mammal species in the Near East during the transition from hunter-gather to peasant societies. Its exploitation declines during the consolidation of agriculture and herding activities, but high frequencies of representation are not rare in some late Neolithic contexts. In this work the exploitation of \textit{Gazella subgutturosa sp.} is evaluated from Tell Halula site (Middle Euphrates Valley, Arab Republic of Syria) where frequencies of representation are high during some stages of the PPNB sequence between 7800 – 7500 cal BC. Different archaeozoological approaches have been implemented to characterize these assemblages. Frequencies of representation of other wild species and domestic resources at the site are considered carefully. Frequencies of body parts and skeletal elements are evaluated to examine how gazelles were transported to the site once killed. Reconstruction of demographic profiles (reliable mortality profiles and sex-ratio distribution) helps us to understand if a selection of some specific individuals existed. Data is evaluated in the framework of the published archaeozoological data from the Upper and Middle Euphrates Valley during the sequence 12ka cal BC to 7000 cal BC but also of ethological data available for Persian/Sand gazelle. Final results extend the discussion on topics such as the seasonal migratory pattern of this animal resource, its seasonal or year round exploitation and the possibilities of reconciling its exploitation with the labours from agriculture and herding activities.
Adoption, Increase and Consolidation of Sheep Production at Tell Halula Site (Middle Euphrates Valley, Arab Republic of Syria) during Middle to Late PPNB Occupations: An Integrated Approach Using Osteological and Stable Isotopes Analyses

Carlos Tornero\textsuperscript{1,2}, Marie Bălăsse\textsuperscript{1}, Miquel Molist\textsuperscript{2} and Maria Saña\textsuperscript{2,3}

\textsuperscript{1} Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnements, UMR 7209 CNRS, Paris, France
\textsuperscript{3} Laboratori d’Arquezoologia. Prehistory Departament. Prehistòria. Edifici – C. Campus Universitari. Universitat Autònoma de Barcelona. 08169. Bellaterra, Barcelona, Spain

Sheep is one of the first species domesticated in history, a process noticed for the first time in Near East at the Upper and Middle Euphrates Valley ~8500 cal BC during the Early Pre Pottery Neolithic - B (Peters et al., 2005). The importance of this species for subsistence strategies during this time period is highlighted by its increased and over representation during the Middle PPNB and Late PPNB in the Northern Levant (Peters et al., 1999). Tell Halula site (Middle Euphrates Valley, Arab Republic of Syria) is a well-documented case study of this process. After its adoption at the settlement under artificial breeding conditions (~7500 cal BC), sheep became one of the main animal resources exploited. This occurred within a short time (~7000 cal BC) when sheep production was diversified, from meat to animal fibres (Saña, 1997; Tornero, 2011; Saña & Tornero, 2013).

This study evaluates how sheep husbandry increased and establishes this exploitation pattern by integrating osteological and biogeochemical analyses. Size, herd structure and production traits are evaluated and demographic profiles are reconstructed from reliable mortality profiles and sex-ratio distributions. Slaughtering patterns reveal an interest in keeping animals at mature and reproductive age during the first stages of the process and a selection for increased numbers of females over males. Sheep production is also evaluated by sequential stable isotope analyses of tooth enamel bioapatite in sheep specimens. Season and seasonality of birth are evaluated from carbonate $\delta^{18}O$ values and variations on sequences are compared with other archaeological and modern sheep populations where information from reproduction patterns is known. Seasonal diet during the growth and fattening phase is evaluated by $\delta^{13}C$ values and variations along sequences. Data is finally interpreted within the framework of ethnographical and ethological studies from the study area. Results show that production of sheep must be very limited by some of the environmental and natural factors constraining this species. This adds important information to our knowledge of the technical development of herding strategies along history, the inherent constraints of sheep for reproduction and breeding and the possibilities of its exploitation by the first agropastoral societies in Near East.
Shark Teeth Accumulation in the Early Neolithic Site Ajakagytma (Kel’teminar, Uzbekistan): An Original Use of Fossils for Making Tools?

Jean-Denis Vigne¹, Brunet Frédérique², Debue Karyne¹, Rozen Mathilde³ and Khudzhanazarov Muhiddin⁴

¹ CNRS, Muséum national d’Histoire naturelle, Archaeozoology-Archaeobotany (UMR7209), Paris, France
² CNRS, Archéologies et Sciences de l’Antiquité (ArScAn, UMR 7041), Nanterre, France
³ University of Paris I Panthéon-Sorbonne, Paris, France
⁴ Institute of Archaeology, Uzbek Academy of Sciences, Samarkand, Uzbekistan

Ajakagytma is a Neolithic lake shore site located in the central desert of Uzbekistan (Kyzyl-Kum). 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 an enigmatic set of nearly 600 shark teeth, 80% of them being concentrated in less than 6 sq. meters. Most of them were of small size (crown height comprised from 4.5 to 20mm). Taxonomic identification evidenced the presence of an association of six to seven extinct shark species, all of them being known from the Paratethys Sea during the Middle Ypresian (Early Eocene). Test excavations and intensive surveys around the site evidenced that it was settled not only near one of the rare flint sources of the area, but also right on a vast Early Eocene marl outcrop with rather abundant shark teeth. The analyses of the frequencies of the species and sizes of the teeth accumulated in the archaeological site suggest that the kel’teminar intensively collected shark teeth around the site, including very small teeth but with a clear preference for those of the largest species. More than 10% of the teeth accumulated in the archaeological site were chipped, notched or polished, most of these modifications being artefactual. This unique massive use of shark teeth will be discussed with reference to the microlithic characteristic of the Kel’teminar culture.
Ancient Urban Ecology in the Near East Reconstructed from Microvertebrate Remains
Lior Weissbrod¹, Guy Bar-Oz¹ and Israel Finkelstein²

¹ Laboratory of Archaeozoology, Zinman Institute of Archaeology, University of Haifa, Haifa, Israel
² The Jacob M. Alkow Department of Archaeology and Ancient Near Eastern Civilizations, Tel Aviv University, Tel Aviv, Israel

The potential of microvertebrate remains for reconstructing the paleoecology of urban sites in the Near East has long been unexplored. During the past decade, relatively large-scale and systematic retrieval of fine-sieved samples from sites belonging mainly to the Late Bronze and Iron Age periods in Israel (2nd-1st millennia BC) has been initiated. We apply taphonomic and ecological approaches to analyzing microvertebrate remains (mainly small mammals) resulting from this effort. The material represents 12 different sites, all located within the Mediterranean climate zone and spread across different geographic regions including the coast, inland valleys and the hilly and mountainous areas. The samples were collected mainly from urban settlements with histories of long, continuous and dense occupation but also from a number of rural sites where occupation was periodic and less intense.

Using taxonomic and taphonomic characteristics we identify three groups of taxa with associated indicator species: 1) urban fauna dominant at urban sites (house mouse, *Mus musculus domesticus*), 2) abandonment fauna restricted mainly to rural sites (spiny mouse, *Acomys cahirinus*) and 3) burrowing fauna which is rare and represents intrusive elements unrelated to the period of site occupation (mole rat, *Spalax ehrenbergi*). The urban community of small fauna is highly impoverished consisting of >80% of house mice and a single additional taxon – shrews (*Crocidura* sp.), which occurs in relatively low frequencies. This suggests an ecologically isolated structure of early urban sites and differs markedly from what we see in modern cities where rapidly expanding low-density suburban areas contribute to increasing biodiversity levels within urban areas. The study provides a glimpse into the early development of an urban ecology in antiquity and offers a much-needed long-term perspective on current concerns regarding the role of cities in the conservation of biodiversity on a global scale.
Late Paleolithic Subsistence and Ecology in the Kom Ombo Plain, Upper Egypt

Reuven Yeshurun

Program in Human Ecology and Archaeobiology, National Museum of Natural History, Smithsonian Institution, Washington DC, USA

Data on Terminal Pleistocene subsistence trends and human paleoenvironment constitute the necessary background for studying the punctuated emergence of sedentism and food production in the Near East. While the Levant and Zagros regions figured prominently in discussions of the Broad Spectrum Revolution and the domestication of animals, the archaeological record of the Nile Valley has rarely been integrated into the picture. Salvage excavations and surveys in the Kom Ombo Plain (Nile Valley, ca. 40 km north of Aswan), conducted in the 1960’s by a Yale University expedition led by Charles Reed, produced several important faunal assemblages associated with Late Paleolithic (ca. 22.5-14.5 years BP) sites with diverse lithic industries. Thus far, these assemblages had been studied only from a paleontological perspective. This paper presents a comprehensive taphonomic-zooarchaeological analysis of the Kom Ombo faunas collected by Reed, with the aim of characterizing the Terminal Pleistocene economy and ecology in the Nile Valley, and contributing to the study of the major developments in forager life-ways across the Near East.
Humans and Carnivores in the Upper Paleolithic of Manot Cave, Upper Galilee, Israel: Preliminary Zooarchaeological Results*

Reuven Yeshurun¹,², Nehora Schneller-Pels¹, Lior Weissbrod¹, Guy Bar-Oz¹, Omry Barzilai³, Israel Hershkovitz⁴ and Ofer Marder⁵

¹ Laboratory of Archaeozoology, Zinman Institute of Archaeology, University of Haifa, Haifa, Israel
² Program in Human Ecology and Archaeobiology, National Museum of Natural History, Smithsonian Institution, Washington DC, USA
³ Israel Antiquities Authority, Jerusalem, Israel
⁴ Department of Anatomy and Anthropology, Sackler Faculty of Medicine, Tel Aviv University, Tel-Aviv, Israel
⁵ Archaeology Division, Ben-Gurion University of the Negev, Beer Sheva, Israel

The discovery of well-preserved faunal remains in association with abundant cultural materials, dated to the Upper Paleolithic (UP) Period (ca. 50/47-22 ka), in Manot Cave may significantly increase the state of knowledge on subsistence and paleoenvironments during this important period in the Levant. Manot is a large and sealed karstic cave in the Western Galilee region of Israel. The cave was discovered in 2008 and has been subjected to systematic excavations since 2010. Six excavation areas were opened (Areas A-F), displaying a long UP sequence, as well sporadic Middle Paleolithic and Epipaleolithic finds. Preliminary analysis of the faunal remains in Area C reveals that they represent butchery and consumption activities of UP hunters (>30 ka). Mountain gazelle (Gazella gazella), fallow deer (Dama mesopotamica) and occasionally other ungulates (roe deer [Capreolus capreolus] and red deer [Cervus elaphus]) and small game species (spur-thighed tortoise [Testudo graeca], Cape hare [Lepus capensis], red fox (Vulpes vulpes) and chukar partridge [Alectoris chukar]) were brought to Manot Cave, butchered and consumed. In contrast, observations on the faunal remains in the upper sediments of Area D and several findspots near the cave walls indicate the presence of other species such as spotted hyena (Crocuta crocuta), aurochs (Bos primigenius), and yet-undetermined equid and caprid. The larger ungulates (particularly Dama/Cervus) outnumber gazelles in these samples, and many specimens display conspicuous signs of ravaging by large carnivores. Thus, at least two accumulation processes took place at Manot Cave during the Upper Paleolithic, the deposition of human food refuse in Area C and leftovers of carnivore (Hyena?) kills in other parts of the cave. The function of the site, possible competition with large carnivores for food and shelter, and human ecology at Manot will be of prime interest as research continues.
We Are What We Eat: The Role of Carps (Cyprinidae) in Early Acheulian Diet

Irit Zohar\textsuperscript{1,2} and Naama Goren-Inbar\textsuperscript{1}

\textsuperscript{1}Institute of Archaeology, The Hebrew University, Mount Scopus, Jerusalem, Israel
\textsuperscript{2}The Leon Recanati Institute for Maritime Studies, University of Haifa, Haifa, Israel

The carp (Cyprinidae) was the first fish to be domesticated, the first to be raised in ponds, and the first to be bred for color and kept in ponds for decorative purposes. Studies show that these unique processes resulted from the exploitation of annual aquatic plants (e.g., rice, water chestnuts) that grow in relatively shallow ponds with low oxygen levels. While most species of fish cannot survive in such extreme conditions, carps flourish in them and were seasonally exploited following the cropping of the aquatic plants. In this paper we study the roots of this exceptional interaction between early cultures, wetland habitats and carp exploitation. Our study is based on analysis of tens of thousands of fish remains recovered from the Acheulian site of Gesher Benot Ya’aqov (GBY), Israel (ca. 0.8 Ma). In order to study the possible role of carps in the early Acheulian diet, we examined the taxonomic composition of fish remains recovered from the entire depositional sequence of the site and compared it with several sources of data: 1) Early (1950s) fishing reports from the Lake Hula fishery; 2) A taphonomic study of naturally accumulated fish along the shores of paleo-Lake Hula; 3) An experiment to assess the effect of cooking and burning on the survivorship of carp remains. Preliminary results of our study indicate the following. 1) While Cichlidae (Tilapia, St. Peter fish) were very abundant in the Lake Hula fishery, at GBY there is a significant preponderance of large carps (mainly Barbus sp. and Carasobarbus canis; Cyprinidae). 2) Archaeological horizons with naturally accumulated fish remains that represent the paleo-Lake Hula fish community were identified (Area A). These horizons differ significantly in terms of fish remains from other GBY archaeological horizons (Area B) in species richness, diversity and skeletal element representation. 3) Our cooking and burning experiment demonstrates that in cyprinids, survivorship of pharyngeal teeth is higher than that of other skeletal elements.

Overall, our study shows that the diverse aquatic wetland of paleo-Lake Hula was extensively exploited by the Acheulian occupants of GBY. The preponderance of carps in a habitat that was relatively shallow, rich in aquatic plants and low in dissolved oxygen provides the earliest known evidence for the interaction between aquatic plants and seasonal carp exploitation. A similar scenario led, hundreds of thousands of years later, to the unique process of carp cultivation and domestication.
The Role of Preserved Fish: Evidence of Fish Processing and Long-Term Preservation during the Late Bronze Age (14th Century BCE)*

Irit Zohar1,2,3, Anuar Zidane4 and Michal Artzy2,3

1 Institute of Archaeology, The Hebrew University of Jerusalem, Jerusalem, Israel
2 The Leon Recanati Institute for Maritime Studies, University of Haifa, Haifa, Israel
3 The Department of Maritime Civilizations University of Haifa, Haifa, Israel
4 Zinman Institute of Archaeology, University of Haifa, Haifa, Israel

Sun and wind drying is regarded to be one of the earliest methods used for food preservation and storage. The earliest descriptions of fish preservation were recovered in Egyptian tomb reliefs from the old kingdom, dated to ca. 2649–2150 BCE. These reliefs showed fish butchered by various methods prior to their preservation. Unfortunately, the zooarchaeological data failed to provide apparent evidence for the practice of these butchering methods. As a result, fish processing methods were reconstructed mainly from anomalies in skeletal element presentation and from the presence of exotic fish.

In this paper we present exclusive evidence that proves, for the first time, that fish were processed following the exact method described in the Egyptian reliefs.

Our study is based on a small sample of handpicked and well-preserved fish remains (NISP=250) recovered from the Late Bronze Age (14th -13th Century BCE) coastal site of Tell Abu Hawam (TAH), Israel.

Among the fish remains we identified are: Chondrichthyes (sharks and rays), seven families of Eastern Mediterranean bony fish, and Nilotic fish (Lates niloticus). Strikingly, the breakage patterns observed on the dentary, cleithrum, premaxilla and maxilla, were identical in their location and angle to that observed on butchered fish from Panama and Sinai (Egypt). In addition to the surprising similarities, the recovery of a nearly complete skull of a Dusky grouper (Epinephelus marginatus; Lowe, 1834), with a lateral breakage, verifies for the first time, that fish were dried precisely by the same butchering method described in the Ancient Egyptian tomb reliefs. The recovery of a wide diversity of local Mediterranean fish processed for long-term preservation at TAH, accentuates their economic and dietary role at a site that played a role as a gateway anchorage during the 2nd millennium BCE.