



Zooarchaeology BEYOND FOOD

2nd Faunal Interest Group Symposium

University of Toronto

Online

March 19th to 20th, 2021



Keynote: T. Max Friesen, University of Toronto

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Land Acknowledgement

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

The Land Acknowledgement is a formal statement recognizing the unique and enduring relationship that exists between Indigenous Peoples and their traditional territories. This statement was developed in consultation with First Nations House and its Elders Circle, some scholars in the field, and senior University officials. The statement is applicable to all three campuses—UTM, UTSC, and St. George—as well as the Koffler Scientific Reserve at Jokers Hill, the Institute for Aerospace Studies (UTIAS), and is available to all members of the University community for use at University events as appropriate.

For more information about Land Acknowledgements, visit the Indigenous Initiatives U of T “Land Acknowledgement” page, <https://indigenous.utoronto.ca/about/land-acknowledgement/>, or the University of Guelph video resource “Land Acknowledgements and Why They Matter,” <https://vimeo.com/517181293>.

Welcome, Overview, and Howard G. Savage

Welcome to the second **Faunal Interest Group (FIG)** zooarchaeology symposium, hosted online by the Archaeology Centre and the Department of Anthropology at the University of Toronto, **March 19th and 20th, 2021**. The theme this year is **Zooarchaeology BEYOND FOOD**, meaning all the interactions between humans and other animals which are not just about eating, such as relationships, rituals, raw material, and more. We are also celebrating **50 years** of zooarchaeology at the **Howard G. Savage Faunal Archaeo-Osteology Laboratory** at University of Toronto, and this symposium pays tribute to the founder of the program, Dr. Howard G. Savage, with a *Stories about Howard* social.



Dr. Howard Gordon Savage (December 28, 1913–March 16, 1998) received his MD from the University of Toronto in 1937 and worked as a pediatrician from 1938 to 1969. He served in the Second World War as a Medical Officer with the Royal Canadian Air Force, from 1942 to 1945. For most of the 1960s, Dr. Savage worked with Jim Baillie, of the Department of Ornithology at the Royal Ontario Museum, helping to expand the collection of ornithological specimens. The work at the ROM led to his interest in osteo-zooarchaeology, and in 1969, Dr. Savage was hired as a Research Associate by the Department of Anthropology at University of Toronto. Thus began the creation of one of the largest and most diverse zooarchaeology collections in Canada, with a wide range of North American and exotic specimens, including *Panthera leo*, *Panthera tigris*, and several *Ursus*. The following year, Dr. Savage started teaching zooarchaeology, and in 1973, he taught the first of many ANT415: Faunal Archaeo-Osteology classes. Through Howard's dedication and commitment, and many years of students preparing their own specimens, the collection grew quickly. In 1979, the University designated the comparative collection as the Howard G. Savage Faunal Archaeo-Osteology Laboratory.

Many students passed through the faunal lab in the old South Borden Building, and several ultimately pursued careers in zooarchaeology. Many of these scholars continue to shape zooarchaeology today, with dozens of their students contributing to the discipline all over the world. Dr. Savage brought a deep love of learning about animals to the class and inspired many with his knowledge and good humour. He was also a festive individual, who enjoyed throwing Thanksgiving and Halloween celebrations in

the lab, with a roasted turkey processioned in with bagpipes. He remained in the lab until his retirement, in 1997, and today, Dr. Max Friesen (a student of Howard's) continues ANT415 in a new space, but with the same collection and many of the same teachings.

From this strong tradition of zooarchaeological research, scholarship, and training, the Faunal Interest Group was created in 2007 as a graduate-student initiative to provide a productive forum for discussion around research in zooarchaeology. We discuss new and old issues of zooarchaeological method and theory, host guest lecturers, and provide a casual and supportive arena for our group members to present and receive input on their own research. In 2017, we hosted our first FIG symposium, entitled Landscape Interaction and Zooarchaeology, and we subsequently published many of the conference papers in a 2019–2020 *Journal of Archaeological Science: Reports* Special Issue with the same title, <https://www.sciencedirect.com/journal/journal-of-archaeological-science-reports/special-issue/10TT1MRXSK7>, guest-edited by Adam Allentuck, Suzanne Needs-Howarth, Aleksa K. Alaica, Danielle Desmarais, and Stephen Rhodes.

We are fortunate to have even greater interest for this symposium; so much so that an extra day was added to accommodate the many submissions. If you're a zooarchaeologist, you know there is so much more to zooarchaeology than saying "What's for dinner?" and we wanted to provide a gathering where colleagues can share their research into the diverse range of human–non-human relationships that have been inferred from the past. The 26 papers have been loosely sorted into 7 sessions: Feasting and Aesthetics; Adaptations and Species Introductions; Shaping Bone and Forming Legacies; Animal Life Histories; Emerging Technologies; Beyond Food in the Wild; and Gender, Ritual, and Symbolism. On the first day we will have three sessions, followed by a talk from our keynote speaker, Dr. Max Friesen, who will also start off our socializing session, *Stories about Howard*. On the second day we will have the remaining four sessions, and Dr. Genevieve Dewar will moderate the final discussion and provide closing comments.

Additionally, FIG is putting together an *Academic Phylogeny of Howard G. Savage*, and we welcome colleagues to add names and information to our database during lunch break via Zoom, or by visiting <https://drive.google.com/file/d/1sQtdwXTqe1RJdzbHixjIAeGpnOrpFVuz/view?usp=sharing>. This academic family tree will serve to better understand the impact of the Howard Savage legacy on wider zooarchaeological practice.

We welcome anyone interested in non-human animal research and understandings to attend any and all of the presentations and discussions over the two days, participate in the *Stories about Howard* social ... and **Have a Great Bone Day!**

Conference Procedures

This symposium will take place completely online using the platform of Zoom. Please click on the link you received after registering and follow the on-screen instructions. All presenters and attendees are free to join the meeting at any time. Presenters should arrive in advance of the start of their session and remain for its duration to ensure that any questions posed can be addressed in the discussion period. This symposium is **not recorded**, and it is **not permitted to record any session** as the appropriate permissions have not been obtained.

We ask that you identify yourself with a full name to ensure that you are properly admitted to the webinar and break-out room sessions. We also ask that you set your profile picture to something related to zooarchaeology, archaeology, or animals, thus making it easier for us to recognize the difference between those intending on joining the meeting and interlopers.

We ask that all audience members have their microphones on mute and deactivate their cameras during the presentations to save on bandwidth. However, participants are free to turn on their camera for questions after the presentation, and participants will be able to unmute to ask questions once they have been called upon after raising their “digital hand.”

There are seven sessions, and each session is chaired by a moderator. All communication can be directed to this person by all presenters and attendees. In each session, presentations will be 12–15 minutes in length. If time is available, participants can pose questions posed at the end of the paper; if not, they can pose them in the discussion period for the session. We ask that all questions and discussions be approached in a constructive but supportive manner.

During the lunchbreaks we invite participants to share any names or information that can be added to the Howard G. Savage academic phylogeny tree. The Zoom platform will move to a general meeting to allow for break-out rooms and to easily collect information. The lunchbreak Zoom link will be sent to registrants on Thursday, March 18th. We ask you to log in with your cameras off and microphones muted unless you would like to engage in dialogue with others.

NOTE: All interactions are to be collegial. Any misconduct will result in any attendee being ejected from the meeting.

Important notice regarding times, time zones, and daylight savings time

Our schedule was developed by considering as many possible time zones as we could, to accommodate as many researchers as possible. Please note that daylight savings time will be in effect in Canada (except Saskatchewan, Yukon, and parts of Quebec, B.C., and Ontario) and the United States during the symposium, but it will not be in effect for any other country in the northern hemisphere; it varies in the Southern Hemisphere.

All times listed in this programmed reference Eastern Standard Time (EST). **Doors will open at 10:30 am EST** each day of the symposium. Please check your time zone in relation to EST to ensure you arrive on time (<https://www.thetimezoneconverter.com/>).

Contributors

Organizing Committee

Aleksa K. Alaica
Danii Desmarais
Dr. Radovan Kabatiar
Louis-Vincent Laperrière-Désorcy
Dr. Suzanne Needs-Howarth
Dr. Trevor Orchard
Dr. Katherine Patton
Stephen Rhodes
John Vandergugten
Fan Zhang

Moderators

Aleksa K. Alaica
Danii Desmarais
Dr. Genevieve Dewar
Courtney Hopper
Dr. Trevor Orchard
Stephen Rhodes
John Vandergugten

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Archaeology Centre, University of Toronto
Department of Anthropology, University of Toronto

Symposium Schedule

Friday, March 19		
Time EST	Authors	Paper Title
11:10 AM	Organizing Committee	Introduction and Land Acknowledgement (Danii Desmarais)
Session 1: Feasting and Aesthetics Moderator: Danii Desmarais		
11:30 AM	Abu B. Siddiq	Fear, Feast, Cult, and Taboo: Aurochs in Neolithic Anatolia
11:45 AM	Freydis Ehrlich, Giedrė Piličiauskienė, Miglė Urbonaitė-Ubė, Eve Rannamäe	Multiple Ways to Use Eagles: A Case Study from the Castle of the Teutonic Order in Klaipėda, Lithuania (thirteenth–fourteenth century CE)
12:00 PM	Selena Vitezović	Animal Beauty: Use of Skeletal Elements for Decorative Purposes in the Neolithic in Southeastern Europe
12:15 PM	Discussion/Break	
Session 2: Adaptations and Species Introductions Moderator: Courtney Hopper		
12:30 PM	Nayeli Jimenez Cano	Coastal Exploitation in the Northern Maya Lowlands: Zooarchaeology and Current Marine Concerns
12:45 PM	Safoora Kamjan, Donna de Groene, Youri van den Hurk, Petar Zidarov, Nedko Elenski, William P. Patterson, Canan Çakırlar	The Emergence and Evolution of Neolithic Cattle Farming in Southeastern Europe: New Zooarchaeological and Stable Isotope Data from Džuljunica-Smārdeš, Northeastern Bulgaria (ca. 6200–5500 cal BCE)
1:00 PM	Sophie Rabinow	An Investigation of Agouti (<i>Dasyprocta</i>) Introduction to the Precontact Lesser Antilles
1:15 PM	Radovan Kabatiar	Toothless Sheep and Scrawny Cows: An Examination of Potential Links between Skeletal Pathologies and Environment Deterioration in South-eastern Turkey
1:30 PM	Discussion/Break	
Lunch/Break/Family Tree		
Session 3: Shaping Bone and Forming Legacies Moderator: Trevor Orchard		
3:00 PM	Erika Ebel and Genevieve LeMoine	Using ZooMS to Identify Sources of Osseous Raw Material at Iita, Northwestern Greenland
3:15 PM	Stephen Rhodes	Exploring Variability in Neolithic Bone Awls from Georgia, Southern Caucasus
3:30 PM	Trevor J. Orchard, Suzanne Needs-Howarth, Alicia Hawkins	Mining Howard Savage's Legacy: Assessing Zooarchaeological Data Quality in Undergraduate Student Faunal Reports
3:45 PM	Discussion/Break	
Keynote: Max Friesen Moderator: Danii Desmarais		
4:00 PM	T. Max Friesen	Glimpses of the Non-Economic in Arctic Zooarchaeology
5:00ish	Multiple	Stories about Howard

Saturday, March 20

Time EST	Authors	Paper Title
10:45 AM	Organizing Committee	Land Acknowledgement (Aleksa Alaica)
Session 4: Animal Life Histories Moderator: Aleksa Alaica		
11:00 AM	Ningning Dong	Animal Classification in Ancient China from the Late Neolithic to the Early Bronze Age
11:15 AM	Nemanja Marković, Jelena Bulatović, Velibor Katić, Miroslav Marić	Zooarchaeology Beyond Food: Osteobiographies of Early Medieval Dog and Pig Skeletons at the Divičmeđ site (Serbia)
11:30 AM	Helene Benkert, Carly Ameen, Alan Outram, Oliver Creighton	The Zooarchaeology of the Medieval Warhorse
11:45 AM	Katherine S. Kanne	Sizing Up Selection: Exploring the Evidence for Horse Types in the Hungarian Bronze Age
12:00 PM	Discussion/Break	
Session 5: Emerging Technologies Moderator: Stephen Rhodes		
12:15 PM	Johanna Sigl and Peter Kopp	When Leftovers Become a Tool
12:30 PM	Greenfield et al.	Narrowing the Gap: The Origins of Bronze Metallurgy for Daily Life Activities in the Southern Levant, with Zooarchaeological Data from Tall Zira'a
12:45 PM	Patrick Keenan	Come One, Come Awl: An Analysis of Tempering Methods of Bone Awls in Neolithic Europe and Western Asia
1:00 PM	Shelby Patrick	The Making of an Antler Harpoon Head: Iron vs. Slate and Implications for Production
1:15 PM	Discussion/Break	
Lunch/Break/Family Tree		
Session 6: Beyond Food in the Wild Moderator: John Vandergugten		
2:30 PM	Edward Shepherd	Exploring Human–Fox Relationships During the Early Neolithic in Yorkshire, England
2:45 PM	Stephanie Dolenz, Karis Baker, Naomi Sykes, Holly Miller	Dama Mia: Investigating the Origins and Game Activity of European Fallow Deer in Sicily and Sardinia
3:00 PM	Simon-Pierre Gilson and Andrea Lessa	Sharks and Precolonial Brazilian Coastal Groups: Let's Start to Think about Sociocultural Implications
3:15 PM	Aubrey Farrell	You're Gonna Need a Bigger Boat: An Analysis of Shark Tooth Artifacts from Precontact Florida
3:30 PM	Discussion/Break	
Session 7: Gender, Ritual, and Symbolism Moderator: Genevieve Dewar		
3:45 PM	Aleksa K. Alaica	Hunting, Herding, and Ritual: Dogs in Moche Daily and Ceremonial Practices of Northern Peru (200–950 CE)
4:00 PM	Norbert Stanchly and Kitty Emery	Testing the Theory of Animal Left–Right Symbolism in Ancient Maya Ritual Practice
4:15 PM	Zoe Helleiner	What Forces Shape Dorset Bone Needle Production in the Arctic?
4:30 PM	Discussion/Closing Comments	

Presenters and Paper Abstracts

Hunting, Herding, and Ritual: Dogs in Moche Daily and Ceremonial Practices of Northern Peru (200–950 CE)

Aleksa K. Alaica, Department of Anthropology, University of Toronto, Canada, aleksa.alaica@mail.utoronto.ca

Daily and ceremonial importance of dogs in the Andes region has been undertheorized in favour of considering other species to answer zooarchaeological questions around subsistence strategies and culinary traditions. Iconographic, ethnographic, and archaeological evidence attests to the integral role of dogs in ritual hunting activities, but also as essential pastoral companions. This presentation employs the canine surrogacy approach (Guiry 2012) to explore the use of dogs among Moche communities on the northern coast of Peru during the Early Intermediate Period and the Middle Horizon (200–950 CE). Zooarchaeological and isotopic analyses of dog remains reveal that they were incorporated into daily herding activities for coastal pastoral communities. The discovery of dogs as accompanying burials alongside human offerings at the site of Huaca Colorada, in the Jequetepeque Valley, reveals that they may have been understood as different types of non-human persons. The use of dogs as subsistence resources is possible, as there is some butchery evidence in zooarchaeological assemblages. However, dogs were also valued as emblems of political prestige; they were part of essential herding activities and key ritual internments during architectural renovations. By considering dogs as important non-human persons in Moche cultural practices, we can begin to interpret dogs beyond reductive, exploitable objects; instead, dogs as companions, as extended kin, and as non-human agents, are possible ways to value this species as more than just another food source.

Guiry, Eric 2012 A Canine Surrogacy Approach to Human Paleodietary Bone Chemistry: Past Development and Future Directions. *Archaeological and Anthropological Sciences* 5:275–286.

Bio: Aleksa K. Alaica is a PhD candidate in the Department of Anthropology at the University of Toronto. She examines the role of herding and animal husbandry during the emergence of marked social inequality in the Peruvian Andes during the first millennium CE. Aleksa's work has been enhanced by the important theoretical paradigms of perspectivism, posthumanism, and alternative ontologies to make sense of the role of animals in past daily and ceremonial activities. She began her zooarchaeology training in the Howard Savage Zooarchaeology Laboratory, under the tutelage of Dr. Max Friesen, a student of Howard Savage.

The Zooarchaeology of the Medieval Warhorse

Helene Benkert, Department of Archaeology, University of Exeter, UK,
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Carly Ameen, Department of Archaeology, University of Exeter, UK

Alan Outram, Department of Archaeology, University of Exeter, UK

Oliver Creighton, Department of Archaeology, University of Exeter, UK

The warhorse is arguably the most characteristic animal of the English Middle Ages. But while the development and military use of the warhorse have been intensively studied by historians, the archaeological evidence is too often dispersed, overlooked, or undervalued. We argue that to fully understand the cultural significance and functional role of the medieval warhorse, a systematic study of the full range of archaeological evidence for warhorses (and horses more generally) from medieval England is necessary. This requires engagement with material evidence at a wide variety of scales—especially the faunal remains of the horses themselves—from the late Saxon to the early Tudor period (ca. 800–1600 CE). We present here preliminary zooarchaeological and genetic results from our interdisciplinary research to produce new understandings about an animal that was an unmistakable symbol of social status closely bound up with aristocratic and chivalric culture, as well as a decisive weapon on the battlefield.

Bio: I completed my MSc in osteoarchaeology at the University of Sheffield, UK, and am currently doing my PhD at the University of Exeter, UK, under the supervision of Oliver Creighton and Alan Outram. I have a keen interest in equids, and after working on early Anglo-Saxon horses in Britain for my master's thesis I am now investigating medieval horses across Europe for my PhD dissertation.

Dama Mia: Investigating the Origins and Game Activity of European Fallow Deer in Sicily and Sardinia

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Karis Baker, Department of Archaeology, Durham University, UK

Naomi Sykes, Department of Archaeology, University of Exeter, UK

Holly Miller, Department of Archaeology, University of Nottingham, UK

European fallow deer have been manipulated by humans since the Neolithic, through translocations from their natural origins in Anatolia and the Balkans, for hunting, as symbols of prestige, and for religious and medicinal purposes. Fallow deer can thus serve as a proxy for trade and human–fauna interaction in the past. This study analyzed ancient and modern mtDNA; carbon, nitrogen, and oxygen isotope ratios; and osteometric data of European fallow deer remains from archaeological sites in Sicily and Sardinia in order to explore fallow deer origins and the extent of game activity and

movement of, and trade in, fallow deer in the Mediterranean from the Neolithic to medieval period.

The results of this study, including several outliers from isotope analysis, osteomorphologic groupings of astragali data, and an astragalus with a size suggesting mainland origins, in addition to the lack of Early Holocene evidence for fallow deer in Italy, suggest importation as the origins of Sicilian and Sardinian fallow deer rather than their being remnants of a refugia population, as previously thought. Furthermore, due to low genetic diversity in addition to negative and statistically significant ($p > 0.5$) Fu and Li's F test and Tajima's D test, a founder effect and subsequent expansion event is suggested. Additionally, this study observed gene flow between Sicily and Sardinia and a marked increase in fallow deer prevalence during the Roman and medieval periods, with an emphasis on younger male deer in the Sicilian sites, indicating a cull potentially motivated by hunting, religious, or medicinal purposes. While this preliminary evidence indicates imported origins, future research is necessary to fully understand the patterns observed and to pinpoint potential regions of origins for the ancient Sicilian and Sardinian fallow deer.

Animal Classification in Ancient China from the Late Neolithic to the Early Bronze Age

Ningning Dong, Institute of Archaeological Science, Fudan University, China, dongningning@fudan.edu.cn

Imposing the modern biological classification onto faunal remains from archaeological sites runs the risk of disguising folk categories in the past. In this study, an archaeological approach, integrating multiple lines of evidence and their depositional contexts, is attempted to dissect the relationship between taxonomy and the deposition of animal bones in the context of central China during the late Neolithic and the Early Bronze Age (ca. 5000–3000 BCE). Three sites are examined; they are Wadian, Wangchenggang, and Xinzhai. The results demonstrate a sharp contrast between Linnaean taxonomy and folk taxonomy in ancient China. First of all, age might have served as a critical categorical filter in ancient China. Secondly, the wild-versus-domesticated dichotomy, instead of synchronizing with the occurrence of domestication, seemingly was only established no earlier than the Shang Dynasty. Moreover, the boundaries between the two were porous. The last trait of animal categories in ancient China refers to their integration into a larger correlative scheme which aimed to explain the cosmos as a whole.

Bio: Ningning Dong is a junior research fellow at the Institute of Archaeological Science, Fudan University. She obtained her PhD in archaeology from the University of Cambridge, UK. Her main interest is zooarchaeology in early China.

Using ZooMS to Identify Sources of Osseous Raw Material at Iita, Northwestern Greenland

Erika Ebel, Department of Anthropology, University of California–Davis, USA,
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Genevieve LeMoine, The Peary-MacMillan Arctic Museum, Bowdoin College, USA

The archaeological site of Iita, in northwestern Greenland, is unique in the High Arctic due to the development of unmixed stratigraphic deposits documenting near-continual occupation of the past 1000 years. These layers present an opportunity to examine diachronic changes in the use of animals for food and as resources for raw materials. The first inhabitants of this site were the Late Dorset, whose material culture is distinguished by its artistic carvings. Around 1200 AD the site was occupied by Thule people, migrants from Alaska, and the precontact ancestors of the Inughuit who live in the region today. The lack of wood in this environment necessarily implies that bone, ivory, and antler were crucial raw materials for a variety of purposes, including tool making. The selection and processing of osseous raw material is expected to reflect changes in the way the two culturally distinct groups at Iita used the same resources in a shifting climate.

As osseous material is reduced, debris is left behind, often with distinct characteristics indicative of the technology and/or method used to create the final product or the steps of production in the *chaîne opératoire*. Often, this debitage has been modified to the extent that few diagnostic features remain. A sample of these small pieces of manufacturing debris will be identified to taxon using zooarchaeology by mass spectrometry (ZooMS) thereby improving the knowledge of species represented at Iita and the choices made by the tool makers. Together, the analysis of bone tools and faunal remains may provide further insight into the species represented in the archaeological record, improving our understanding of foraging and decision-making strategies of the Late Dorset and Thule.

Bios: Erika is a PhD candidate at the University of California–Davis and is currently studying animal bone remains from an archaeological site in Greenland.

Genevieve is curator/registrar of The Peary-MacMillan Arctic Museum, Bowdoin College. She has conducted research in the Canadian Arctic and northern Greenland for many years and studied zooarchaeology with Howard Savage in 1981–1982.

Multiple Ways to Use Eagles: A Case Study from the Castle of the Teutonic Order in Klaipėda, Lithuania (thirteenth–fourteenth century CE)

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Eve Rannamäe, Institute of History and Archaeology, University of Tartu, Estonia, eve.rannamae@ut.ee

In this paper, we examine archaeological eagle remains from Klaipėda Castle (Ger. Memel), western Lithuania. The castle was built in 1252, and during the Middle Ages it was the northernmost castle of the Teutonic Order in Prussia. The castle, together with its adjacent town, were subjected to wars and changing political situations over the centuries, but nevertheless represented a socially higher status. The studied bird remains were found during the excavations in 2016 and have been dated by context to the Middle Ages—from the end of the thirteenth to the beginning of the fourteenth century. We introduce and discuss two species, the white-tailed sea-eagle (*Haliaeetus albicilla*) and the golden eagle (*Aquila chrysaetos*). Most of all, we are interested in their role in expressing people's social status, use in material culture, and significance as a food source. For a better interpretation of our findings, we compare them to related evidence from the rest of the Baltic region within a wider timeframe. In several other regions, in the past, the eagles seem to have been used for hawking and food or killed due to their scavenging. In the Baltic area, however, as indicated by our results, the eagles were more probably used for raw material and possibly for feathers.

You're Gonna Need a Bigger Boat: An Analysis of Shark Tooth Artifacts from Precontact Florida

Aubrey Farrell, Florida State University

Sharks (class Chondrichthyes) are highly threatened apex predators that today demand great attention in the world of conservation. Their remains, primarily teeth and vertebral centra, are recovered from archaeological sites on every major continent. My master's research addresses how sharks' teeth were used by Indigenous people in pre-European-contact Florida and how their uses correlate with behavioural, social, and symbolic belief systems. First, a brief review of global shark and human relationships will be provided, which references a variety of archaeological texts and site reports as well as ethnohistorical documents. Then, the sample, which contains sharks' teeth from 16 sites, ranging from early Archaic to historic occupations and representing a minimum of 11 species, will be characterized. Archaeological evidence indicates that sharks' teeth were often modified to meet various technological needs and, in many cases, exhibit use-associated surface wear.

To explore this concept in the context of a Floridian assemblage, I employ a multimethod approach and conduct standard zooarchaeological procedures, scanning electron microscopy, and X-ray diffraction to investigate use-wear and residues associated with the sharks' teeth. This project seeks to understand how zooarchaeological evidence from Florida fits into the larger scheme of human and shark relationships. Additionally, the universal importance of sharks is stressed, not only as resources at humans' disposal, but also as a cultural resource associated with deep symbolism, human identity, and a multitude of anthropomorphic characteristics. Finally,

I suggest that in order to safeguard these animals that play a key role in our oceans, we must demonstrate our reliance on them not only biologically, but also culturally.

Cool Bones: Glimpses of the Non-Economic in Arctic Zooarchaeology

Keynote Speaker: Max Friesen, Department of Anthropology, University of Toronto, Canada

Zooarchaeology in Inuit Nunangat (Arctic Canada) is blessed by several factors, including the rich knowledge base of present and past Elders and Inuit historians, and the excellent preservation afforded by cold, dry environments. In other words, it is an ideal place to attempt to get beyond the economic value of mammals, birds, and fish, to their meanings in social, ritual, and other contexts. In keeping with the less formal nature of this workshop's opening night, this paper will give an impressionistic tour of some of the more interesting bones I've come across over the past 35 years, in several different regions. These examples will be drawn from various periods extending from the recent past back to occupations of more distant Inuit ancestors, and collectively hint at the complex networks of relationships that bound together people and non-human animals in the northern past.

Sharks and Precolonial Brazilian Coastal Groups: Let's Start to Think about Sociocultural Implications

Simon-Pierre Gilson, Museu Nacional do Rio de Janeiro, Universidade Federal do Rio de Janeiro, Brazil & Laboratório de Estudos Interdisciplinares em Arqueologia, Universidade Federal do Santa Catarina, Brazil, simonp.gilson@gmail.com

Andrea Lessa, Museu Nacional do Rio de Janeiro, Universidade Federal do Rio de Janeiro, Brazil

Precolonial Brazilian coastal sites are rich in shark remains. Vertebrae and teeth are frequently found inside the sediment matrix or as funeral deposits. This presence of shark teeth has been approached from zooarchaeological and ethnohistorical perspectives, along with experimental archaeology and use-wear analysis perspectives. The case study of the Rio do Meio site by these combined methods demonstrates relevant sociocultural implications. The chroniclers' reports on shark fishing by native groups showed: (1) tooth extraction was one of the main objectives for the capture of sharks; (2) teeth played a role in making throwing weapons; and (3) large sharks were fished close to shore, in shallow waters. Experimental archaeology allowed us to infer extraction of sharks' teeth through the use of heat from flames or hot water. Furthermore, the use-wear study confirmed the use of sharks' teeth as tools. The microwear is evidence of the use of teeth in the working of soft and semi-soft raw materials, with the associated gestures. The multiple use of the same tooth for different actions was also recorded. Moreover, it was shown that the fragility of sharks' teeth, not belonging to the jaw's first two rows, can be correlated with teeth discarded as material unsuitable for manufacturing tools, weapons, or even ornaments. The experiments also

demonstrated the use of sharks' teeth as projectile tips, which is in line with the written testimonies of the chroniclers. Finally, the study of the remains allowed us to reflect on the place of capture and the fishing technique, as well as the processing of shark carcasses and their transport.

Bio: Simon-Pierre Gilson holds a PhD from the National Museum of Rio de Janeiro and is currently a post-doctoral researcher at the Laboratório de Estudos Interdisciplinares em Arqueologia of the Federal University of Santa Catarina, Brazil. His main research topic is Brazilian coastal archaeology through the study of faunal remains and bone technology.

Narrowing the Gap: The Origins of Bronze Metallurgy for Daily Life Activities in the Southern Levant, with Zooarchaeological Data from Tall Zira'a

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Study of the origins and spread of tin-bronze metallurgy generally occurs through analysis of the stray metal finds that have survived through millennia. Most of these finds come from graves and are associated with elite behaviour. Over the past 20 years, we have presented a method by which tin-bronze can be identified through microscopic butchering slicing (cut) marks on bone. Over 20 assemblages from the Neolithic through the Iron Ages of the southern Levant have already been analyzed. These data have demonstrated that there is little to no evidence for tin-bronze slicing marks on bone during the Early Bronze Age and earlier periods. During the Middle Bronze II, metal slicing marks appear in sizable frequencies for the first time, and they grow increasingly more frequent afterwards. While a large data set has already been accumulated for the southern Levant, there is a significant temporal gap between the end of the Early Bronze III and the Middle Bronze II. It is not clear if metal knives are used for butchering during the 500 year long period known as the Intermediate/Early Bronze IV/Middle Bronze I. In this paper, we present data that narrows the time frame when metal knives begin to be used commonly for quotidian activities such as meat processing in households. We demonstrate with newly acquired data from the site of Tall Zira'a, Jordan, that metal knife marks do not appear during this intermediate period and only begin with the Middle Bronze II.

What Forces Shape Dorset Bone Needle Production in the Arctic?

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Though needles are small, their importance to Arctic peoples cannot be overstated. Given their importance, it is worth asking: What exactly do we know about the bone needles we find in the archaeological record in the Arctic? More specifically, I ask this question of the long-lived and widespread Dorset tradition (800 BCE–1300 CE). In this paper, I investigate Dorset needle technology by considering the forces which shape both the production process and the larger, more holistic technological system of needles. I take a comparative approach and argue that the technological system of the Inuit bone eyed needle is governed in large part by two major factors in Arctic life: seasonality and gender. I then use what we know about the influence of these factors at each phase of the system as a jumping-off point to theorize about whether the Dorset technological system looked similar or different. In addition, I present the results of my experimental reproduction of both a Dorset- and a Thule-style needle, which helped to increase my understanding of the bone needle production process, and by extension the larger technological system.

Bio: Zoe is a first-year MSc student studying Arctic archaeology at the University of Toronto. She completed her undergraduate at the University of Toronto and University College Dublin, and has participated in fieldwork in South Africa, Germany, and Ontario with various universities and in CRM contexts. She is most interested in thinking about climate change and landscape archaeology, and is using faunal analysis to pursue questions of this nature in the Arctic.

Coastal Exploitation in the Northern Maya Lowlands: Zooarchaeology and Current Marine Concerns

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Marine fisheries sustain the economy and welfare of coastal communities by providing food for more than 3 billion people and employment for at least 60 million people worldwide. However, many fisheries are currently collapsing, and more are in danger due to climate change, ocean acidification, overfishing, and pollution. One of the marine environments most affected by such conditions is estuarine environments in tropical regions. This communication presents a synthesis, with a back-to-the-future approach, of the dynamics in coastal exploitation practices in the northern Yucatán coast during environmentally stressed periods, such as the transition from Classic to Postclassic, when dryer and warmer conditions have been reported in the Maya area. The effects of the droughts reported during the end of the Classic period have been traditionally studied at inland sites, but the effects of these conditions have not been deeply evaluated along with Maya coastal settlements.

Based on zooarchaeological analysis at coastal sites of the Northern Lowlands, the ecological and social implications of the droughts reported in the Terminal Classic are evaluated. The results show that environmental changes and anthropogenic pressures favoured fluctuations in the frequency of fish species, modification in mean trophic levels, reduction in sizes of fishes caught, and changes in biogeography. In this sense, this work offers a contribution to the understanding of Mayan coastal exploitation and adaptations during episodes of climate change. In addition, to provide a basis for improving our understanding of prehispanic Maya fisheries, this work can also contribute to enhancing our understanding of current fisheries in the region.

Bio: I am a zooarchaeologist working at the Universidad Autónoma de Yucatán interested in the study of human adaptations in coastal environments through the study of fish remains. My research aims to provide ecological baselines for the identification of healthy tropical fisheries in preindustrial times and to evaluate the anthropogenic effects on fish population in the Yucatán from a long-term perspective.

Toothless Sheep and Scrawny Cows: An Examination of Potential Links between Skeletal Pathologies and Environment Deterioration in South-eastern Turkey

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The end of the Late Bronze Age in the eastern Mediterranean was marked by the disintegration of large political entities, such as the Hittite Empire. While this process could not be ascribed to a single cause or a purely external force, a climatic event which brought a period of drought and which contributed to deterioration of the environment and natural resources is one of the factors frequently discussed by scholars studying the tumultuous period of transition from the Late Bronze Age into the Iron Age. In the zooarchaeological record from across Anatolia and what is today northern Syria, several scholars have observed an increase in pathological skeletal elements among domestic animal species. In some cases, the increased frequency and severity of skeletal pathologies in domestic mammals were ascribed to agricultural intensification, poor knowledge of animal husbandry, or mistreatment of animals by their herders. In other cases, raising animals in suboptimal conditions, caused by unprecedented bouts of dry weather and consequent plant cover reduction, has been interpreted as one of the main causes of pathological lesions on animal bones. This study examines pathologies on skeletal remains of domestic mammals from Kinet Höyük, a small harbour site in the northeastern corner of the Mediterranean. It aims to determine whether there was a significant increase in the frequency and severity of skeletal pathologies towards the end of the Late Bronze Age and subsequent periods, and if some of those occurrences could be linked to the aforementioned climatic event.

The Emergence and Evolution of Neolithic Cattle Farming in Southeastern Europe: New Zooarchaeological and Stable Isotope Data from Džuljunica-Smārdeš, Northeastern Bulgaria (ca. 6200–5500 cal BCE)

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Domestication of cattle (*Bos taurus*) and its subsequent spread into Europe led to unprecedented economic, biological, and social transformations. Little is known about the early interactions of humans with this animal in Neolithic Bulgaria, a key region with connections to northwestern Anatolia (via Thrace or the Black Sea coast), the Aegean world (via the Struma and Mesta valleys), and central Europe (via the Danubian corridor).

Integrated zooarchaeological and stable isotope analysis of faunal remains from Džuljunica, one of the earliest and most well-stratified Neolithic settlements in the southern Danube catchment, spanning the end of the 7th millennium BCE and the first half of the 6th millennium BCE, provides us with ample opportunity to contribute to this discussion. In this paper we use biometry, age at death data, and stable isotope analysis ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$) of collagen and tooth enamel to obtain insights into the modalities of cattle farming, cattle grazing environment, slaughtering pattern, and calving season in relation to the environmental and cultural settings of this initial Neolithic settlement. The results of this study contribute to understanding the Neolithization itineraries of Europe, and modes of adaptation and experimentation in early cattle farming in the Balkans.

Bio: Safoora Kamjan is a PhD candidate at the Groningen Institute of Archaeology. Her research project is focused on how diverse early human–cattle relationships, modalities of cattle husbandry, and human dietary patterns were in different geographical and cultural settings. This study utilizes traditional zooarchaeological methods and stable isotope analysis on Neolithic faunal remains from early farming communities in Turkey, Bulgaria, and the Netherlands to investigate the role of farmers' decisions and geographical constraints on cattle size, slaughtering patterns, mobility, seasonality of birth, diet, and the contribution of cattle protein (beef and milk) to human diet.

Sizing Up Selection: Exploring the Evidence for Horse Types in the Hungarian Bronze Age

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Locating selective breeding in early domesticated horse (*Equus caballus*) populations has held a sustained interest for zooarchaeologists and horse historians alike. Size changes may divulge domestication status, reflect different environments or nutrition, or may be a proxy for selection changes by managed breeding. The presence of domesticated horses identified by aDNA has been established in Hungary by ca. 2000 BC at the latest, the transition between the Early and Middle Bronze Age. Examining the size of these horses for evidence of purposeful breeding is important to explore human–horse relationships, as well as whether horses were being purposefully bred for exchange, resulting in their commodification as a trade good. At the same time in the Hungarian Bronze Age, there is good evidence for selective breeding of woolly sheep and dairy cattle, so it follows that people may have been similarly selecting for specific characteristics in horses.

Over 50 years ago, the Hungarian zooarchaeologist Sándor Bökönyi identified major size differences in Iron Age horses. Horses from eastern Europe (Hungary, Slovenia, Russia, Bulgaria) were significantly larger in size than horses from western Europe (Austria, Germany, Switzerland). He supposed that this process started in the Bronze Age. I have previously found that withers height in horses increased steadily in the Hungarian Bronze Age, while robusticity of the metapodia decreased and variance in robusticity rose significantly. In this paper, I explore the evidence for selection of particular types of horses, or for potentially more comfortable riding horses, based on the Logarithmic Size Index (LSI) of horse bones from seven sites. I compare these results with later and earlier assemblages and combine this data with evidence for local breeding with some exchange of horses. Ultimately, this comparative approach allows the interpretation of the roles of horses in the lives of Bronze Age peoples.

Bio: Katherine Kanne is a lecturer at Northwestern University. She is an anthropological archaeologist engaged in investigating the origins and spread of equestrianism in the European Bronze Age, the development of mounted warfare, and their effects on the long-term trajectory of sociopolitical and anthropogenic change.

Come One, Come Awl: An Analysis of Tempering Methods of Bone Awls in Neolithic Europe and Western Asia

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The investigation of secondary manufacturing methods, or “tempering,” in the creation of bone tools is an essential part of understanding how organic materials have been utilized in the past. Through a preliminary experiment, this study reveals that actions

such as burning, polishing, and heating have noticeably different effects on the use of bone tools. Actions such as polishing increase the effectiveness of awls for use in leather working, while different methods of heating do not have any effect or are noticeably detrimental to their use for leather working. These results indicate that secondary production could have been a method of differentiating use of a tool type with a notoriously large range of potential actions associated with it. This opens the way for a new understanding of why secondary manufacturing processes were utilized, and what they tell us about the relationship between humans and domesticates during the Neolithic.

Bio: Patrick Keenan is a master's student at the University of Toronto whose research is aimed at understanding the effectiveness of 3D photogrammetry in the analysis of bone tools. His research focuses on the Neolithic in the Republic of Georgia, as well as the Near East more broadly.

Zooarchaeology Beyond Food: Osteobiographies of Early Medieval Dog and Pig Skeletons at the Divičmeđ site (Serbia)

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Velibor Katić, Belgrade City Museum, Serbia

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Zooarchaeological studies of the early medieval contexts are very scarce in present-day Serbia. Only a few studies dealing with the role of animals in funerary rites or the animal economy of settlements are currently available. For the first time, a detailed analysis of two complete animal skeletons from one early medieval settlement in the country will be presented in this paper. Excavations at the multilayered archaeological site of Divičmeđ in central Serbia have revealed the remains of a fortified early medieval settlement dated to the tenth–eleventh centuries. The excavations inside the settlement ramparts, among other features, revealed an oven most likely used for pottery production. A completely preserved dog skeleton was discovered at the bottom, while a pig skeleton was found in the oven's upper layers. These skeletons indicate secondary use of the oven and prompt further questions about possible cultural impact and depositional scenarios, and they also shed light on the everyday life management within the settlement. In this paper, an interdisciplinary approach will be applied to dog and pig skeletons, which will further give us a rare opportunity to reconstruct their osteobiographies. Radiocarbon dating of the skeletons will provide us with the absolute chronology necessary for a better understanding and reconstruction of deposition processes. This study will also help us to address research questions about broader contexts of human–animal interactions in the country during the early medieval period.

Bio: Dr. Nemanja Marković is a research associate and zooarchaeologist at the Institute of Archaeology, Belgrade. The focus of his research is the reconstruction of past human–animal relationships, mainly on the topics of animal economy, strategies in animal husbandry, and palaeopathology. While studying several topics over the past decade, he analyzed animal remains from the Early Neolithic to the Early Modern period, and those projects provided him broad expertise in zooarchaeology. Together with veterinary scientists, he started pioneering research in the field of animal palaeopathology in the central Balkan area.

Mining Howard Savage’s Legacy: Assessing Zooarchaeological Data Quality in Undergraduate Student Faunal Reports

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During the 22 years Howard Savage taught the faunal archaeo-osteology lab course at the University of Toronto, his students produced approximately 400 reports. This represents an enormous amount of labour, as well as a significant potential data source that remains untapped. The data in these reports could be used for future big data projects, if it were possible to determine with reasonable confidence that the taxonomic identifications are largely correct. In this paper, we outline an experiment in which we develop and use a set of standard criteria to evaluate the data quality of five reports from a total of three archaeological sites. We then compare the data from these reports with datasets generated by us from the same sites. This comparison will aid in consideration of the usefulness of undergraduate student reports by future researchers. We focus on taxonomic identifications from Late Woodland Indigenous sites in Ontario, but this strategy has the potential to be applied to other types of zooarchaeological reports from other regions of the world.

Bios: Trevor Orchard has been learning about and practising zooarchaeology since the late 1990s. Trevor’s initial introduction to and training in zooarchaeology took place under the mentorship of Rebecca Wigen and Susan Crockford, at the University of Victoria. While he did not have the pleasure of working directly with Dr. Savage, Trevor did complete his PhD research at the University of Toronto, working with Dr. Max Friesen and carrying out much of his analysis in the comparative laboratory facility created by Dr. Savage. Currently, Trevor manages the extensive zooarchaeological comparative collection at the University of Toronto Mississauga, which was started and largely created by Debbie Berg.

Suzanne Needs-Howarth was somewhat of an archaeological omnivore until she took Dr. Savage’s faunal course (1989–1990) and unexpectedly found her vocation. She went on to do an MSc (Toronto) and PhD (Groningen) focusing on methodological and interpretive aspects of Iroquoian faunal material. She continues to pursue this

research interest today in various collaborative projects, using data generated through her consulting work. In non-pandemic times, she still makes grateful use of the reference collection Dr. Savage created.

Alicia Hawkins was possibly Dr. Savage's penultimate teaching assistant. She took the course in 1990–1991 and went on to TA for him twice, by which time she had memorized most of his jokes and possibly some of the important information in his handouts. Alicia is a generalist, and zooarchaeology is one of her current research areas. With the assistance of many students and even more bugs, she built the zooarchaeology reference collection at Laurentian University, from a wired-together beaver, a muskrat on a board, and a partial dog in a plastic bag, to a collection of hundreds of specimens of Ontario species. She teaches zooarchaeology occasionally, building from the foundations laid by Dr. Savage.

The three of us have been collaborating actively for the past five years on various projects relating to zooarchaeological methodology and zooarchaeological practice in this part of the Great Lakes region.

The Making of an Antler Harpoon Head: Iron vs. Slate and Implications for Production

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Caribou antler was prized by the Thule culture as a raw material due to its widespread abundance and versatility. It follows that antler harpoon heads were a crucial element of the Thule toolkit due to the marine-focused lifestyle of the Thule culture. While the techniques and gestures used for general antler reduction processes have been documented, the differential effect of iron vs. slate tools on antler reduction remains to be seen. Replicating the production process of an antler Thule Type II harpoon head using both iron and slate knives revealed that iron knives are functionally more effective. The differing levels of functionality affected the length of the production process, as the slate blade was less durable and precise, and adjustments must be made in order to effectively produce antler harpoon heads using slate knives. Additionally, this experimental reproduction demonstrates how the characteristics of antler may have affected decisions related to the production process, such as pre-treatment. Ultimately, replicating the production process of an antler harpoon head identified changes in the production process as a result of using iron vs. slate knives, as well as pre-treatment steps that working with antler requires.

Bio: I am a first-year PhD student specializing in the archaeology of the Canadian Arctic and working with Dr. Max Friesen, at University of Toronto. This project was originally prepared for Dr. Heather Miller's Ancient Technology class.

An Investigation of Agouti (*Dasyprocta*) Introduction to the Precontact Lesser Antilles

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The agouti (*Dasyprocta* sp.) is one of the many commensal species Indigenous Islanders introduced to the Caribbean from South America during the Ceramic Age (500 BCE–1500 CE). Its widespread archaeological presence and relatively high abundance throughout the Lesser Antilles makes it a valuable proxy for reconstructing Indigenous human lifeways. This paper presents a multi-evidentiary investigation of agouti introduction to the precontact Caribbean. Mitochondrial DNA was successfully amplified from 26 archaeological agouti specimens from three islands, Carriacou, Martinique, and Saint Martin. Precontact agouti Island occurrence and chronology was synthesized through a review of Caribbean agouti archaeological records. Results emphasize the significance of agouti zooarchaeological remains for reconstructing Indigenous Islanders' mobility and for determining the ecological impacts of introduced fauna on the Islands.

Bio: Sophie graduated in August 2020 from Simon Fraser University, Canada, with an MA in archaeology. Her thesis, entitled *A Novel Commensal Proxy for Tracing Indigenous Interaction in the Ceramic Age Lesser Antilles, Caribbean: Ancient Mitochondrial DNA of agouti (Dasyprocta sp.)*, was conducted under the supervision of Dr. Christina Giovas. She will begin a PhD in bio-anthropology at the University of Cambridge, UK, in April.

Exploring Variability in Neolithic Bone Awls from Georgia, Southern Caucasus

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Bone tools form a large and important part of the material culture recovered from sites of the Late Neolithic Shulaveri-Shomutepe culture of the southern Caucasus region of Georgia, Armenia, and Azerbaijan. Bone awls are the most common tools represented in these assemblages, and these awls display a significant degree of variability in form, size, raw material, manufacture, and use. In this discussion, I will focus on the largest subset of these awls, those made on the distal metapodia of sheep and goat. The goal of this study is to explore the choices made by the toolmakers by investigating the relationship of form and function amongst these awls. I will examine the awl assemblages from the sites of Gadachrili Gora and Shulaveris Gora, Georgia, excavated by a joint team from the University of Toronto and the National Museum of Georgia.

Exploring Human–Fox Relationships During the Early Neolithic in Yorkshire, England

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In southern England, the red fox is infrequently recovered from the built environment of the Early Neolithic. When encountered, it is either considered “intrusive” (due to its burrowing behaviour) and quickly removed from archaeological histories or is theorized as either technology (fur) or playing a role within human cosmologies (Serjeantson 2011, Pollard 2008). This paper presents an archival re-examination of *Vulpes vulpes* remains from the Early Neolithic in Yorkshire. Yorkshire represents a “no-man’s land” for recent enquiry, no doubt due to its poor publication record from recent excavations (from the last 60 years) and limited details from the 1500 or so barrows excavated by antiquarians in the latter half of the nineteenth century. I apply a whole-archive approach to several private and public archives in order to correct this geographical bias. Considering the red fox as an active agent, with its own agency and autonomy, I wish to offer a perspective which de-centres the human from these complex historical relationships, by applying a mutual, multi-species reading of the archaeological evidence, considering themes of architecture and Anna Tsing’s (2017) concept of “auto-rewilding.”

Tsing, Anna 2017 The Buck, the Bull, and the Dream of the Stag: Some Unexpected Weeds of the Anthropocene. *Suomen Anthropologi* 42(1):3–21.

Bio: I am a second-year PhD candidate at Birkbeck, University of London. My dissertation title is *Animal Architecture: An Integrated Approach to the Built Environment of the Early Neolithic in Yorkshire*.

Fear, Feast, Cult, and Taboo: Aurochs in Neolithic Anatolia

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Aurochs (*Bos primigenius*) were the most fearsome, most dangerous, most sought after, and largest hunted ungulate in Neolithic Anatolia. Except for a few settlements, most Pre-Pottery Neolithic sites in Anatolia yielded a large number of aurochs remains, and some sites yielded exceptionally large assemblages of aurochs, comprising 40–50% of total identified specimens. In the early phases at Çatalhöyük, aurochs and cattle collectively comprised about 60–80% of the meat yields at the site. Aurochs also continued to supply significant meat requirements at late Neolithic sites, such as Ilipinar, Tell Kurdu, Domuztepe, and Höyücek. On the other hand, aurochs played a central role in Neolithic symbolism, being one of the most significant animals of supernatural beliefs, communal feasts, and rituals. Some sites, such as Çayönü, Göbeklitepe, Boncuklu Höyük, Musular, Çatalhöyük, and Köşk Höyük, revealed aurochs-related special

buildings, symbolic artifacts, rituals, and cultic assemblages, ranging from the tenth to sixth millennium BC. Particularly, some special strata at Çatalhöyük yielded male and female cattle buried in pairs, suggesting that aurochs/cattle mothers and fathers might have had an equivalent status to human ancestors.

Overall, Anatolians were regularly hunting aurochs in order to obtain meat and other animal products for their survival; at the same time, aurochs became an animal of respect and spiritual value, as well as a symbolic icon and totem throughout the Neolithic. Consequently, the interactions and relationships between aurochs and humans turn out to be multidimensional and complex, as well as deeply influenced by one another. Beyond a simple hunter–hunted relationship, with a combination of zooarchaeological remains and cultural assemblages, this study aims to explore the complexity and deep extent of aurochs–human relationships in Neolithic Anatolia, which continued for over four millennia.

When Leftovers Become a Tool

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Since autumn 2013, a team of international multidisciplinary researchers (Realities of Life project, directed by the authors) has been studying archaeological material from Elephantine Island, Aswan, Egypt, with the aim to gain new insight into daily life in an ancient Egyptian settlement. The focus of the project is so-called House 169, dating to around 1800 BCE (late 13th dynasty), in the northwestern quarters of the Pharaonic town. Within the well-preserved stratigraphic features of this building (but to a limited extent also in neighbouring and earlier-dating houses) multiple tools, jewellery items, and other household articles made from faunal raw materials have been recovered. They add insight into the perception of the space within the house(s) by the former inhabitants gained from other finds and features, provide proof of craft production activities and of attempts to keep the living environment clean. They also enable us to reflect on the economic networks of the townspeople in the region of the first Nile cataract and beyond.

This paper will discuss the finds from a building of which, due to refurbishments by the owners during its lifetime, the last 100 years of occupation can be traced in detail. It will address the question of how closely the inhabitants of House 169 and its contemporary neighbours lived together with their household animals. And it will present various steps in the use-life of, for example, bones, shells, and feathers subsequent or in addition to the animals' function as foodstuff. Last but not least, it will briefly address the question of local resource vs. imported item and technology, especially in the cases of ostrich eggshell and mollusc shell.

Bio: Johanna Sigl holds a PhD in Egyptology with a focus on zooarchaeological research in Egypt. Since 2003, she has been doing archaeological fieldwork in Egypt. In autumn 2013, she started her project Realities of Life, within the scope of the German

Archaeological Institute Cairo's project Elephantine, in Aswan, Egypt. Since 2019, she has been enrolled in the German Research Foundation (DFG)-funded priority program Entangled Africa, at the Commission for the Archaeology of non-European Cultures (KAAK) in Bonn, Germany. Her research interests focus on culinary history, food and tool production, realities of ancient daily life and—within the scope of her master's thesis project on looms of the 1st millennium CE in Egypt—technical aspects of textile production.

Testing the Theory of Animal Left–Right Symbolism in Ancient Maya Ritual Practice

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In most world regions, “handedness” carries cultural significance, and this is also the case in the Maya world. In Classic and modern Maya cosmology, the right side of an entity's body is associated with men, power, life, and purity, while the left side of the body is associated with women, weakness, death, and ritual. The left side of the body is also associated with wild animals, while the right is associated with domestic animals, and ethnohistoric documents suggest that animal body portions provided as tribute to rulers and religious personnel were also sided, with left-sided body portions provisioned for ritual offerings and right-sided portions offered as tribute to the rulers. Mary Pohl has argued that this right–left symbolism is reflected in zooarchaeological assemblages in the Maya area and that these are linked to ritual practice in the use of animal body portions and in their deposition. In this study, we test this hypothesis using our own and published zooarchaeological data from putatively “ritual” and “non-ritual” animal assemblages from across the Maya area. We find that although sidedness may have been an important part of animal use, it is not easily or clearly linked to ritual practice. For the authors of this paper, Doc Savage's class was the beginning of a long and fruitful collaboration in Mesoamerican zooarchaeology. Many of the datasets used in this study come from his own work on materials from Belize cave sites, so we are doubly indebted to him for his contributions to our work.

Pohl, Mary 1983 Maya Ritual Faunas: Vertebrate Remains from Burials, Caches, Caves, and Cenotes in the Maya Lowlands. In *Civilization in the Ancient Americas*, edited by Richard M. Leventhal and Alan L. Kolata, pp. 55–103. University of New Mexico Press, Albuquerque.

Bios: Kitty Emery was a student in Howard Savage's zooarch class in 1986–1987, during her MA degree program. She received her PhD in 1997 and is now Curator of Environmental Archaeology at the Florida Museum of Natural History, University of Florida, where she specializes in the zooarchaeology of ancient Mesoamerica. She therefore blames her entire career on falling in love with zooarch in Doc Savage's class.

Norbert Stanchly graduated from the University of Toronto with a degree in archaeology. Immediately after completing Dr. Savage's course in 1990, he was invited to participate in the Trent University archaeological field school in Belize, Central America, as a faunal research assistant. Norbert has conducted zooarchaeological research in Belize since 1990 and is currently the project zooarchaeologist for the Belize Valley Archaeological Reconnaissance Project and the Pacbitun Regional Archaeological Project. He has analyzed faunal assemblages from more than two dozen Maya sites in Belize.

Animal Beauty: Use of Skeletal Elements for Decorative Purposes in the Neolithic in Southeastern Europe

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Diverse skeletal elements (bones, antler, teeth, mollusc shells) were widely used for the production of diverse artefacts since Palaeolithic times. They were used for everyday tools and hunting and fishing weapons, but they were also frequently selected for making decorative items, both because of their physical and mechanical properties, and because they had some symbolic value. This paper will present decorative items made from animal skeletal elements from the Neolithic period in the Balkan area, with a special focus on the Early and Middle Neolithic Starčevo culture and the Late Neolithic Vinča culture. Although stone and clay were used for jewellery as well, the main raw materials were those of animal origin. Analyses of the raw material selection, typological repertoire, and symbolic aspects will be explored. Teeth from both wild and domestic species were used for making simple pendants. Bone and antler were used for making diverse buckles, decorative pins, pendants, and some of the ornamental pieces produced are quite extraordinary in terms of labour, skill, and time invested in their production. Particularly interesting is the presence of ornaments made from imported mollusc shells, which were certainly symbols of status and prestige. Ornaments made from osseous raw materials were usually used for a long time and sometimes repaired and recycled. Osseous raw materials were chosen for their physical properties—hardness, smooth surfaces, and bright, shiny white colour. They also had symbolic value, perhaps linked with these properties, rarity and/or origin from certain animal species. This symbolic value is difficult to reconstruct; it is possible they were used to display individual status and prestige.

Thank Yous

We would like to thank our keynote speaker, Dr. Max Friesen, for carrying on Howard's traditions, sharing his bone stories (and Howard's), and supporting FIG. Thank you to all the presenters for sharing their time and research, and to our moderators for helping to facilitate the presentations. We would also like to thank our sponsors, the Archaeology Centre and the Department of Anthropology at University of Toronto, for their generous support. We would like to thank Dr. Hilary Duke and Ken Holyoke in particular, for their time, effort, and skills in helping us put together what we hope will be an engaging experience for all our faunal friends. Many thanks as well to Dr. Lesley Howse and Dr. Genevieve Dewar for first establishing the FIG in 2007. Most of all, a HUGE thank you to the Organizing Committee for countless volunteer hours to get us all together for a couple of great bone days!