51st Annual Meeting of the Canadian Association for Biological Anthropology/L'Association canadienne d'anthropology biologique

October 30-November 2, 2024

Delta Armories by Marriot

London, Ontario

Traditional Territories Acknowledgement

Western University acknowledges that we are located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Chonnonton Nations, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum.

We respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples (First Nations, Métis and Inuit) endure in Canada, and we accept responsibility as a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.

London CANADA

CABA - ACAB est. 1972

Western UNIVERSITY · CANADA

The organizers would like to extend their appreciation and thanks to the following sponsors for supporting the hosting of the 2024 Annual Meeting here in London.

Sponsors

Western University SSHRC Exchange Grant

Western University Faculty of Social Science

Western University Department of Anthropology

Western

TOURISM London CANADA

Donors

We are grateful for the generosity of past and current members for their support of CABA-ACAB.

Bone Clones, Inc.
OSTEOLOGICAL REPRODUCTIONS

OXFORD UNIVERSITY PRESS Canada

Pearson

CRC Press
Taylor & Francis Group
Go to www.crcpress.com

France Casting
Better Than Bone Museum Quality Replicas

Organizing Committee for CABA-ACAB 2024

Organizing Committee

Andrea Waters-Rist, Andrew Nelson, Jay Stock, Ian Colquhoun

Virtual Meeting Organizers

Matt Tocheri, Anneleise Eber

Volunteers

Daniel Amacker, Hanne Andersen, Isaac Bender, Sarah Bidinosti, Katie Brent, Sabrina Cherian, Megan Davies, Michael Duncan, Avery Dowling, Mackenzie Kerr, Dima Kassam, Christina Lama, Charmaine Lovatt, Naomi Nakahodo Moromizato, Hana Salahuddin, Elyse Scheid, Maris Schneider, Sydney Holland, Maddie Hertz, Sorcha Rountree, Chloe Vicente-Sarmento, Panchala Weerasinghe, Kate Woodley, Jackie Ziqi

Student Luncheon Coordinator

Katie Brent

Student Luncheon Guest Speaker

Dr. Michael Berthaume

Information for Presenters and Attendees

Podium presenters: Please be present to load your presentation onto the laptop (the machine is a PC) in the morning before sessions begin or during the coffee/lunch break prior to your talk. A student volunteer will be present to assist. Oral presentations are allotted 15 minutes each, including time for questions and discussion.

Poster presenters: Posters are scheduled to be up all day Thursday and Friday in the Gunnery Ballroom. Please put your poster up at the location corresponding to your poster number. A student volunteer will be present with supplies for hanging posters and to provide assistance as needed. Please take your posters down by the end last session on Friday.

Online attendees: We are using the same Zoom link for all three days. Here is the web address, meeting ID, and password. You will be automatically muted upon entry and we ask that you turn off your video. If you have a question for a presenter you can either (1) put your question in the chat and, if there is time, a volunteer will ask it on your behalf, or (2) raise your hand and, if invited by the volunteer monitoring Zoom, unmute yourself and ask the question yourself.

Join Zoom Meeting: https://westernuniversity.zoom.us/j/94258099208?pwd=aD1g10gyr2CCPf3e20ou41qmcVZDKS.1
Meeting ID: 942 5809 9208
Passcode: caba2024

To view the posters online, go into our CABA-ACAB 2024 interactive virtual space in GatherTown at: **https://app.gather.town/app/vWlHjnJME6Gg2wEp/CABA-2024**. This is the place to not only check out the posters but also to meet up with any of your colleagues who are not attending in person. You can also watch the talks over Zoom from this space. Follow the link above and you will be taken to a site that asks you to enter your name (please enter your first and last name in full), given an avatar that you can customize, and then you will enter Gather Town which has a pixelized video game aesthetic. In the space, you use your arrow keys to walk your character around the rooms. You can have text or video conversations with other attendees and explore the posters. No password is needed to enter the room. Have fun! Questions about GatherTown can be addressed to Matt Tocheri or Anneleise Eber. or by email at tocherim@gmail.com and aneber@lakeheadu.ca.

Conference WiFi access:
Network: MarriottBonvoy_Conference
Delta Armories Password: YXUDLMTG

Canadian Association for Biological Anthropology / l'Association canadienne d'anthropologie biologique

Mission Statement

The Canadian Association for Biological Anthropology / l'Association canadienne d'anthropologie biologique is a learned society of international scholars and students whose aim is to promote and increase awareness and understanding of biological anthropology among its membership, as well as to supporting institutions and agencies and the public at large. Biological anthropologists study adaptation, variability and evolution in a biocultural context. Our members recognize and celebrate the geographic and temporal diversity and complexity of ancient and modern humankind, our hominin forebears and our nonhuman primate cousins and their ancestors. As such, our discipline is inherently multidisciplinary, crossing the boundaries between the natural and social sciences, in order to provide a richer understanding of human diversity and complexity.

Énoncé de mission

L'Association canadienne d'anthropologie biologique / Canadian Association of Biological Anthropology est une société savante internationale, composée de chercheurs et d'étudiants, dont le but est de faire connaître et comprendre l'anthropologie biologique, non seulement à ses membres, mais aussi aux institutions et aux organismes de soutien ainsi qu'au grand public. Les chercheurs en anthropologie biologique étudient l'adaptation, la variabilité et l'évolution dans un contexte bioculturel. Nos membres reconnaissent et célèbrent la diversité géographique et temporelle et la complexité de l'humanité ancienne et moderne, de nos ancêtres hominidés et de nos cousins primates non humains, ainsi que leurs ancêtres. En tant que telle, notre discipline est multidisciplinaire par nature, traversant les frontières entre sciences naturelles et sciences sociales, afin d'atteindre à une plus grande compréhension de la diversité et de la complexité de l'humanité.

Déclaration de respect pour la diversité et l'inclusion

Notre organisation encourage la reconnaissance et le support de la diversité parmi ses membres et valorise l'inclusion de personnes ayant des perspectives et des expériences diverses. Nous nous engageons à fournir un espace accueillant et sûr aux scientifiques et aux membres de la communauté universitaire, quels que soient leur sexe, leur origine ethnique, leur âge, leur apparence physique, leur orientation sexuelle, leur identité de genre, leur handicap, leur situation financière, leur religion, leur origine nationale, leur identité culturelle, leur grossesse, leur statut parental ou matrimonial, leur statut d'immigrant, leur affiliation universitaire ou tout autre aspect ayant trait à leur identité. Nous cherchons à tout moment à atténuer les dommages causés par les iniquités au sein de notre organisation. Nous reconnaissons l'histoire des terres sur lesquelles nous nous rassemblons et perpétuons notre engagement à décoloniser nos interactions professionnelles par le biais d'approches communautaires inclusives. L'intimidation, le harcèlement ou les formes de comportement discriminatoires n'ont pas leur place dans notre société. Tous les membres doivent être traités avec dignité et respect et doivent adhérer au code d'éthique de l'ACAP-CAPA, ainsi qu'aux codes auxquels ils sont engagés par le biais d'affiliations institutionnelles ou autre.

Statement of Respect for Diversity and Inclusion

Our organization embraces diversity among its membership and values the inclusion of people with diverse perspectives and backgrounds. We commit to providing a welcoming and safe space for scientists and scholars regardless of sex, ethnicity, age, physical appearance, sexual orientation, gender identity, disability, financial situation, religion, national origin, cultural background, pregnancy, parental or marital status, immigration status, academic affiliation, or any other aspect of identity. We seek at all times to mitigate the harms caused by inequities within our academy. We acknowledge the lands on which we gather and our continuing commitment to decolonizing our professional interactions through community-engaged approaches. Bullying, harassment or discriminatory forms of behaviour have no place within our society. All members are to be treated with dignity and respect and are expected to adhere to the CABA-ACAB Code of Ethics as well as any such codes by which they are bound through institutional or other affiliation.

Mental Health and Safety Resources

London Police Services Emergency: **911**

London Police Non-Emergency: **519-661-5670**

Foot Patrol: **519-933-1542**

CMHA Thames Valley Addiction and Mental Health Services - London

Crisis Centre: **1-866-933-2023**

London Mental Health Crisis Service (call or text): **519-433-2023**

Online chat: **https://reachout247.ca/get-help/web-chat/**

Canada Suicide Prevention Service (call): **1-833-456-4566** text: **45645**

Website: **https://talksuicide.ca/**

National Domestic Violence Hotline: **1-800-700-7233**

Ontario Victim Support Line: **1-888-579-2888**

Assaulted Women's Hotline: **1-866-863-0511**

Trans Lifeline Phone: **1-877-330-6366**

Compass Community Services LGBTQ+ Support Line: **266-669-3760**

Indigenous Wellness Resources

National Indian Residential School Crisis Line: **1-866-925-4419**

Indigenous Hope for Wellness Helpline: **1-855-242-3310**

Atlohsa's Family Healing Services: **1-800-605-7477**

Hospitals in London

University Hospital London Health Sciences Centre: 339 Windermere Rd

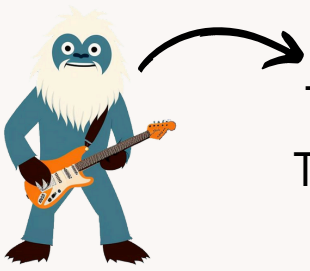
St. Joseph's Hospital: 268 Grosvenor St

Victoria Hospital: 800 Commissioners Rd

London CANADA

Your conference name tag allows CABA-ACAB attendees to show their badge and obtain special offers and discounts at London businesses, including entertainment, retail and local restaurants!

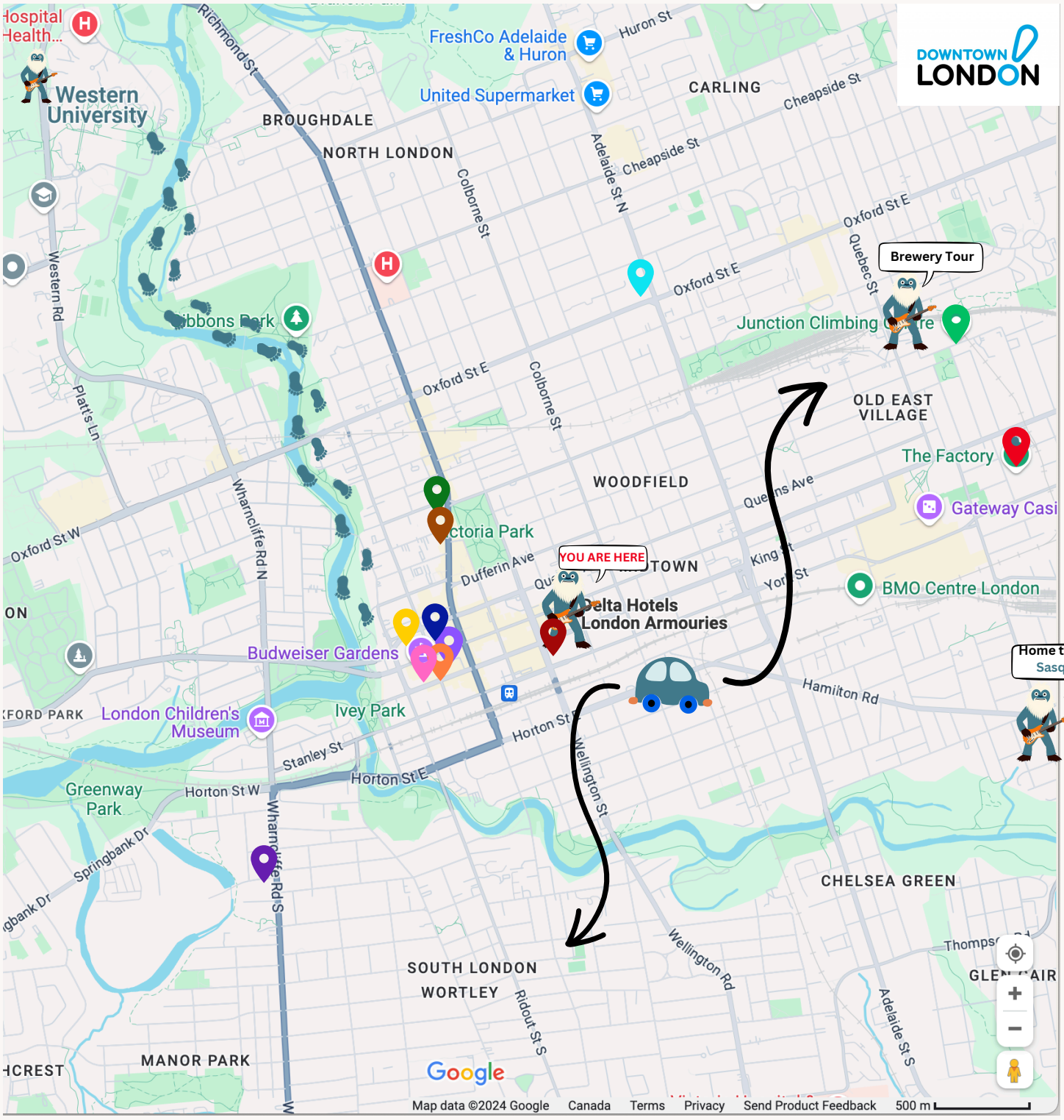
Click **HERE** to learn more



The restaurant at the Delta will not be open for lunch on Thursday and Friday. Check out my recommendations for food on the next pages!

Complementary London City Transit passes (limited quantity) will be available for pick up at the registration desk

Map of Downtown



***The EOA Sasquatch:** https://www.cbc.ca/news/canada/london/sasquatch-spotted-on-hamilton-road-in-london-1.4403058

We recommend driving, Ubering, cabbing, or busing from Delta to Wortley, Old East Village, or Masonville

Things To Do

London Brewery Walking Tour

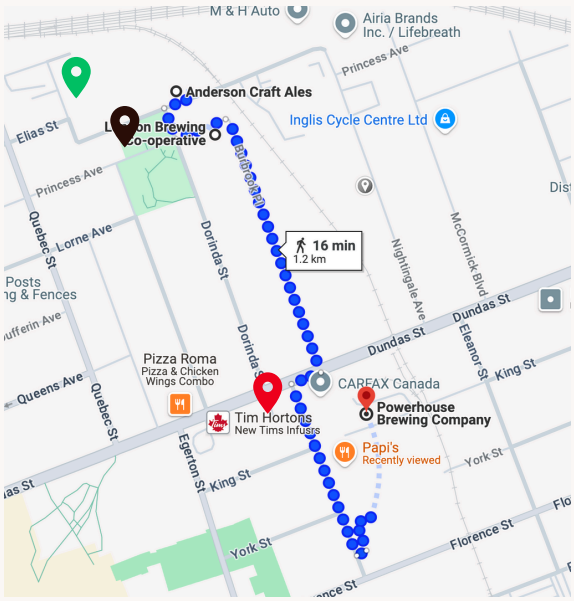
Anderson Craft Ales
1030 Elias St. (Old East Village) (3.1km*)

0.59 km

London Brewing Co-op
521 Burbrook Pl. (Old East Village)

1.0 km

Powerhouse Brewery
100 Kellogg Ln. (Old East Village)



Other London Breweries

Beerlab!
420 Talbot St Unit 3 (800.0m*)

Toboggan Brewing Co.
585 Richmond St. (1.2km*)

Storm Stayed Brewing Company
169 Wharncliffe Rd S. (3.1km*)

Museum of Ontario Archaeology**
1600 Attawondaron Rd.

Museum London
421 Ridout St N.

Thames Valley Parkway Trail
(Great walking, running, biking trail along the Thames River)

Covent Garden Market
130 King St.
(Check out the Piping Kettle - great soup and sandwiches)

Saga Board Games and Coffee Shop
105 King St.

Tilt Arcade Bar
359 Talbot St.

Rec Room**
1680 Richmond St.

Palasad
777 Adelaide St N.

The Kellogg Factory
100 Kellogg Lane
(Check out the beer factory - it has great food!)

Closest Tim Hortons
380 Wellington St Unit 8 (0.17km*)

Closest Starbucks
601 Richmond St (1.1km*)

*distance from Delta Armouries
**not visible on map

UWO Grad Student Stamp of Approval!

Places to go while you're in town!

Breakfast

Coffee Culture Cafe & Eatery
260 Dundas St
https://coffeeculturecafe.com/menu/

Buzz Bagelz
160 Dundas St
https://www.buzzbagelz.com/

Commonwealth Coffee
478 Richmond St
https://commonwealthcoffee.ca/

Early Bird
355 Talbot St

Happiness
403 Wellington St
https://myhappiness.ca/

Cool Shops

Jonathon Brancroft-Snell Gallery
258 Dundas St
https://www.jonathons.ca/

Attic Books
240 Dundas St
https://atticbooks.ca/

Grooves Records
236 Dundas St
https://groovesrecordstore.com/

Lunch/Dinner

Ale House London
288 Dundas St
https://londonalehouse.com/

FtizRay's Restaurant
110 Dundas St
https://www.fitzrays.com/

The Scot's Corner
268 Dundas St

Zen Gardens
344 Dundas St
https://zengardenson.com/
vegetarian

Milo's Craft Beer Emporium
420 Talbot St
https://pubmilos.com/

The Squire Pub & Grill
109 Dundas St
https://squirepubandgrill.ca/

The Green Window
201 Queens Ave
https://www.thegreenwindow.ca/

Poacher's Arms
171 Queens Ave
https://poachersarms.ca/

If you're feeling fancy!

Che Restobar
225 Dundas St
https://www.cherestobar.ca/

The Tasting Room Bar & Bistro
483 Richmond St
http://www.thetastingroom.ca/

Hunter & Co.
349 Talbot St
https://www.hunterco.ca/

CABA-ACAB presents a

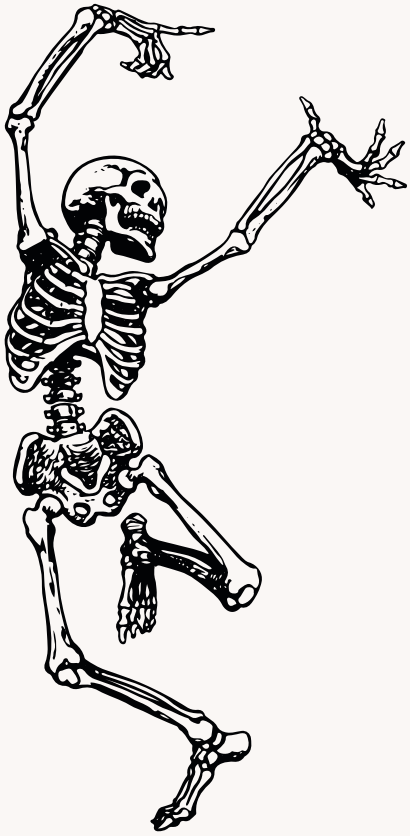
Spooktacular Soirée

THE MORRISSEY HOUSE

361 DUNDAS STREET, LONDON, ON

STARTS AT 7:00PM

31 OCTOBER

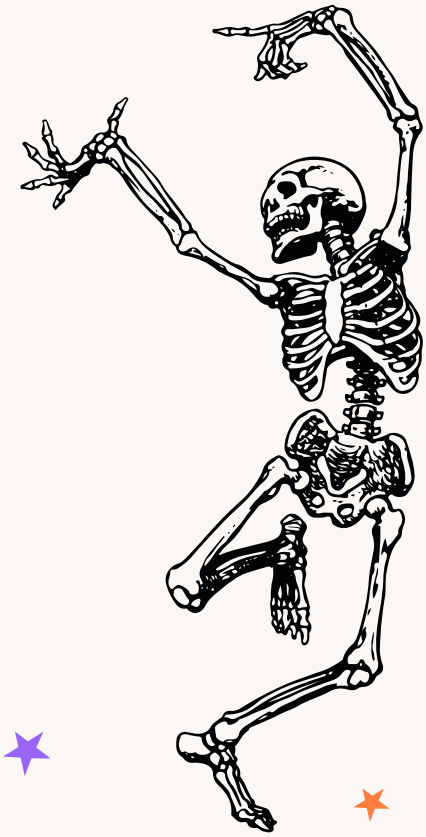


This year CABA-ACAB will be hosting a pub night on October 31st. Appetizers will be provided by the event organizers.

A full kitchen menu will be available for dinner, along with a wide selection of non-alcoholic and alcoholic drinks. Morrissey offers 15+ local craft beers on draught!

Please RSVP by October 24th using the link below

RSVP HERE!



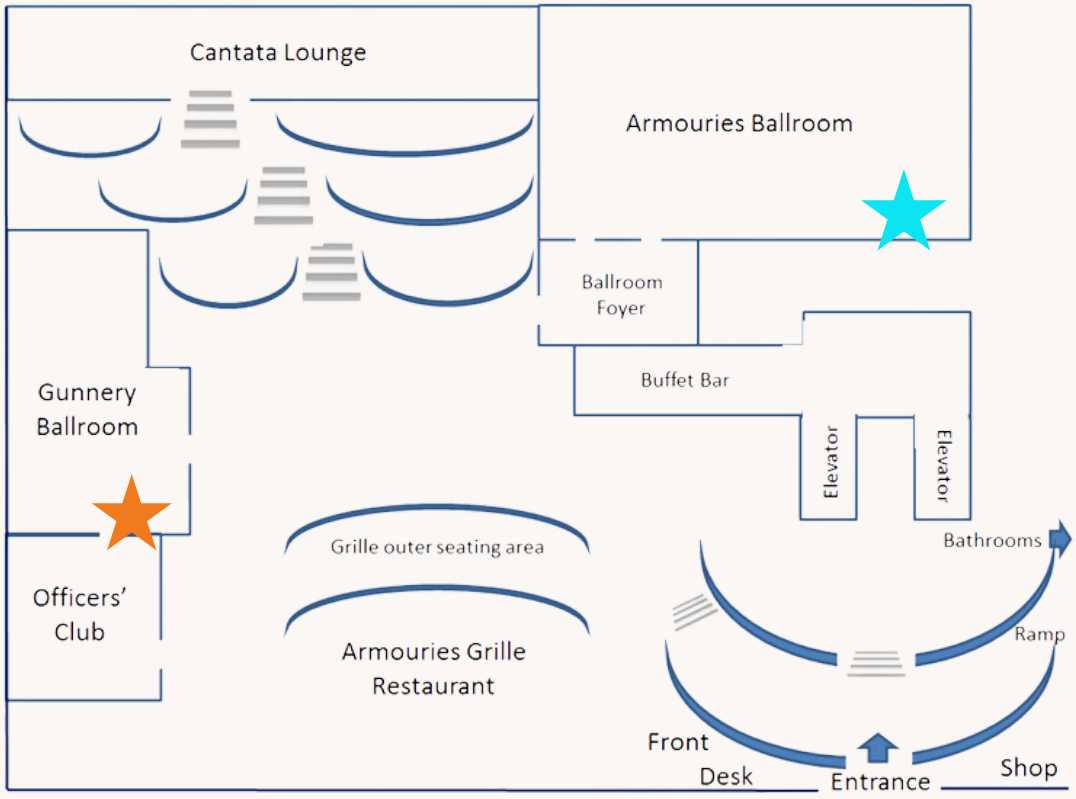
Costumes Encouraged!

some inspiration for your costume... (psst, there is a prize for best costume)

Delta Hotel London Armouries

325 Dundas St
London, ON
N6B 1T9

Floor Plan: Main Floor



CABA ACAB
Forest City 2024

Gunnery Ballroom: Reception, Posters, Business Meeting

Armouries Ballroom: Presentations, Student Luncheon, Banquet

Schedule

Authors bolded have indicated intent to submit for the student prizes

Virtual presenters are highlighted in blue

Wednesday October 30th, 2024

19:00-22:00	Registration and badge pickup
19:00-22:00	Reception – Gunneries Ballroom

Thursday October 31st, 2024

8:00	Poster Setup – Gunnery Ballroom
8:00-16:00	Registration and badge pickup
9:00-9:15	Welcoming Remarks
9:15-10:00	Primatology/Paleoanthropology Session
10:00-10:30	COFFEE BREAK Posters (odd numbers)
10:30-11:45	Morphology/aDNA Session
11:45-13:30	LUNCH
12:00-13:15	Student Luncheon – Armouries Ballroom
13:30-15:00	Biochemical Analysis in Biological Anthropology Symposium
15:00-15:30	COFFEE Posters (even numbers)
15:30-16:45	Human Biology Session
19:00	Spooktacular Soirée (Pub Night) – The Morrissey House

Friday November 1st, 2024

8:30	Poster Setup – Gunnery Ballroom
8:30-16:00	Registration and badge pickup
9:00-10:15	Bioarchaeology pt. 1 Session
10:15-10:45	COFFEE BREAK Posters (even numbers)
10:45-12:15	Doing Good Symposium
12:15-13:45	LUNCH
13:45-15:00	Osteology/Paleopathology
15:00-15:30	COFFEE BREAK Posters (odd numbers)
15:30-16:30	Osteology/Paleopathology cont.
16:30-17:00	Poster take down
17:00-18:00	Business Meeting – Gunneries Ballroom
19:00	Banquet – Armouries Ballroom

Saturday November 2nd, 2024

9:00-10:00	Data Sharing and Open Data Symposium
10:00-10:30	COFFEE BREAK
10:30-11:00	Bioarchaeology pt. 2 Session
11:00-11:30	Closing Remarks

Podium Presenter Schedule

Thursday October 31st, 2024

Time	Titles	Authors
9:00-9:15	WELCOMING REMARKS	
	Session - Primatology/Paleoanthropology (Chair: Michael Schillaci)	
9:15-9:30	Building any primate tooth? Conserved roles of Tp63 and direct targets	Wandzura, A.M. et al
9:30-9:45	Adaptive introgression in modern human circadian rhythm genes	Kendall, C. et al
9:45-10:00	New estimates indicate that males are not larger than females in most mammal species: a critical look at biases in sexual selection research	Tombak, K.J. et al
10:00-10:30	COFFEE BREAK (odd number posters)	
	Session - Morphology/aDNA (Chair: Laure Spake)	
10:30-10:45	Seasonal differences in spider monkey (*Ateles geoffroyi*) subgroup demography and feeding tree use	Bolt, L.M. et al
10:45-11:00	Investigating Unangax̂ Whaling in the Aleutian Islands Using Stable Isotope, ZooMS, and Ancient DNA Techniques	Miller, B. et al
11:00-11:15	Whither typhus: preliminary aDNA results from Kingston General Hospital Cemetery, 1847	Brien, N.E. et al
11:15-11:30	Preliminary results of a 3D geometric morphometric and phylogenetic comparative analysis of shape variation in the catarrhine distal femur	Friesen, S.E. et al
11:30-11:45	Sources of Error in Photo and 3D Surface Scan Measurements of the Rotational Profile of the Lower Limb	**Mees, A. et al**
11:45-13:30	LUNCH	
12:00-13:15	STUDENT LUNCHEON (Armouries Ballroom)	
	Symposium - Biochemical Analysis in Biological Anthropology: Innovations and Applications (Chair: Jocelyn Williams)	
13:30-13:45	The More the Merrier: Expanding the List of Inclusions for Peptide Analysis of Biological Sex in Bioarchaeological Dental Samples	Avery, C.L. et al
13:45-14:00	Stress and the Skeleton: The benefits of a biomolecular approach	**Kaufman, B.L. et al**

14:00-14:15	Variation des isotopes stables de carbone et d'azote fécaux chez les femelles colobes magistrats en fonction du statut reproductif et de la taille du groupe	Larrivaz, M. et al
14:15-14:30	An individual life history approach & synchrotron mapping provides insights into lead exposure in Corinth and Stymphalos, Greece during late antiquity	**Simpson, R.M.L. et al**
14:30-14:45	Dignitaries? Diet and Dinning at Dongola (Tungul)	Stark, R.J.
14:45-15:00	Diet and mobility in the months before death for a Late Intermediate Period burial assemblage at Pachacamac, Peru	Williams, J.S. et al
15:00-15:30	COFFEE BREAK (even number posters)	
	Session - Human Biology (Chair: Jay Stock)	
15:30-15:45	Thermoregulatory-based sexual dimorphism in limb morphology among ultramarathon runners	Hertz, M.P. et al
15:45-16:00	Positive cortisol-testosterone hormonal coupling within populations in Jordan and Argentina	Glass, D. et al
16:00-16:15	“You can’t forget the people still here”: Lessons from post-polio syndrome for the pandemicine	Mant, M. & Islam, A.
16:15-16:30	Rural Experiences of the 1918-19 Influenza Pandemic: How the Past Can Inform the Future	Parish, J.M.
16:30-16:45	Age-related changes in DNA methylation in a sample of elderly Brazilians	**Welsh, H. et al**
19:00	**Spooktacular Soirée (Pub Night) – The Morrissey House**	

Friday November 1st, 2024

Time	Titles	Authors
	Session - Bioarchaeology pt. 1 (Chair: Andrew Nelson)	
9:00-9:15	The Stuttgart Mummy	Andersen, H. et al
9:15-9:30	Integrating Thermography and Ground Penetrating Radar in Southwestern Ontario Grave Identification	Bender, I.S. et al
9:30-9:45	The presence of children in a tholos tomb and adjacent ossuary from the Late Bronze Age on the Island of Kefalonia, Greece	**Johnstone, B. & Albanese, J.**
9:45-10:00	Reviewing structural violence as a framework for understanding violence in bioarchaeological contexts: Violence within the MUNA burial community (Pachacamac, Perú)	Ward, A. et al

10:00-10:15	Optimizing Resolution in 3D Imaging: A comparative study of clinical and micro-CT imaging for visualizing small skeletal elements	**Schneider, M. et al**
10:15-10:45	COFFEE BREAK (even number posters)	
	Symposium - Doing Good: Notes on a Publicly Responsible Biological Anthropology (Chair: Adrianna Wiley)	
10:45-11:00	Stories from Behind the Sternum: An Ethical Framework for a Publicly Engaged Biological Anthropology	**Wiley, A.N. & Cameron, M.E.**
11:00-11:15	Navigating Ethics and Empathy: An Autoethnographic Reflection on Public Responsibility in Biological Anthropology	Lama, C. & Wiley A.N.
11:15-11:30	Public Values at the Core of Conservation: An Anthropological Lens on Ecological Research	**Cosby, A.E.**
11:30-11:45	Genomic research acceptability and bioethical concerns among diverse stakeholders in The Gambia	**Caba et al.**
11:45-12:00	Ethics in Practice: Applying Ethical Guidelines to an Ethics Review Form	Hider, J. et al
12:00-12:15	Sex and Gender: The Importance of Co-Construction	**Chin, C.Z.**
12:15-13:45	LUNCH	
	Session - Osteology/Paleopathology (Chair: Andrea Waters-Rist)	
13:45-14:00	Gastrointestinal distress as a source of infant morbidity and mortality in 18th-19th century Pointe-aux-Trembles, Québec	Holland, S. et al
14:00-14:15	An ‘index of oro-dental disease’: a holistic method for understanding the impacts of different risk factors on oral health in archaeological populations with a case study of tobacco	Inskip, S.A. et al
14:15-14:30	How Do We Talk About Physical Impairment? One Approach to Potential Historic Disability Using a Case Study from Grote Kerk, Alkmaar, the Netherlands (1716-1830 CE)	**Langlois, M.D. & Brickley, M.B**.
14:30-14:45	Association between periodontal disease and mortality in 1918 flu pandemic	Wissler, A.
14:45-15:00	Childhood Health During the Chalcolithic at Seh Gabi, Iran	Woodley, C. et al
15:00-15:30	COFFEE BREAK (odd number posters)	
	Session - Osteology/Paleopathology cont. (Chair: Amanda Wissler)	
15:30-15:45	Assessing the Estimation of Age and Stature from 3D Visual Models	**Sussens, N. & Albanese, J.**

15:45-16:00	Retroauricular activity on the ilium: not “auxiliary” not a “poor” indicator of adult skeletal age	Sierra-Serrano, E. & Albanese, J.
16:00-16:15	Using Parasites to Track Human Migration: New Evidence for Schistosomiasis in Medieval Period Belgium	Ledger, M.L. et al
16:15-16:30	Cœmeteria Olisipponis Memorial Collection and the ethical sourcing skeletal reference collections	Cardoso, H.F.V. & Silva-Bessa, A.
16:30-17:00	Poster take down	
17:00-18:00	**Business Meeting** (Gunneries Ballroom)	
19:00	**Banquet** (Armouries Ballroom)	

Saturday November 2nd, 2024

Time	Titles	Authors
	Symposium - Data Sharing and Open Data in Biological Anthropology (Chairs: Isaac Pratt and Anneliese Eber)	
9:00-9:15	Navigating Challenges & Barriers to Sharing Data in Biological Anthropology	Eber, A. & Pratt, I.
9:15-9:30	The Tri-Agency Research Data Management Policy: implications for research in biological anthropology	Roche, D.G.
9:30-9:45	Human-Fossil-Record.org: an online archive and repository for digital representations of extant and fossil primates	Skinner, M.M.
9:45-10:00	Data Sharing and Paleoanthropology: Examples from Indonesia of the Challenges and Pitfalls	Tocheri, M.W.
10:00-10:30	COFFEE BREAK	
	Session - Bioarchaeology pt. 2 (Chair: Ian Colquhoun)	
10:30-10:45	Unmarked Cemeteries in London, Ontario	D’Alessio, M. et al
10:45-11:00	The Use of Dental Cone Beam CT Scanners to Authenticate Tsantsas (shrunken heads)	Nelson, A.J. et al
11:00-11:30	CLOSING REMARKS	

Poster Presentations

Authors bolded are eligible for the student prizes

Odd #s present at Thursday morning & Friday afternoon coffee breaks
Even #s present at Thursday afternoon & Friday morning coffee breaks

#	Title	Authors
1	Spatial position within trees and mantled howler monkey (*Alouatta palliata*) behaviour	Ali, R.
2	Dental maturation in an Indigenous sample of children from BC, Canada	Alvarez, D.E.M. et al
3	Improving Adult-Age-at-Death Estimation Using Secondary Dentin Accumulation	Amacker, D. et al
4	A Standardized Methodology for Maximum Long Bone Length Measurements of Adults Using Slab Average Projections on Computed Tomography (CT) Scans	**Bidinosti, S.J. et al**
5	How Food Insecurity Among Older Adults Impacts Biological Processes of Aging: An Anthropological Analysis	**Boorman, C.**
6	Analyzing Shape Changes Throughout Male Puberty in the Distal Radial Epiphysis	**Brent, K.E.**
7	Decolonizing the Field of Primate Conservation	Cabral, A. & Rehmani, R.
8	Historical Malaria Mortality in Southern Ontario (1840-1895 CE): An Analysis of Age, Sex, Occupation and Geography	**Cooke, A & Brickley, M.B.**
9	Falls and Brawls: An exploration of fractures at the 18th century Fortress of Louisbourg	Corbett, T. et al
10	Automated Segmentation of bone from matrix for biomechanical analysis of bone: A case study from Uyyun' Al Hammam, Jordan	Dao, E.N. & Stock, J.T.
11	Exploring the shape of the scalp under the hair for female Soldiers	Garlie, T.N. et al
12	Practical Insights into Estimating Sex and Age from Dental Volume Ratios Using Micro-Computed Tomography	Godwin, K.I. & Gamble, J.
13	Exploring the Dietary Habits of Montreal Archaeological Populations (Notre-Dame Cemetery and St-Antoine Cemetery): Identification of Aquatic Resources Using Compound Specific Isotopic Analysis of Amino Acids (CSIA-AA)	Houle, É. et al
14	A test of the reliability of estimating menarcheal status in juvenile remains from dental and skeletal maturation	Ilkhan, T. et al
15	“Malignant melanoma - a one-year wait, a one-second diagnosis”: Walk-in dermatology staff perspectives on care challenges	**Islam, A. et al**
16	Exploring childhood diet and health in Alkmaar, the Netherlands: Preliminary insights from stable isotope analysis of hair	**Lovatt, C. et al**

17	The Use of Thoracic Elements in Bioarchaeological Trauma Studies	**Magalhaes-Filion, M.**
18	The Biocultural approach in Medical Anthropology in Canada: A scoping review	Mian, M. & Tripp, L.
19	Social Differences in the Secular Trend of Height in Portuguese Boys Over the Twentieth Century	Murray, N.J. & Cardoso, H.V.F.
20	Evidence of Skeletal Manifestations of Gender-Affirming Medical Interventions for the Preliminary Identification of Trans Individuals	**Nemett, J.A.S. & Albanese, J.**
21	Diet and activity budget in parenting and non-parenting female mantled howler monkeys (*Alouatta palliata*)	Nie, L.
22	Efficacy of community-derived, plant-based treatment for *Pediculus humanus capitis*, a common childhood condition	Novogradac, C. & Galloway, T.
23	Breathing Biocultural Life into the Archives: Child Morbidity at an 18th-century Rural Voluntary Hospital	**Parry, C. et al**
24	A Universal Design for Learning Osteology: Virtual Reconstructions and 3D Models	Praill, K.S. et al
25	The relationship between social interactions and age in mantled howler monkeys (*Alouatta palliata*)	Qi, K.
26	Diverse Histories, Common Ground: Bioarchaeological Life Histories from Antigua's Royal Navy Cemetery	Ross, J. et al
26	Applications of Dragonfly for Visualizing Features Associated with Cranial Modification in Fardos	Rountree, S. et al
27	Echoes of contamination: Investigating heavy metal exposure through trace element analysis of human teeth from Wadi Faynan 100, Jordan	**Ruddell, K. et al**
28	Byzantine mass graves: A case study of juveniles at Ismenion Hill	Strickland, E. & Liston, M.
29	Adult forensic age estimation from secondary dentine deposition: A test of the pulp/tooth ratio method in a U.S. population	Tamayo, A.S. et al
30	Examining the Influence of Cremation on Macroscopic and Microscopic Bone Structures, and DNA Recovery for Improved Human Identification	**Thibodeau-Cadieux, E. et al**
31	Theorizing Decolonial Approaches to Understanding Biological Affinities: Lessons from Exploring Facial Soft Tissue Thickness Variation in Western Canada	**Tremblay, S.A.**
32	Trauma Pattern Analysis at Early Bronze Age Wadi Faynan 100, Jordan	**Vieira, O. et al**
33	Vertebral Pathology in Mycenean and post-Mycenean Individuals buried in the Athenian Agora, Greece	Weerasinghe, P. et al
34	Applying Bone Densitometry to Commingled Bone Fragment Identification in Forensic Anthropology	Whitelaw, H. & Rogers, T.L.
35	Health and Disease in Byzantine Thebes: A dental analysis of the site of Ismenion Hill	Wood, R.
36	Trauma Analysis and Subsistence Transition on the Eastern Eurasian Steppe	Yang, C. et al

Podium Abstracts

**Presentations in consideration for Oschinsky-McKern Student Award

---

Session - Primatology/Paleoanthropology (Chair: Michael Schillaci)

9:15 | Building any primate tooth? Conserved roles of Tp63 and direct targets

Wandzura, A.M. (1), Good, S.V. (2), Smith, T.D. (3), Appelt, C.M. (1) & Boughner, J.C. (1)
(1) Department of Anatomy, Physiology & Pharmacology, University of Saskatchewan
(2) Department of Biology, University of Winnipeg
(3) School of Physical Therapy, Slippery Rock University, USA

Primate tooth morphology varies across tooth classes, between deciduous/permanent and maxillary/mandibular dentitions, and across species. Yet primate teeth develop via deeply conserved genetic processes, to which the Tp63 transcription factor may be vital. We used open access bioinformatics software tools and protein labeling experiments to test the extent to which Tp63 and three downstream targets, Fermt1, Krt15, Prss8, are expressed in primate tooth organs. We hypothesized that all four genes act in dental epithelium and its derivatives, in upper, lower, deciduous, and permanent teeth. We probed formalin-fixed, sagittally sectioned and slide-mounted head tissues from stillborn or early infant squirrel monkeys (*Saimiri boliviensis*), marmosets (*Callithrix jacchus*), baboons (*Papio anubis*), and tree shrews (*Tupaia tupaia*, primate outgroup). All four genes were expressed in tooth organ tissues, regardless of tooth class or dentition type. We saw the strongest widespread expression of Prss8, Fermt1, and p63 versus fainter localized expression of Krt15. Protein staining was prominent in dental epithelium and derivatives (enamel organ layers, ameloblasts). Some proteins were also seen in mesenchyme-derived developing pulp, dentine and/or surrounding dental follicle tissues. More broadly, using published genomes for these four species and modern humans (*Homo sapiens sapiens*), we used Biomart to identify active (open chromatin) regulatory regions (promoters; enhancers) in relevant tissues/cell types, and looked for experimental evidence that Tp63 binds to these regions using ENCODE data. We then exported the genomic sequences underlying these regulatory regions and assessed the similarity to and cross-species conservation of putative Tp63 binding motifs. We identified predicted Tp63 motifs flanking all four genes, including Tp63, that exhibited 83%-88% sequence conservation across species. Collectively, these analyses suggest that Tp63 and direct targets are fundamental to tooth development across primates regardless of tooth class and dentition type, and that regulatory regions containing Tp63 binding motifs are evolutionarily conserved across major primate groups.

9:30 | Adaptive introgression in modern human circadian rhythm genes

Kendall, C. (1), Nooranikhojasteh, A. (2), Debortoli, G. (3), Cauê Furlan Roberto, V. (4,5), Mendes, M. (4,5), Samson, D. (3,6), Parra, E. (3), Viola, B. (1) & Schillaci, M.A. (7)

(1) Department of Anthropology, University of Toronto
(2) Epigenome Lab, Princess Margaret Cancer Centre, University Health Network, Toronto
(3) Department of Anthropology, University of Toronto Mississauga
(4) The Centre for Applied Genomics, The Hospital for Sick Children, Toronto
(5) Genetics and Genome Biology Program, The Hospital for Sick Children, Toronto
(6) Sleep and Human Evolution Lab, University of Toronto Mississauga
(7) Department of Anthropology, University of Toronto Scarborough

Interbreeding between modern humans and archaic hominins, including Neanderthals and Denisovans, occurred as modern humans migrated outside of Africa. To assess the impact of introgression on regions associated with circadian rhythm and chronotype we explored 76 human populations within genomic regions associated with circadian rhythm and chronotype. We identified 265 segments overlapping genes described as having a circadian rhythm component or contain variants and segments previously identified as being associated with circadian rhythm or chronotype. Within these segments there are 1,729 archaically-derived variants with very high archaic allele frequencies (over 40%) intersecting 303 genes and intergenic segments. Sixteen of these segments show evidence of positive selection. We examined our segments for evidence of a latitudinal cline within 36 core haplotypes, finding no clear latitude gradient, and we also presented the likely archaic donor for each of these haplotypes. Many of the genes in our results are associated with the immune system and blood cell counts. Additionally, many of the variants show significant associations with complex traits and/or gene expression levels (eQTLs). An interesting finding in our results is that archaic alleles are protective against asthma and other allergic diseases, bipolar disease, and schizophrenia. Lastly, genes and markers associated with sleep and chronotype phenotypes along with several adaptively introgressed genes previously related to serotonin were also found, potentially signalling adaptive selection related to seasonal light variation as modern humans migrated into new environments after leaving Africa. Taken together, our results highlight the sometimes complex and unique ways in which admixture with archaic hominins has impacted selection within modern humans.

9:45 | New estimates indicate that males are not larger than females in most mammal species: a critical look at biases in sexual selection research

Tombak, K.J. (1,2), Hex, S.B.S.W. (2) & Rubenstein, D.I. (2)
(1) Department of Anthropology, Purdue University, Stone Hall, West Lafayette, IN, USA
(2) Department of Ecology and Evolutionary Biology, Princeton University, Guyot Hall, Princeton, NJ, USA

Mammals are distinguished by the fact that we lactate - a physiological constraint that is hypothesized to make the level of investment in offspring particularly divergent between the sexes, reproductively-available females particularly scarce, and sexual selection on males particularly strong compared to other vertebrates. This idea has led to the assumption that sexual size dimorphism should be common in mammals, and that males should tend to be larger than females. Despite some contrary evidence, the narrative that larger males are the norm in mammals - upheld since Darwin’s Descent of Man - still dominates today, supported by meta-analyses that use coarse measures of dimorphism and taxonomically-biased sampling. With newly-available datasets and primary sources reporting sex-segregated means and variances in adult body mass, we put this narrative to a more rigorous test. We estimated

statistically-determined rates of sexual size dimorphism in mammals, sampling taxa by their species richness at the family level. Our analyses of wild, non-provisioned populations representing >400 species (and including 50 primate species) indicated that although males tend to be larger than females when dimorphism occurs, males are not larger in most mammal species. Our investigation challenges a common narrative in evolutionary biology, but more interestingly, it uncovered how susceptible scientists can be to accepting unsubstantiated or poorly-substantiated ideas that align with our own (Western) power hierarchies, and suggests a need to revisit other assumptions in sexual selection research.

Session - Morphology/aDNA (Chair: Laure Spake)

10:30 | Seasonal differences in spider monkey (*Ateles geoffroyi*) subgroup demography and feeding tree use

Bolt, L.M. (1, 2), Kaser, F.V.M. (3) & Schreier, A.L. (2,3)
(1) Department of Anthropology, University of Toronto Mississauga
(2) Maderas Rainforest Conservancy, Miami, FL, USA
(3) Department of Biology, Regis University, Denver, CO, USA

Fission-fusion primate species vary subgroup size and composition due to changing ecological conditions that may be caused by seasonality. Across annual cycles, tropical environments experience more rainfall during wet seasons and less during dry seasons. This impacts food availability for primates, with higher-quality dietary resources such as fruit more available during wet seasons. Spider monkeys (*Ateles geoffroyi*) live in fission-fusion societies and prefer to feed on ripe fruit. We therefore predicted that spider monkeys would range in larger subgroups containing more males and females with infants, and feed from larger trees during wet seasons compared to dry seasons. We collected 350h of data on spider monkey subgroups and tree use from 2018-2024 at La Suerte Biological Research Station (LSBRS), a fragmented rainforest in Costa Rica with high spider monkey population density. We recorded monkey subgroup size and composition and measured trees used for feeding. Although overall spider monkey subgroup size did not vary across seasons (4.5 vs. 4.9; p=0.094), more males (1.21 vs. 0.84; p=0.011) and females with infants (0.65 vs. 0.41; p=0.019) were found in subgroups, and feeding trees had larger DBH (65.6cm vs. 53.2cm; p=0.026) during wet seasons compared to dry seasons. Our results largely support findings from other sites, suggesting that spider monkey subgroups can support more males and females with infants during wet seasons, when more energy-rich, preferred dietary resources are available. However, contrary to predictions, overall subgroup size did not vary across seasons, potentially because of ecological factors. LSBRS is a fragmented forest with high population density, meaning that limited space may constrain the ability of spider monkeys to vary their group size, even during conditions of resource scarcity. As spider monkey populations decline worldwide, it is important to better understand the range of factors impacting their behavioral ecology across seasons in disturbed habitats.

10:45 | Investigating Unangax̂ Whaling in the Aleutian Islands Using Stable Isotope, ZooMS, and Ancient DNA Techniques

Miller, B. (1,2), Canessa, E. (1), Spake, L. (1), Hathout, Y. (1), Hanson, D. (3) & Emery, M.V. (1,4)
(1) Binghamton University, Binghamton, New York, USA
(2) University at Buffalo, Amherst, New Yok, USA
(3) University of Alaska Anchorage, Alaska, USA
(4) Arizona State University, Arizona, USA

Zooarchaeological and ethnographic evidence suggests a rich history of whaling among the ancient Unangax̂ of Alaska's Aleutian Islands. However, fragmented cetacean remains in zooarchaeological assemblages make it difficult to assess the diversity of whales that were scavenged and hunted for food, oil, and construction materials. We employed a combination of stable isotope analyses, Zooarchaeology by Mass Spectrometry (ZooMS), and ancient DNA (aDNA) to identify whale species at archaeological sites in the Aleutian Islands. Fourteen bone fragments from Attu Island (n=10) and Chernabura Island (n=4) were pulverized and processed for isotope ratio mass spectrometry, tandem mass spectrometry sequencing of collagens, and next-generation DNA sequencing (NGS) according to standard protocols. Ancient DNA libraries were sequenced on an Illumina MiSeq, then processed using the EAGER (Efficient Ancient Genome Reconstruction) pipeline. Raw Orbitrap LC-MS/MS spectral files were processed using the QuantMS pipeline. Five samples from Attu and Chernabura did not produce peptide sequences, and 7 libraries failed to produce enough DNA (i.e., 1000 reads for ancient DNA authentication via terminal deamination using DamageProfiler. We visualized BLASTn/p alignments using MEGAN6 and determined that a range of whale species were utilized by the Unangax̂. Ancient DNA and ZooMS concordance testing suggests that rorquals (Balaenoptera) and toothed whales (Odontoceti) were primary targets. The stable carbon and nitrogen isotope data also suggests that a wide range of both baleen and toothed whales were scavenged or hunted for food, building materials, and other utilities. Our study highlights the importance of utilizing multiple analytical techniques to obtain taxonomic information from degraded zooarchaeological assemblages. It also highlights the challenges of obtaining ancient DNA from environments with high temperature fluctuations and acidic soils, and the difficulties in deriving taxonomic profiles from shallow NGS shotgun libraries.

11:00 | Whither typhus: preliminary aDNA results from Kingston General Hospital Cemetery, 1847

Brien, N.E. (1), B.-Hardy, M.H. (2) & Poinar, H. (2)
(1) Department of Biology, McMaster University
(2) Department of Anthropology, McMaster University

The year 1847 was one of upheaval - not only was it the worst year to date of the Great Hunger in Ireland (now known as "Black '47"), but at the same time major ports in North America were caught in the grip of an outbreak of epidemic typhus. If Irish immigrants had managed to survive the famine itself and the voyage to North America in one of the "coffin ships", they again faced deadly circumstances. In the newly-incorporated city of Kingston, Ontario, several hundred Irish immigrants succumbed to the outbreak and were buried in the Kingston Hospital Cemetery. Although the historical sources are clear in describing the typhus outbreak, there

are no specific signs of typhus infection that can be gleaned from osteological analysis. Therefore, analysis of ancient DNA (aDNA) from tooth samples of 38 individuals buried in the Kingston Hospital Cemetery was undertaken to identify the pathogens present at time of death, with specific attention to the presence of *Rickettsia prowazekii*, the infectious agent that causes epidemic typhus. We will present the preliminary results of aDNA analysis, including the evidence for pathogen presence of *R. prowazekii*.

11:15 | Preliminary results of a 3D geometric morphometric and phylogenetic comparative analysis of shape variation in the catarrhine distal femur

Friesen, S.E. (1), Conaway, M.A. (1) & Schroeder, L. (1,2)
(1) Department of Anthropology, University of Toronto Mississauga
(2) Human Evolution Research Institute, Department of Anthropology, University of Cape Town, Rondebosch, South Africa

Distal femur morphology in catarrhine primates determines the range of flexion, extension, and rotational movements of the knee during terrestrial and arboreal locomotion. Early hominins likely engaged in a combination of terrestrial bipedalism and tree-climbing. However, interpretations of fossil functional morphology are challenging because variation in the extant catarrhine distal femur is understudied. We present the preliminary results of a 3D geometric morphometric and phylogenetic comparative analysis of the effects of size, substrate, sex, and phylogeny on distal femur shape in a sample of 85 distal femora deriving from Pan, Gorilla, Papio, Colobus, and Macaca. Initially, a principal component analysis was used to visualize shape variation among taxa. Separation between hominids and cercopithecoids occurred on PC1. On PC3, intrageneric differences between *Pan paniscus* and *Pan troglodytes schweinfurthii, Gorilla gorilla* and *Gorilla beringei*, and *Macaca fascicularis* and *Macaca nemestrina* were observed. This separation may reflect intrageneric differences in the frequency of arboreal versus terrestrial locomotion. Generally, *Pan paniscus, Gorilla gorilla,* and *Macaca fascicularis* engage more frequently in locomotion on arboreal substrates than their counterparts. Procrustes ANOVA was performed to further investigate the influence of size, substrate use, sex, and phylogeny on distal femur shape. Distal femur centroid size contributed to 33% of the total variance within the sample ($p=0.0001$), substrate use 10% ($p=0.0001$), sex 2% ($p=0.0028$), and taxonomic group 18% ($p=0.0001$). The results of a phylogenetic generalized least squares analysis showed that size-related shape differences are linked to phylogenetic relationships, as size contributed only 3% ($p=0.5516$) variance when phylogeny was accounted for. Previous work showing that Pan and Gorilla taxa exhibit morphological differences in the lower limb due to intrageneric variation in tree-climbing frequency was supported in this analysis. Increasing sample sizes will help to improve future interpretations of fossil hominin and extant catarrhine distal femur morphology, especially among closely-related taxa.

****11:30 | Sources of Error in Photo and 3D Surface Scan Measurements of the Rotational Profile of the Lower Limb**

Mees, A. (1), Wollmann-Reynolds, J.S. (1), Bence, V. (1) & Cameron, M. (1)
(1) Department of Anthropology, University of Toronto

The rotational profile of the lower limb is comprised of three variables: femoral torsion, tibial torsion, and talar neck angle. These variables have potential to serve as evidence for behavioural patterns in archaeological groups, but currently lack standardized definitions for measurement and present with a great degree of variation among humans. Previous attempts to measure these angles have relied on photographs, however virtual methods, which have become increasingly popular in anthropological research, provide an alternative for measuring the rotational profile. The precision of measurements of the rotational profile taken from photos or scans, as well as how these methods compare to each other, remains to be explored. Here, we examine multiple sources of error in measurements for the rotational profile of the lower limb from the J.C.B Grant Collection at the University of Toronto. Twenty individuals were randomly selected for measurement. Right and left side measurements were taken for femoral torsion, tibial torsion, and talar neck angle using photographic methods and virtual methods with 3D surface scans. Measurements were taken twice by observer 1 and once by observer 2 with at least a week between observations. Percent error was calculated to determine the degree of error in both inter- and intraobserver error tests for photo and scan measurements. Measurement error between photographic and virtual methods was assessed using Pearson's r correlation coefficients.
Inter- and intraobserver error for photo and scan measurements for femoral and tibial torsion were high (90.5%) while talar neck angle measurements presented comparatively lower levels of error (2.47%). Correlation coefficients produced results suggesting higher comparability between photo and scan methods for tibial torsion, and talar neck angle and lower comparability for femoral torsion. Future studies will continue to work on establishing more standardized protocols for measuring femoral torsion, tibial torsion and talar neck angle using virtual methodologies.

Symposium - Biochemical Analysis in Biological Anthropology: Innovations and Applications (Chair: Jocelyn Williams)

13:30 | The More the Merrier: Expanding the List of Inclusions for Peptide Analysis of Biological Sex in Bioarchaeological Dental Samples

Avery, C.L. (1,2), Amaro, A. (3), Campbell, T. (4) & Prowse, T. (3)
(1) Department of Anthropology, University of Toronto Mississauga
(2) Stantec Consulting Ltd., Environmental Services
(3) Department of Anthropology, McMaster University
(4) McMaster University, Centre for Microbial Chemical Biology, Michael G. DeGroote Institute for Infectious Disease Research

Biological sex estimation is often a primary step in osteological analysis, but can be limited when examining pre-pubertal, comingled, or fragmentary osteological remains. Recent application of peptide analysis provides a minimally destructive approach to isolate X- and Y-chromosome linked isoforms of amelogenin, allowing researchers to estimate biological sex from dental enamel. Typically, this approach relies on the isolation and identification of two specific peptide sequences (PSMs): X-linked SIRPPYPSY, and Y-linked SMIRPPY. The challenge with this approach is that, while samples with AMEL-Y are unambiguously male,

samples with no AMEL-Y may be either male false negative samples or female samples. In this study, we investigate an expanded list of X- and Y- linked PSMs to increase certainty in sex estimation in archaeological samples.
Eighty teeth from five Italian sites were sampled for peptides and subjected to up to three rounds of mass spectrometry. In the first round, 38 teeth were analyzed following the standard methodology, targeting only SMIRPPY and SIRPPYPSY. The results demonstrated skewed results with 60.5% of samples identified as female and 10.5% identified as male (29% of the sample was inconclusive).
In the second run, the same 38 teeth and 40 additional teeth (n=78) were run against an expanded list of eight AMEL-X and AMEL-Y linked PSMs. With this approach, 37.2% were identified as female and 38.5% were identified as male (24.3% produced no or inconclusive results). These results suggest that an expanded list of sex-linked PSMs will provide more confident differentiation of males and females in archaeological samples. A final run of a small subset of teeth (n=26) were run against an untargeted list, capturing any sex-linked isoform identified in the sample. The results of these different runs are discussed, and best practices proposed for analyzing peptides to estimate biological sex in archaeological samples.

****13:45 | Stress and the Skeleton: The benefits of a biomolecular approach**

Kaufman, B.L. (1,2) & Scott, A.B. (1)
(1) Department of Anthropology, University of New Brunswick
(2) Department of Human Genetics, McGill University

Bioarchaeologists have studied stress for decades to explore the individual lived experience and/or population experiences of stress, such as famine, violence, disease, or poor living conditions. Historically, stress has been studied through the macroscopic assessment of skeletal lesions that develop in response to a chronic activation of the acute stress response. Despite the common use of these lesions, however, their applicability has several limitations, including, but not limited to, the age of onset, the time necessary to develop, their non-specificity, and the ongoing challenges with intra and inter-observer error of their analysis. In response to these limitations, the molecular analysis of stress has become an important consideration in bioarchaeological research. Molecular analyses involve studying the biochemical messengers that are involved with the acute stress response and preclude the skeletal changes that have traditionally been studied. This study assessed two biomarkers associated with physiological stress, specifically osteocalcin and cortisol. Osteocalcin is a protein hormone intimately linked to the body's metabolism and is stored within the skeleton. Similarly, cortisol is a steroid hormone that acts as the primary messenger that initiates the acute stress response. Using the methods outlined by Scott et al. (2020) and Hughes (2020), osteocalcin concentrations were extracted from 11 parietal samples from the 18th-century Fortress of Louisbourg skeletal collection. Osteocalcin was compared to cortisol concentrations extracted from the same skeletal elements using the zooarchaeological procedures outlined by Charapata (2018). Cortisol was also extracted from hair samples collected from the same 11 individuals to assess concentration patterns across different tissues. While no relationship was present between osteocalcin concentrations and hair cortisol, there was a meaningful statistical link between osteocalcin concentrations and bone cortisol concentrations, suggesting that osteocalcin is an accurate proxy for stress when cortisol cannot be extracted in large enough quantities or bone preservation prevents sampling.

14:00 | Variation des isotopes stables de carbone et d'azote fécaux chez les femelles colobes magistrats en fonction du statut reproductif et de la taille du groupe

Larrivaz, M. (1), Heppell, M. (1), Montel, C. (2) & B'descu, I. (1)
(1) Département d'anthropologie, Université de Montréal
(2) UFR LLSHS, Université Sorbonne Nord, Villetaneuse, France

Les isotopes stables du carbone ($\delta^{13}C$) et de l'azote ($\delta^{15}N$) révèlent des variations dans l'apport alimentaire, y compris l'accès aux hydrates de carbone provenant de différentes plantes ou de différentes parties de la canopée, et l'accès aux protéines, ces dernières étant cruciales pour les femelles primates durant la gestation ou la lactation. Nous avons analysé les variations $\delta^{13}C$ et $\delta^{15}N$ dans 97 fèces de 23 femelles adultes et subadultes de colobes magistrats (*Colobus vellerosus*) de six groupes à la BFMS au Ghana, en fonction du statut reproductif des femelles et de la taille du groupe. L'objectif était de mieux comprendre comment les facteurs sociaux et alimentaires affectent l'effort métabolique des femelles d'une espèce folivore. Les femelles en lactation et en gestation ont montré des valeurs de $\delta^{13}C$ plus négatives (Generalized Estimating Equations, GEE : P = 0,03), peut-être parce qu'elles se nourrissaient généralement plus bas dans la canopée que les autres femelles. Les femelles enceintes ou celles portant un nourrisson ont pu rencontrer des difficultés à grimper plus haut dans les arbres, ce qui peut indiquer un coût potentiel de la gestation et de la lactation sur les habitudes de fourragement. Les femelles vivant en groupes avec un plus grand nombre de femelles semblaient ingérer plus de plantes riches en protéines (GEE : $\delta^{15}N$, P = 0,06 ; %N, P = 0,004). Ce résultat est conforme à l'hypothèse selon laquelle les grands groupes (ou les groupes comptant plus de femelles) peuvent mieux défendre les ressources de qualité supérieure contre les petits groupes, même chez les primates folivores et plus égalitaires. Mots clés: Isotopes stables, fèces, *Colobus vellerosus*, femelles, statut reproducteur, taille du groupe

****14:15 | An individual life history approach & synchrotron mapping provides insights into lead exposure in Corinth and Stymphalos, Greece during late antiquity**

Simpson, R.M.L. (1), Swanston, T. (2,3), Wei, X. (4), Harrison, K.D. (4), Varney, T.L. (5), Cooper, D.M.L. (4), Coulthard, I. (6) & Garvie-Lok, S.J. (1)
(1) Department of Anthropology, University of Alberta
(2) Department of Anthropology, Economics, and Political Science, MacEwan University
(3) Department of Biological Sciences, MacEwan University
(4) Department of Anatomy, Physiology, and Pharmacology, University of Saskatchewan
(5) Department of Anthropology, Lakehead University
(6) Department of Chemistry, University of Western Ontario

We are currently exploring lead (Pb) exposure in two Peloponnesian populations, Corinth and Stymphalos, dating to late antiquity (3rd to 7th c. A.D.) via chemical analysis of human skeletal remains. Evidence from ancient written accounts, archaeological artifacts, and environmental records demonstrates that lead was widely used during the Roman period; however, to date, there has been a lack of research on lead use and exposure in eastern Roman populations. Contrasting lead exposure in urban Corinth and rural Stymphalos allows us to tease apart the relative contribution of urban industrial sources of lead from regional and domestic sources. Lead's affinity for hydroxyapatite means that archaeological skeletal remains serve as biological archives of lifetime lead exposure in the past. Utilizing an intra-individual sampling

approach (one tooth, one to two bone samples) provides insights into shifts in lead exposure across the life course. Here, we present the bulk lead concentrations from enamel and bone samples and contextualize these data with a selection of high-resolution synchrotron X-ray fluorescence images of dental and cortical bone sections obtained at the Canadian Light Source (CLS) BioXAS-Imaging beamline. Results indicate relatively low levels of exposure among both populations, with slightly elevated concentrations among individuals from urban Corinth. Synchrotron imaging demonstrates lead exposure was relatively low-level and consistent throughout life, with isolated cases of biogenic episodic exposure. While it is not the primary focus of the current paper, our preliminary exploration of diagenetic alteration has enabled us to identify postmortem anthropogenic lead contamination and exclude several samples from analysis. Future steps will involve synchrotron imaging and speciation of a larger sample size and assessing additional diagenetic indicators.

14:30 | Dignitaries? Diet and Dinning at Dongola (Tungul)

Stark, R.J. (1,2)
(1) Department of Anthropology, University of Waterloo
(2) Polish Centre of Mediterranean Archaeology, University of Warsaw, Warsaw, Poland

Crypts 1-3 in the Northwest Annex of the monastery on Kom H at Tungul (Old Dongola), the capital of the medieval kingdom of Makuria (ca. 6th c. CE through the 14th c. CE) in what is today Sudan, have been inferred since their initial discovery to be associated with individuals of elevated status. This inference largely derives from the identification of the epitaph of Archbishop Georgios in direct association with one of the crypts, which has been variously interpreted to suggest not only the interment of Georgios within the crypt but also that these crypts may have been used for the burials of bishops, church officials, heads of the monastery, and/or social elites more generally. Yet, no clear evidence beyond the epitaph of Georgios has been identified to date to substantiate or deny these inferences, bringing forth numerous questions about the role of this burial locale in the broader Tungul landscape. This study utilises analyses of carbon and nitrogen isotope values from collagen to assess the nature of dietary variation among n=18/20 individuals interred within Crypts 1-3 at Tungul in relation to inferences about diet within the larger Tungul community and medieval Nubia more broadly. The results of isotope analyses demonstrate a diversity of diets among the individuals interred within Crypts 1-3 on Kom H, with several individuals having diets distinctly different from the overall diets observed among individuals within the adjacent Christian cemetery and other burial contexts thus far analysed at Tungul. Such data bring forth additional questions about the individuals interred in Crypts 1-3 on Kom H in terms of access to foodstuffs and different patterns of consumption, particularly in regard to animal products.

14:45 | Diet and mobility in the months before death for a Late Intermediate Period burial assemblage at Pachacamac, Peru

Williams, J.S. (1), Nelson, A.J. (2), Watson, L. (3), Fuentes, S. (4) & Pozzi-Escot, D. (4)
(1) Department of Anthropology, Trent University,
(2) Department of Anthropology, Western University
(3) Archaeology, University of Wrocław, Poland
(4) Museo Pachacamac, Lurín, Perú

Andean chronology is divided into Horizons and Periods where the former is associated with cultural change and mobility and the latter is associated with limited mobility and continuity. On the central Peruvian coast, the Late Horizon (LH, AD 1470-1532) is associated with Inca imperialism, increased mobility, and political reorganization. The period preceding their rule (Late Intermediate Period (LIP) AD 1000-1470) is generally assumed to be characterized by limited mobility, local political organization, and economic specialization; however, this is based on few sites and limited empirical data. This research utilized a LIP burial assemblage excavated at the monumental administrative and pilgrimage center of Pachacamac to investigate diet, mobility, and regional interactions in the LIP. These data were used to test generalizations about the LIP and situate future research on Inca imperialism in this area. Additionally, these data have implications for the interpretation of Pachacamac as a pilgrimage center.
Hair was opportunistically sampled from 38 LIP mummy bundles; 28 individuals had hair that could be sampled into multiple contiguous segments and analyzed for the stable isotopes of carbon, nitrogen, and sulfur. These data provide information on diet and mobility in the months preceding death. In general, these data are consistent with a coastal origin; however, some individuals have isotope ratios consistent with the adjacent highland areas. These data suggest there was a certain level of regional mobility in the Late Intermediate Period and that Pachacamac was visited by people from outside the immediate area. This finding is somewhat at odds with the material culture at this time on the central coast where funerary rituals, architecture, pottery are predominantly local in style.

Session - Human Biology (Chair: Jay Stock)

15:30 | Thermoregulatory-based sexual dimorphism in limb morphology among ultramarathon runners

Hertz, M.P. (1,2), Longman, D.P. (3), Murray, A. (4), Wells, J.C.K. (5) & Stock, J.T. (1)
(1) Department of Anthropology, Western University
(2) Collaborative Specialization in Musculoskeletal Health Research, Bone and Joint Institute, Western University
(3) School of Sport, Health and Exercise Sciences, Loughborough University
(4) Department of Anthropology, University of Victoria
(5) Childhood Nutrition Research Centre, Population, UCL Great Ormond Street Institute of Child Health

Functional benefits of phenotypic variation, such as body mass, height, hip circumference and limb proportions, have been observed among ultra-endurance athletes. These results are consistent with Bergmann’s and Allen’s rules but suggest that energy expenditure and body composition are crucial components of human thermoregulation. Our previous results suggest that relationships between morphology and performance are stronger in female versus male athletes; possible sex differences may indicate unique energetic constraints of reproduction. Expanding upon anthropometric measurements to include three-dimensional body scanning allows for the computation of limb-specific surface area to volume ratios (SAVRs) of

ultramarathon runners participating in hot and cold race environments and more careful quantification of potential heat exchange due to phenotypic variation. This presentation investigates differences in limb SAVRs derived from 3D body surface scans among male (n=19) and female (n=14) athletes relative to anthropometric variation and race completion. SAVRs correlated with crural indices (CI) in males and females. While female and male body shapes differed between hot and cold race finishers, predominately in the upper limb, females exhibited a higher degree of variation between hot and cold groups, when controlling for age and course elevation gain/loss, compared to males. Furthermore, when examining the correlation between crural index and lower limb SAVRs, females exhibit a significant positive correlation between crural index and lower limb SAVR, consistent with assumptions of Bergmann's and Allen's rules. However, male crural indices demonstrate a negative relationship with leg SAVR, a pattern inconsistent with morphological predictions of these ecogeographic rules. These results highlight the role of sexual dimorphism in morphological adaptation to thermal conditions and strengthen the argument that females' consistent ecogeographical patterning may be a result of unique energetic constraints and resource allocation pathways.

15:45 | Positive cortisol-testosterone hormonal coupling within populations in Jordan and Argentina

Glass, D. (1,2,3), Godwin, J. (2), Koehn, J. (4), Bez, E. (1), Corley, M. (5), Dajani, R. (6), Hadfield, K. (7), Panter-Brick, C. (8), Valeggia, C. (8) & Martin, M (1,2)
(1) Department of Anthropology, University of Washington, Washington, USA
(2) Center for Studies in Demography and Ecology, University of Washington, Washington, USA
(3) Department of Anthropology, University of Toronto St. George
(4) Department of Medicinal Chemistry, University of Washington, Washington, USA
(5) Department of Ecology and Evolutionary Biology, Yale University, Connecticut, USA
(6) Department of Biology and Biotechnology, Hashemite University, Zarqa, Jordan
(7) School of Psychology, Trinity Centre for Global Health, Trinity College Dublin, Dublin, Ireland
(8) Department of Anthropology, Yale University, Connecticut, USA

Puberty is regulated by the hypothalamic-pituitary-adrenal (HPA) and gonadal (HPG) axes. Evolutionary theorists suggest the HPA and HPG co-activate during pubertal development specifically - such that cortisol and testosterone are positively coupled (associated) during puberty and de-coupled post-puberty. While some find positive associations between cortisol-testosterone coupling and pubertal status, there is weaker evidence of an age-related trend and less evidence of hormonal coupling outside Western contexts. We draw from two populations with biomarker data in Argentina and Jordan that have been shaped by socioeconomic and geopolitical marginalization: Indigenous Qom females aged 7-14 (n=46 participants, n = 777 total samples) and Syrian/Jordanian males and females aged 11-19 (n =769) living in Jordan. Qom participants had >1 year of quarterly morning urine samples assayed with commercial kits and in-house assays. Jordanian and Syrian participants had dried blood spots, which were analyzed for free cortisol and testosterone using multiple reaction monitoring mass spectrometry. We used Bayesian hierarchical models and predicted cortisol and testosterone would not couple at pre-pubertal ages, positively couple at pubertal ages, and de-couple post-puberty. We find small, robust positive associations between cortisol

and age on testosterone across ages. For Qom females, coupling increased in magnitude at ages 12-14, suggesting greater post-menarcheal changes. Among Jordanian/Syrian adolescents, coupling was greater for females vs. males at earlier ages compared to later ages (~15-16). We show positive hormonal coupling (but not de-coupling) across adolescence in two global populations. Patterns of hormonal coupling may indicate underlying population differences in pubertal timing.

16:00 | "You can't forget the people still here": Lessons from post-polio syndrome for the pandemicine

Mant, M. (1) & Islam, A. (2)
(1) Department of Anthropology, University of Toronto Mississauga
(2) Department of Anthropology, University of Toronto

We are only beginning to comprehend the long-term health effects of the ongoing SARS-CoV-2 pandemic and the constellation of post-COVID conditions collectively termed 'long COVID'. Little anthropological work has yet been undertaken in Canada to explore the biopsychosocial experiences of people living with acquired disability from infectious disease. This is the first research to engage directly with Canadian individuals who contracted polio regarding their infectious disease experiences in the context of COVID-19. The illness narratives of these voices are an untapped resource in understanding how best to prepare for future parallel health challenges and how to improve patient-practitioner communication today. This pilot project comprised of semi-structured interviews with 61 Canadians who contracted polio between 1941 and 1977. Their varied experiences emphasize that there is no single 'polio story' and that the virus continues to affect biological (i.e., physical health), social (i.e., relationships), and psychological (i.e., coping) aspects of their lives. These experiences are considered within critical disability theory, which scrutinizes the social context that focuses stigma onto and into certain bodies. In this presentation, we will outline the preliminary results of these revelatory conversations, highlighting vaccine hesitancy, healthcare practitioner education, and the challenges of navigating (in)visible disability as key areas of critical inquiry.

16:15 | Rural Experiences of the 1918-19 Influenza Pandemic: How the Past Can Inform the Future

Parish, J.M. (1)
(1) Department of L'nu, Political, and Social Studies, Cape Breton University

Novel infections causing epidemics are no strangers to our health care system. When looking at historical epidemics, we can continue to learn about the ways that infections interacted with the sociocultural determinants of health. It is the nature of a novel infection to disarm many of the modern advances that are made up until the point of its arrival. Then we are left with our earliest lessons learned until a treatment can be devised. This includes the simplest, yet most effective, means of controlling the spread of an infection from person to person that we have all become familiar with social distancing, not aggregating in large crowds, wearing masks, covering sneezes, and washing hands. Even before germ theory was fully developed, these interventions were practiced.
Rural healthcare has become an area of interest in our modern Canadian setting and is of

particular concern within the province of Nova Scotia. The benefits of living within particular population densities are an area of deep intrigue within the health sciences. The health and longevity benefits of aging in place and remaining in one's community of choice for as long as possible are well known. If definitions of rural and urban are robust enough to consider many variables, an argument can be made for the deep historical benefits of rural living. Access to healthcare though can be challenging. This study demonstrates that the relationship to place and accessibility isn't always straightforward. Using the 1918-19 influenza pandemic in Cape Breton Island as an example, the case is made for semi-urban levels of accessibility as the ideal circumstance to insulate against the stresses of an epidemic of a novel infection. Parallels to modern sociocultural determinants are made to demonstrate how the historical record can inform us about our present and future rural health care decisions.

****16:30 | Age-related changes in DNA methylation in a sample of elderly Brazilians**

Welsh, H. (1), Batalha, C.M.P.F. (2), Li, W. (3), Souza-Pinto, N.C. (2), Duarte, Y.A.O. (4,5), Naslavsky, M.S. (6) & Parra EJ (1).
(1) Department of Anthropology, University of Toronto at Mississauga
(2) Department of Biochemistry, University of São Paulo, São Paulo, Brazil
(3) The Centre for Applied Genomics, Hospital for Sick Children, Toronto, Canada
(4) Medical-Surgical Nursing Department, School of Nursing, University of São Paulo, São Paulo, Brazil
(5) Epidemiology Department, Public Health School, University of São Paulo, São Paulo, Brazil
(6) Department of Genetics and Evolutionary Biology, University of São Paulo, São Paulo, Brazil

Age-related changes in DNA methylation (DNAm) play a critical role in regulating gene expression, yet most epigenome-wide association studies have focused on individuals of European descent. This study investigates longitudinal DNAm changes in a cohort of elderly Brazilian participants. DNAm profiles were collected approximately nine years apart from 23 elderly Brazilian individuals using the Illumina EPIC array. A mixed-effects model was employed to examine DNAm changes, with quantitative age as the predictor of interest, to identify age-associated differentially methylated positions (aDMPs). Significant (FDR<0.05) aDMPs were compared to those found in previous studies. Age-associated differentially methylated regions (aDMRs) were identified using DMRcate, and gene ontology (GO) pathway enrichment analyses were performed to explore the functional significance of identified aDMPs and aDMRs. Of the 586,229 autosomal probes analyzed, 2,768 significant (FDR<0.05) aDMPs and 305 aDMRs were identified. Notably, 1,297 aDMPs were not previously identified in earlier studies, 77.4% of which were exclusive to the EPIC array. The aDMPs and aDMRs exhibited age-related hypermethylation within CpG islands and promoter regions of the genome, while hypomethylation predominantly occurred in interCGI regions, intergenic regions, and introns. The GO enrichment analyses revealed several neurological and cognition-related pathways enriched for hypermethylated CpG islands, many of which were mapped near transcription start sites and first exon regions. In conclusion, this longitudinal study identified 1,297 novel aDMPs in a sample of elderly Brazilians. Most of the novel CpGs were found to be on the new EPIC array, suggesting that more age-related studies using the EPIC array are required to validate these CpGs. The GO pathway enrichment analyses identified age-related enrichment of several gene sets related to cognitive and physical decline, offering insights into how the

accumulation of epigenetic changes may contribute to neurodegeneration and age-related disease in elderly populations.

Session - Bioarchaeology pt. 1 (Chair: Andrew Nelson)

9:00 | The Stuttgart Mummy

Andersen, H. (1), Nelson, A. (1) & Riberdy, A (1)
(1) Department of Anthropology, Western University

In pre-Hispanic Peru, deceased individuals were commonly wrapped in textiles and buried in the sand, leading to mummification. These mummy bundles, known as fardos, typically included individuals buried with artifacts. Fardos held a great cultural importance in ancient Peruvian mortuary customs and played a key role in cultural rejuvenation. There is stylistic and type variation in these bundles both within and between cultural periods. While research into these variations is limited, a variant known as falsa cabeza has been documented. This variation is characterized by a “false head” on top of the bundle. Typically, the false head is created with wadded or folded textiles placed on top of the bundle. These bundles are also typically more elaborate than ‘regular’ fardos. Falsa Cabezas are differentiated from other masked fardos because of their likeness to reality and unfantastic appearance compared to other warrior or funerary masks (Eeckhout 2020).
I present a case study of a unique type of falsa cabeza currently residing in The Linden Stuttgart Museum in Germany. This case study is in collaboration with the Linden Stuttgart Museum and part of the “Mummies as Microcosms” project (Nelson et al. 2021). For this presentation, I will refer to this fardo as the Stuttgart mummy. Little is known about this mummy, other than its origins in Peru. The purpose of this case study is to reveal more information about the individual and its mortuary context. This mummy is unique in its excellent preservation and rare burial positioning. Unlike most falsa cabeza mummies, the false head was created over the individual’s real head. This was revealed using radiological imaging. This positioning is very different from most other falsa cabezas and has not been recognized in current literature. This paper explores the potential social and physical implications of this unique burial context.

9:15 | Integrating Thermography and Ground Penetrating Radar in Southwestern Ontario Grave Identification

Bender, I.S. (1), Eastaugh, E. (1) & Hodgetts, L. (1)
(1) Department of Anthropology, Western University

Remote sensing is being used in the growing number of searches for unmarked graves at residential school sites across Canada. Research is needed to fully understand the limitations and potential of a range of techniques for this purpose. While Ground Penetrating Radar (GPR) is the most widely used technique, positively identifying grave locations in GPR data can be difficult depending on a variety of factors including local geology, land use history and vegetation. This study explores the effectiveness of digital thermography in increasing

confidence in grave identification. Because it would be inappropriate to use a sensitive residential school site for experimental tests, we used a historic settler cemetery, the Ingersoll Rural Cemetery in Southwestern Ontario, Canada, as a test site. We collected data from a drone-mounted thermal sensor and GPR over three test areas with marked graves dating from 1883 to 2017. Preliminary findings indicate that combining thermal imaging with GPR enhances confidence in identifying burials.

****9:30 | The presence of children in a tholos tomb and adjacent ossuary from the Late Bronze Age on the Island of Kefalonia, Greece**

Johnstone, B. (1) & Albanese, J (1)
(1) Department of Integrative Biology, University of Windsor

At a Late Bronze Age site at Tzannata on the Island of Kefalonia, Greece, human remains were recovered from a unique combination of tombs during excavations in the mid-1990s. A systematic analysis of the osteological remains has been ongoing since 2015. In this paper we present the results of age distribution with a focus on the remains of juveniles. The commingled and fragmentary nature of remains confounds the construction of a detailed demographic profile for each tomb. However, it was possible to assess the range of ages of children present in each tomb using three overlapping approaches. First, long bones with unfused epiphyses were seriated based on size. Second, the stages of growth and development were assessed using partially fused epiphyses. Third, the development of the deciduous and permanent dentition was assessed. There is clear skeletal evidence that individuals ranging in age from infants to young adults were included in both tombs. There is evidence that, at least in these monumental tombs, mortuary practices were similar for children and adults regardless of age and gender. The analysis of the juvenile remains is complementary to other archaeological approaches for reconstructing the concept of childhood and the roles of children during the Late Bronze Age.

9:45 | Reviewing structural violence as a framework for understanding violence in bioarchaeological contexts: Violence within the MUNA burial community (Pachacamac, Perú)

Ward, A. (1), Nakahodo, N. (1), Watson Jiménez, L. (2), Fuentes, S. (3), Pozzi-Escot, D. (3), Williams, J. (4) & Nelson, A. (1)
(1) Department of Anthropology, Western University
(2) Archaeology, University of Wrocław, Poland
(3) Museo Pachacamac, Lurín, Perú
(4) Department of Anthropology, Trent University

Between June 2022 and April 2023 fifty-nine individuals from the MUNA cemetery (Pachacamac, Perú) were examined using structural violence (SV) as an analytical framework. The aim of the study was to understand the nature of harms experienced by the community during the Late Intermediate Period and Late Horizon (c. 1100-1532 CE), and to explore the efficaciousness of SV as an analytical framework in non-Euroamerican and less rigidly hierarchical contexts. Comparisons of the rates of nonspecific stress markers, presence of osteoarthritis, and trauma based on age, sex and, and/or status indicated that while most of the

community were not subject to violence, some nonadults buried in the cemetery did experience SV. Analysis indicated that SV did not operate via differences in resource distribution or labour intensity, but via participation in tinku and human sacrifice, i.e., ritualised physical violence. The process of using SV as an analytical framework highlighted its strengths, including the nuance SV adds to understanding mechanisms of domination and control, but also exposed it weaknesses. In particular, the analysis indicated that SV requires a higher degree of socio-political complexity to form and underscored that the framework is most effective when rich, detailed contextual evidence is available. In all, this means that SV will be more suited for understanding violence within communities with more complicated hierarchies and rich contextual evidence.

****10:00 | Optimizing Resolution in 3D Imaging: A comparative study of clinical and micro-CT imaging for visualizing small skeletal elements.**

Schneider, M. (1,2), Reznikov, N. (3) & Nelson, A. (1)
(1) Department of Anthropology, Western University
(2) Collaborative Specialization in Musculoskeletal Health Research, Bone and Joint Institute, Western University
(3) Department of Bioengineering, McGill University

The resolution in 3D imaging is critical to data quality and usability. Higher-resolution scans, like micro-CTs, produce large datasets that require more storage and processing, while clinical CT scanners are more accessible with smaller, manageable datasets. However, clinical CT scans typically have a voxel size of 500-600 µm, limiting the ability to visualize features smaller than ~0.5 mm. Balancing resolution with resources and technology available is a key consideration and challenge when applying 3D imaging techniques in bioarchaeology. This project compares clinical and micro-CT imaging for visualizing avian bones in a mummified falcon from ancient Egypt. The falcon was scanned with an Aquilion ONE/Prism clinical CT scanner (500 µm) and a Nikon Metris XT H 225 ST micro-CT scanner at resolutions of 110 µm, 50 µm, and 25 µm. Skeletal visualization at varying resolutions was assessed through two methods: (1) visual analysis of the 3D segmented images and (2) comparison of cranial and long bone measurements using linear regressions and error calculations. Clinical CT scans did not produce usable 3D images of small skeletal elements (such as sesamoid bones in the wing) due to lower spatial resolution; however, cranial and long bone measurements were accurate compared to the low-resolution micro-CT scan ($R^2 = 0.9963$; <5% error). Low-resolution micro-CT (110 µm) effectively captured small skeletal features However, a higher resolution (25 µm) scan was needed for very fine details such as the bony structure in the bird's eye. While high-resolution micro-CT scans are ideal for detailed 3D reconstructions, lower-resolution micro-CTs and clinical CTs still provide valuable insights regarding small skeletal structures. This project helps inform future researchers regarding the choice of resolution and scanner required to visualize key skeletal elements in varying contexts.

Symposium - Doing Good: Notes on a Publicly Responsible Biological Anthropology (Chair: Adrianna Wiley)

****10:45 | Stories from Behind the Sternum: An Ethical Framework for a Publicly Engaged Biological Anthropology**

Wiley, A.N. (1) & Cameron, M.C. (1)
(1) Department of Anthropology, University of Toronto

Research does not end with dissemination. We have an ethical responsibility for the stories we tell and the narrative 'afterlives' we leave behind. To build a publicly engaged biological anthropology that does not stand on the crumbling foundations of anthropology's beginnings - reproducing the harms against Black, Indigenous, and other marginalized communities - a strong ethical framework must be constructed from the outset. While several existing ethical frameworks are commonly applied to the treatment of subjects relevant to biological anthropology including bioethics, anthropological ethics, and scientific ethics, I argue that dissemination might be most conscientious and effective when practiced through the frameworks of Borofsky's public anthropology and Supernant and Lyon's 'heart-centred practice'. 'Heart-centred practice' begins with teaching and learning relationships, and extends through fieldwork, collaborations, and publishing, inherently considering the 'afterlives' of our work in ethical decision making. In this presentation I ask how we might create a publicly engaged biological anthropology that is at once accessible, likeable, and ethically responsible? When combined with Boroskfy's call to 'do good' by creating a more informed public, I find the four primary elements that inform a heart-centred practice - rigor, care, relationality, and emotion - provide a solid framework for addressing this question. Ultimately, I argue that an ethical public anthropology is one that is conscious of the ways one's representations may be misused by nefarious parties and deliberate about its sociopolitical message. Further, an ethical public anthropology mitigates potential harms by taking a humanizing narrative aesthetic form, cultivating empathy in its audiences.

11:00 | Navigating Ethics and Empathy: An Autoethnographic Reflection on Public Responsibility in Biological Anthropology

Lama, C. (1) & Wiley A.N. (2)
(1) Department of Anthropology, Western University
(2) Department of Anthropology, University of Toronto

The act of sharing academic information with the public begins with an individual collecting data - the researcher themselves. Thus, in order to be publicly responsible, one must first be personally responsible and further, one must understand the nuances of representing the individuals with whom one works. While currently accepted ethical frameworks may support using a particular person in data collection, one's own moral feelings may challenge this structure. In this presentation, I use an autoethnographical lens to look at my personal experience in working with sensitive material. I begin by outlining my work, then emphasize the moral complexities I faced, and explore how they intersect with current ethics in biological

anthropology. I then identify how self-reflection allowed me to alleviate said profound feelings, and suggest an empathy-based structure as an ethical framework. This structure is grounded in theory of mind, allowing the researcher to acknowledge that the individuals they are working with had their own feelings, and behaviours, and in turn, use that to inspire empathy. This autoethnography identifies the crucial factor in the public responsibility of biological anthropology as the researcher themselves. How we as anthropologists represent those we study matters, especially in the public eye, and this representation begins in how we personally view such individuals. Achieving a positive lens through which to view these persons and the subsequent data that is being collected from them is initiated by feelings of empathy. While this has its own faults and shortcomings, I believe it is a valuable route to take in exploring how to be publicly responsible in the realm of biological anthropology. I challenge those who attend this symposium and presentation to self-reflect and wonder - how would you wish to be represented?

****11:15 | Public Values at the Core of Conservation: An Anthropological Lens on Ecological Research**

Cosby, A.E. (1)
(1) Department of Integrative Biology, University of Guelph

Ethical study of the natural world frequently involves collaboration with the public. In ecology, where virtually all research sites overlap with ancestral territories, government jurisdictions, or even someone's backyard, the ability to confidently articulate our research in a way that resonates with our audience is an essential skill. However, this engagement is not without its challenges. As we extend our research beyond the confines of academia, we encounter diverse stakeholders, each with their own unique perspectives, interests, and biases. The complexity of these relationships requires us to be acutely aware of the ethical and moral implications of our work. Public engagement in ecology and conservation is not merely about disseminating information, but fostering dynamic, multi-way dialogues where members of the public are active participants. When we empower communities to learn, contribute, and take ownership of ecological projects, we create a sense of responsibility that extends beyond the research itself. By including multiple stakeholders and rights holders, we ensure our work not only informs but also inspires action, builds trust, and cultivates knowledgeable stewards who advocate for the natural world. This collaborative approach becomes crucial when our research intersects with sensitive issues such as land rights, species conservation, and environmental justice. The way in which we present our findings can have profound and far-reaching consequences, influencing everything from public policy to academic-community relations. It is our responsibility to ensure our work is communicated with nuance and care, avoiding oversimplification or misrepresentation that could lead to unintended harm. By prioritizing public involvement, we can democratize knowledge, advancing scientific understanding while creating lasting, positive impacts that benefit society and promote ecological and conservation efforts.

****11:30 | Genomic research acceptability and bioethical concerns among diverse stakeholders in The Gambia**

Caba, S. (1), Morren, K. (2), Ceesay, A. (3), Emery, M. (1), Cerami, C. (3,4) & Spake, L. (1)

(1) Department of Anthropology, Binghamton University (SUNY)
(2) Division of Human Nutrition and Epidemiology, Wageningen University
(3) Nutrition and Planetary Health Theme, Medical Research Council Unit The Gambia at LSHTM
(4) Faculty of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine

Genomic research has advanced rapidly, enhancing understanding of disease and public health. However, Western populations are over-represented in genomic research. Recent efforts to correct this bias have led to attempts to rapidly expand data collection in under-represented areas, such as West Africa. In these communities, practical challenges including funding, infrastructure, limited genomic knowledge, language barriers, ethical concerns, and mistrust hinder participation and informed consent in studies. This study explores the perspectives of different stakeholders on ethical and practical challenges to human genomic research to develop more sustainable, context-sensitive research designs for genomic research.
In-depth interviews and focus group discussions were conducted with experts, nurses, fieldworkers, and laypeople in The Gambia. Using semi-structured guides, we asked participants about the perspectives on ethical issues around genomic research including informed consent, factors influencing willingness to participate, and general obstacles to ethical research. The discussions were recorded, translated, transcribed, and analyzed qualitative thematic analysis in NVivo 13.
The level of knowledge regarding genomic research varied widely among the laypeople, fieldworkers, and nurses, with most having limited understanding of genetics and little awareness of the purposes of genomic research. These challenges have implications for ensuring that participants can provide informed consent. A multitude of factors potentially hampering genomic research were identified, including lack of education, trust in key players, data and specimen protection, and perceived benefit to self and others. Expert interviews helped to contextualize these issues and provide potential solutions to these obstacles. Conversations with stakeholders at all levels revealed that signed informed consent documents are not enough to ensure participants in genomic studies fully comprehend implications of the research. These findings suggest informed consent processes require revision in education-limited contexts. Recommendations from this study can be used to facilitate meaningful community participation in these conversations.

11:45 | Ethics in Practice: Applying Ethical Guidelines to an Ethics Review Form

Hider, J. (1), Sidhu, R. (2), Parry, A. (3) & Poinar, H.N. (1,2)
(1) Department of Anthropology, McMaster University
(2) Department of Biology, McMaster University
(3) McMaster's Black Student Success Centre, McMaster University

Ancient DNA (aDNA) research, like contemporary genetics, faces ongoing ethical issues and controversies concerning transparency, consent, and unanticipated risk to descendant communities. Recently, there has been a greater push for accountability and shifting ethical practices in aDNA research. Part of making research more ethical is being more cognizant of the colonial nature of the field and working to be more inclusive of descendant and underrepresented communities. This will increase engagement with people who have

traditionally been excluded from research, improve research by including different perspectives and ways of knowing, and lead to research that benefits diverse groups. Inclusion is one part of making aDNA research more ethical, along with reflecting on the scientific feasibility of the research, plans for reporting results, and plans for data and sample stewardship.
To encourage ethical aDNA research, research institutions need to modify current ethical guidelines and ethics review processes to identify considerations prior to the destructive analysis of human remains. Current guidelines and ethics review forms are typically designed for the analysis of modern human subjects (living or recently deceased) do not address do not address the unique nature of archaeological samples or inferences about living individuals and groups that can come from the data. In this paper, we incorporate aDNA ethical guidelines into McMaster's institutional ethics review form. The proposed changes require accountability of researchers to the people being studied, those connected to them, and to the scientific community. We encourage all institutions to revisit their current guidelines and ethics review forms to ensure that these guidelines and review processes ensure the ethical study of both modern and ancient human subjects.

****12:00 | Sex and Gender: The Importance of Co-Construction**

Chin, C.Z. (1)
(1) Department of Anthropology, University of Toronto

In their recently-published book, *Who's Afraid of Gender?*, philosopher and gender theorist Judith Butler explains how gender has become phantasmic in social discourse, and reasserts the importance of co-construction. Opponents of "gender ideology" have discursively connected the topic to existing social issues and framed it as an existential threat, endeavours which are blatant misdirections intended to justify simultaneous erasure and hatred towards diversity in sex and gender. This talk, focusing on the US and Canada, will explore how this issue is related to biological anthropology, as it is rooted in a false disparity between biological versus cultural processes. This fundamental misunderstanding manifests in active hostility towards any hint of diversity. Yet sex - purportedly the biological - and gender - purportedly the cultural - are far more intertwined than previously understood. As anthropologists, we are uniquely positioned to change the public narrative using our inherently interdisciplinary work. A co-constructive approach to sex and gender leaves space to explore potential interactions without needlessly assigning biological and cultural descriptors. Such an approach emphasizes that each category gains meaning and influence through their interactions with other factors, ultimately fostering greater theoretical complexity. Future research should include an understanding of co-construction and, specifically, how sex and gender are inextricable from one another, thus facilitating more effective science communication from a public-facing anthropology.

Session - Osteology/Paleopathology (Chairs: Andrea Waters-Rist and Amanda Wissler)

13:45 | Gastrointestinal distress as a source of infant morbidity and mortality in 18th-19th century Pointe-aux-Trembles, Québec

Holland, S. (1,2), Ribot, I. (3), Longstaffe, F.J. (4) & Waters-Rist A (1,2)
(1) Department of Anthropology, Western University
(2) Collaborative Specialization in Musculoskeletal Health Research, Bone and Joint Institute, Western University
(3) Département d'Anthropologie, Université de Montréal
(4) Department of Earth Sciences, Western University

Diarrheal disease is among the leading causes of death in children less than 5 years of age, and historical sources suggest gastrointestinal (GI) distress (repeated vomiting, diarrhea) was a common cause of infant mortality in 19th century Montréal, Québec. This study considers GI upset as a source of infant stress and mortality in 18th-19th century Pointe-aux-Trembles, a rural community near Montréal. To support the historical evidence of GI upset in this region, 25 infants (≤ 3 years of age) with archaeological dental remains were evaluated for evidence of dental lesions and selected for stable carbon and nitrogen isotope analysis of incremental dentine. 54% of individuals display caries on the anterior dentition, and 44% have enamel hypoplasia and/or isotopic evidence of nutritional/physiological stress. These results could be consistent with frequent bouts of vomiting and subsequent malnutrition. Burial records from the cemetery were examined for individuals ≤ 3 years of age at death (n = 1934) to create mortality profiles and contextualize the dental and isotopic data. Summer burials (June-August; 709/1934, 37%) occurred twice as often as winter burials (December-February; 305/1934, 16%), which may be related to increased bacterial growth and contamination of water sources in the summer months. Altogether, these data suggest GI distress was a common ailment in infants from this community. This may have been related to early complementary feeding (< 6 months of age; observed in at least 32% of infants), which can increase an infants' risk of diarrheal morbidity and mortality. This study improves our understanding of the lives of infants in 18th-19th century rural Montréal and demonstrates the value of incorporating archival and historical literature into bioarchaeological analyses.

14:00 | An 'index of oro-dental disease': a holistic method for understanding the impacts of different risk factors on oral health in archaeological populations with a case study of tobacco

Inskip, S.A. (1), Davies-Barrett, A.M (1), Jakubovics, N. (2) & Holliday, R. (2).
(1) School of Archaeology and Ancient History, University of Leicester, Leicester, UK
(2) School of Dental Sciences, Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne

Understanding the impacts of risk factors on oral health in archaeological populations has always been accompanied by issues of preservation and comparability between multiple

different oro-dental diseases. Influenced by clinical approaches, we produced a formula that can be applied to combined true prevalence data for caries, periapical lesions, periodontal disease, and antemortem tooth loss, with double weighting given to the latter. This produces a composite 'Index of Oro-dental Disease' (IOD) score per individual, which also accounts for missing data. We applied this formula to oro-dental disease datasets from modern clinical (n=6206) and 'mock' archaeological (clinical data with missing values inserted) British populations, and datasets from 537 individuals from five post-medieval British and Dutch archaeological populations (British; Barton-upon-Humber, St James's Gardens Burial Ground. Dutch; Middenbeemster, Zwolle and Arnham). Patterns in mean IOD values within different variable groups were consistent across all data sets. IOD scores significantly increased with age, were higher in archaeological females, and in tobacco-consumer groups, although the impact varied by community. This demonstrates that the IOD method is a useful approach for understanding the impact of different risk factors on oral health in the past, whilst also accounting for missing data and increasing comparability between groups/individuals. This method can be applied retrospectively to pre-existing true prevalence data and can be adapted to allow for differences in original data collection. This method has only been applied to five archaeological populations and under/over-inflation of mean scores may occur in smaller sample sizes. Thus, application of the method still needs to be tested on a greater range of population groups and different risk factors for oro-dental disease.

****14:15 | How Do We Talk About Physical Impairment? One Approach to Potential Historic Disability Using a Case Study from Grote Kerk, Alkmaar, the Netherlands (1716-1830 CE)**

Langlois, M.D. (1) & Brickley, M.B. (1)
(1) Department of Anthropology, McMaster University

Disability is part of the human experience, yet disability and the lived experiences of people with physical impairments have only recently come to the attention of bioarchaeologists. Disability is a social construct; how we define disability is culturally specific, resulting in difficulties in identifying disability in archaeological contexts. However, by defining disability as the inability to function within expected lifeways, it is possible to examine the effects of physical impairment on lived experiences and explore the construction of disability in historic contexts. Using a biocultural lens and robust cultural contextualization, this study examines the ability to function of three middle- to upper-class adult females from Grote Kerk, Alkmaar, the Netherlands (1716-1830 CE), with diagnoses of permanent, bilateral developmental dysplasia of the hip (DDH). DDH results from an abnormality in the hip joint's size, shape, or orientation and, when untreated, leads to loss of normal joint function and deteriorating quality of life. DDH likely resulted in functional impairment in the form of limited mobility and potential pain for all three individuals analyzed in the present study, but there is little evidence to support disablement in the form of social restrictions as they were likely able to fulfill their expected roles as mid- to upper-class women. While there are aspects of disability that cannot be recovered archaeologically, our findings add to the ongoing discussion of historic disability by examining the intersection of socioeconomic status, sex, and physical impairment in a post-medieval Dutch population and depicts how the study of disability can be approached in bioarchaeological contexts.

14:30 | Association between periodontal disease and mortality in 1918 flu pandemic

Wissler, A. (1)
(1) Department of Anthropology, McMaster University

Periodontal disease - a bacterial infection that destroys gum tissue, the periodontal ligament, and alveolar bone - is caused by a dysregulation of inflammatory processes. It is linked to other chronic inflammatory conditions such as inflammatory bowel disease and rheumatoid arthritis. Clinical studies suggest that periodontal disease may have been a potential risk factor for increased mortality from COVID. Previous research on the 1918 flu presents conflicting evidence that “healthy” young adults as well as those with evidence of prior skeletal frailty were more likely to die from the flu. This research aims to provide a potential explanation for this conflicting evidence by testing whether periodontal disease was a risk factor for increased risk of death during the 1918 influenza pandemic. A total of 241 individuals from the Hamann-Todd Documented Skeletal Collection who died between 1915 and 1919 were examined for skeletal indicators of periodontal disease. The data were analyzed using survival and hazards analysis. The results show that people with advanced periodontal disease had significantly lower survivorship during the 1918 flu compared to previous years. Furthermore, individuals with high periodontal disease scores were over 2 times more likely to die during the flu compared to individuals with no periodontal disease.

14:45 | Childhood Health During the Chalcolithic at Seh Gabi, Iran

Woodley, C. (1), Merrett, D. (1) & Varney, T. (1)
(1) Department of Anthropology, Lakehead University

The relationship between subsistence strategies and marginal environments can impact human health outcomes. This study was designed to determine whether the subadult population at the Chalcolithic site of Seh Gabi, Iran experienced vitamin C and D deficiencies (VCD and VDD respectively) throughout its period of occupancy. The residents of Seh Gabi lived in a marginal environment which, when coupled with the intensification of agricultural practices and the use of animal husbandry, could have left the population susceptible to the type of dietary stressors associated with both VCD and VDD. The radiographs and excavated remains of 32 subadults were macroscopically assessed for any morphology beyond the range of normal. Lesions and abnormal morphology were then contextualized within the environmental and cultural information available. Differential diagnoses specific to metabolic bone disease (MBD) were made based on whether skeletal indicators present on individuals aligned with lesions associated with any MBD. These differential diagnoses revealed that 53.1% of the population suffered from VCD, or a comorbid condition of both VCD and VDD. Interpretations of adult health were also made based off these subadult health findings. Given the environmental context and subsistence strategy used by this population, along with the differential diagnoses, vitamin C and D deficiencies were likely experienced.

****15:30 | Assessing the Estimation of Age and Stature from 3D Visual Models**

Sussens, N. (1) & Albanese, J. (1)
(1) Department of Integrative Biology, University of Windsor

Recently, laser scanners have been endorsed for their ability to accurately record 3D information about crime scenes. Before being applied to forensic cases, the accuracy and reproducibility of these scans must be examined. Since the measurements required for anthropological examination must be very precise, anthropology is a useful tool to show the accuracy of laser scans. In this study, a mock crime scene was set out with a high-quality cast of a juvenile skeletal model placed in approximately anatomical position. A Faro Freestyle handheld scanner was employed to gather data of the skeleton and surrounding area. Measurements of the cast were taken first by hand, and then from the scans twice on separate occasions. Reproducibility and accuracy of the two 3D sets was examined. Age and stature estimation were both attempted, utilizing the scanner measurements and the ones collected by hand. Results showed that while the scanner measurements were useful for age estimation, as discrepancies between the actual measurements and the scanned ones were less than 1 year apart, the measurements were less useful for stature estimation. The scans showed inconsistent errors with stature estimation, either underestimating or overestimating the measurements without enough of a discernable pattern to account for the errors.

15:45 | Retroauricular activity on the ilium: not “auxiliary” not a “poor” indicator of adult skeletal age

Sierra-Serrano, E. (1) & Albanese, J. (1,2)
(1) Department of Archaeology, Simon Fraser University
(2) Department of Integrative Biology, University of Windsor

The auricular surface of the ilium is often well preserved in skeletal remains, and morphological changes in this area are valuable for adult age estimation. Lovejoy et al.1985 first proposed a systematic method that included retroauricular activity only as an auxiliary age indicator. Almost two decades later, Buckberry & Chamberlain 2002 critiqued this approach, and their changes excluded retroauricular activity as a poor age estimator. In this paper, we present some results of a re-examination of retroauricular activity as an age indicator using a refined description of this variation.
The study analyzed a sample of 131 individuals from the Terry Collection at the Smithsonian Museum of Natural History, selected through stratified sampling to ensure balanced representation by sex and age. The age range for the sample is 22 to 101 years old with a mean age 51.2. Pearson’s correlation coefficient for retroauricular activity and age at death was 0.491. A series of binary logistic regressions were applied across three age groups: younger (20-39 years old), middle (40-65), and older adults (66+). Using this probabilistic approach, it was possible to allocate an individual to an age group in 58% to 80% of cases. Intra-observer error was assessed using a subsample of 30 individuals, aged 23 to 97. Results provided an average agreement of 88% across two blind tests and a Cohen’s kappa of 0.77, indicating substantial agreement.
These results suggest a strong correlation of retroauricular activity with age, and that this feature can be a reliable indicator for age estimation for cases involving a broad range of ages at death.

16:00 | Using Parasites to Track Human Migration: New Evidence for Schistosomiasis in Medieval Period Belgium

Ledger, M.L. (1,2), Poulain, M. (3) & Deforce, K. (3,4)
(1) Department of Pathology and Molecular Medicine, McMaster University
(2) McMaster Ancient DNA Centre, McMaster University
(3) Department of Archaeology, Ghent University, Belgium
(4) Royal Belgian Institute of Natural Sciences, Belgium

The complexity of parasite transmission dynamics with certain species having restricted ecological niches dependent on environmental conditions and appropriate intermediate hosts makes parasites useful probes for human migration. As the research contributions of palaeoparasitologists grow, we have increasing examples of the potential for using parasites to track human migration in the past. We discuss this literature and present new evidence for migration between Africa and Belgium in the medieval period using palaeoparasitological analysis of latrine contents from a 15th - 16th c. latrine located in the Spanish nation house in Bruges, Belgium. Microscopic analysis of latrine sediment identified an egg from *Schistosoma mansoni*, which causes intestinal schistosomiasis. Today, the vast majority of *S. mansoni* infections occur in Sub-Saharan Africa, with additional pockets of endemicity in the Arabian peninsula and South America. There is archaeological evidence for schistosomiasis in the past, however, nearly all of these cases come from endemic areas in Egypt and Nubia. The new data presented here and analyzed within the historical and archaeological context of the latrine provide direct evidence for the movement of *S. mansoni* outside of its endemic area coinciding with the start of the Atlantic slave trade. This infection may have occurred in a merchant who acquired the parasite during trade voyages to Africa or in an individual from Africa who migrated to Bruges. This evidence in conjunction with a review of other studies in paleoparasitology exemplifies the use of palaeoparasitology as a contributor to studies on human migration. Future studies designed with incorporation of historical and archaeological data will be useful in tracking human migration in the past.

16:15 | Cœmeteria Olisipponis Memorial Collection and the ethical sourcing skeletal reference collections

Cardoso H.F.V. (1) & Silva-Bessa A. (1)
(1) Department of Archaeology, Simon Fraser University

The retention of human remains for research and teaching purposes is a controversial and contentious matter in North America mainly due to the colonial legacy of archaeology and anatomy. To address that history, academic institutions are repatriating and returning ancestral remains to communities, as well as restricting or rethinking access to human remains for research and teaching purposes. In countries like Portugal, academia and museums rely on contemporary cemetery legislation and ongoing relationships with municipalities and their cemeteries to source unclaimed human remains for skeletal reference collections. Such practice has provided a unique opportunity to establish a new osteological collection of sixty named individuals, currently cared for at the Department of Archaeology at Simon Fraser University. This paper provides a brief overview of the project entitled “Commemorative and communitive-based curation and study of unclaimed human remains. Engaging local and non-local communities in osteological and mortuary research” of which the collection is fundamental

component. With the support of the Municipality of Lisbon, the Portuguese National Institute of Legal Medicine and Forensic Sciences, and the Portuguese National Council of Ethics for the Life Sciences, this project rests on the principles of community participation, community capacity building, ethical and responsible conduct, and engagement in a spirit of reciprocity for knowledge mobilization and training initiatives that will address a set of distinct goals. While there is a firm belief that archaeological and anatomical specimens that were collected without consent of own, family or community should be repatriated or destroyed, the issue of consent is also historically and culturally situated. It is hoped that this project will develop a trans-national perspective on the retention of human remains for research and teaching and demonstrate how their value and that of cemetery practices, can transcend local boundaries. The project is meant to provide a thought-provoking example of community identity building, and how wide apart communities can be connected to contribute to the resolution of past and current social and scholarly challenges.

Symposium - Data Sharing and Open Data in Biological Anthropology (Chairs: Isaac Pratt and Anneliese Eber)

9:00 | Navigating Challenges & Barriers to Sharing Data in Biological Anthropology

Eber, A. (1,2) & Pratt, I. (3)
(1) University of Waterloo Library, University of Waterloo
(2) Department of Anthropology, Lakehead University
(3) McMaster University Library, McMaster University

As academia continues to deepen its dependence on digital methods and data, scholars are seeing increasing calls for transparency in their research practices, including depositing and sharing data. Recognition of the benefits for collaboration and access fuel desire for open data by researchers, while concerns about reproducibility and replicability incentivize journals and funders to require data sharing. In Canada, researchers now face requirements for grants from the Tri-Agencies and increasing requirements from journals and international funders. Though these policies are well-intended and necessary in the modern research environment, ease of compliance and expertise across disciplines varies.
This talk will discuss how to navigate issues such as finding places to deposit and share data, ambiguity in data ownership and copyright, data sovereignty questions, concerns about ethics and human remains, and the challenges of working with a large variety of complex data. Because of the field's position at the intersection of social sciences, health sciences, humanities, and natural sciences, biological anthropologists often face higher barriers to sharing and accessing data than researchers in other fields. While these barriers are not unique to anthropology individually, together they create situations that are difficult to navigate. In response to the growing demands on researchers in these areas, research institutions now provide Research Data Management supports and experts who can assist researchers in finding solutions to their specific challenges.

9:15 | The Tri-Agency Research Data Management Policy: implications for research in biological anthropology

Roche, D.G. (1)
(1) Social Sciences and Humanities Research Council of Canada

The Tri-Agency Research Data Management (RDM) Policy was adopted in 2021 to support research excellence by promoting sound research data management and stewardship practices; ensure that research is performed ethically and makes good use of public funds; experiments and studies are replicable; and research results are as accessible as possible. This talk will provide an overview of the Tri-Agency RDM Policy and an update on the implementation of its three pillars: institutional research data management strategies; data management plans; and data deposit. Special consideration will be given to the implementation of the data deposit requirement; challenges and mechanisms for depositing and sharing sensitive data; Indigenous data sovereignty; and the implications of the Tri-Agency RDM Policy for research in biological anthropology.
The speaker, Dom Roche, is a Senior Policy Advisor at the Social Sciences and Humanities Research Council of Canada (SSHRC). Dom has a background in environmental science and meta-research on open science practices, specifically on data sharing. His work on transparency, reproducibility, and research integrity has led to over 30 publications in peer-reviewed journals. In 2021, he co-founded the Society for Open, Reliable, and Transparent Ecology and Evolutionary biology (www.sortee.org), a grass-roots initiative to promote open science practices in ecology, evolution and related disciplines. At SSHRC, Dom chairs the Tri-Agency Research Data Management Working Group and leads the implementation of the data deposit requirement for the three agencies.

9:30 | Human-Fossil-Record.org: an online archive and repository for digital representations of extant and fossil primates

Skinner, M.M. (1)
(1) Max Planck Institute for Evolutionary Anthropology, Germany

The Human-Fossil-Record.org is a European Research Council-funded website whose goal is to provide visual information about the bones and teeth that have been discovered and identified as belonging on the human branch of the tree of life. It also includes samples of extant primates and recent modern humans. This visual information can include digital photographs, surface models, and/or microtomographic scans and it currently includes collections from 19 international institutions including major hominin hypodigms from National Museums of Kenya and the Ditsong National Museum of Natural History. It also provides a public repository for scientific data linked to publications. In this talk I will discuss the challenges I experienced in creating this archive in relation to issues of copyright, control of digital data, curation and dissemination of large datasets, and whether digital representations of fossils should be sold for scientific purposes. I will also highlight how it was used during COVID to facilitate remote learning and areas of future expansion.

9:45 | Data Sharing and Paleoanthropology: Examples from Indonesia of the Challenges and Pitfalls

Tocheri, M.W. (1,2,3)
(1) Department of Anthropology, Lakehead University
(2) Human Origins Program, Department of Anthropology, National Museum of Natural History, Smithsonian Institution, USA
(3) Australian Research Council Centre of Excellence for Australian Biodiversity and Heritage, University of Wollongong, Australia

Rapid growth of data sharing and other open access initiatives during the past two decades have transformed the landscape of paleoanthropology. Plans for data sharing are now required for most major grant applications and there is often an expectation among funding agencies, universities, and professional colleagues that data be shared as quickly and as widely as possible. In this presentation, I will discuss the challenges and pitfalls of data sharing in paleoanthropology with specific examples from Indonesia, where I have regularly conducted fieldwork for the past 15 years. There are multiple imbalances that exist between Indonesia and nations like Canada, including but not limited to education, economics, and research power. At present, data sharing policies and initiatives are almost entirely developed by nations and scholars from the West, and unfortunately but perhaps not surprisingly, these continue to contribute to rather than rectify such imbalances. Solving such complex issues will likely take decades and require significant investment in Indonesia from Western nations if the goal is truly open science for all rather than only some.

Session - Bioarchaeology pt. 2 (Chair: Ian Colquhoun)

10:30 | Unmarked Cemeteries in London, Ontario

D'Alessio, M. (1), Bishop, K.G. (1) & Martelle, H. (1)
(1) TMHC Inc., London, Ontario

Join us on a tour around London, Ontario as we discuss the risk for unmarked cemeteries within the forest city. An unmarked cemetery is land used as a place for burials which is no longer discernible by signs, tombstones, or markers. The unintentional destruction of unmarked cemeteries, during a time of rapid urban growth over the past 150 years, is an ongoing concern for the redevelopment of urban centres around the province. In London, evidence of displaced human remains or exposed burials has prompted targeted research into unmarked cemeteries for the past number of decades. We revisit previous findings and shed new light on the current risk for unmarked burials in two urban areas in the city. Using historical research, archaeological findings, and reports of human remains discoveries, we examine the current conditions around the former St. Paul's Anglican Cemetery, Wesleyan Methodist Cemetery, St. Lawrence Roman Catholic Cemetery, and the 1854 Cholera Hospital Burial grounds. The potential discovery of residual human remains and intact graves related to historically relocated cemeteries is a significant planning concern as aging infrastructure is replaced and urban redevelopment projects are proposed. Cultural resource management plays a key role in

planning for the investigation of these areas prior to, and during, ground disturbance activities to ensure that burials and their remnants are identified, documented, and relocated for proper burial elsewhere.

11:00 | The Use of Dental Cone Beam CT Scanners to Authenticate Tsantsas (shrunken heads)

Nelson, A.J. (1), Ordoñez, M.P. (2), Poeta, L. (1) & Cobos, S (3).
(1) Department of Anthropology, Western University
(2) Colegio de Ciencias Sociales y Humanidades, Universidad San Fransisco de Quito, Quito, Ecuador
(3) Schulich School of Medicine and Dentistry, Western University

In 2022 we published a paper comparing the use of micro-CT and clinical CT scanning to assess the authenticity of a tsantsa (shrunken head) from Northern Peru. We concluded that clinical CT scans did not have sufficient resolution to identify the key features chat characterize authentic tsantsas. While this is an important conclusion, it is unfortunately, not broadly useful, as very few researchers who are interested in tsantsas have access to a micro-CT scanner. Indeed, to the best of our knowledge, there is no micro-CT scanner in Ecuador, the country of origin of most tsantsas. Thus, we have been exploring the use of dental cone beam CT (CBCT) scanners for the analysis of tsantsas, as these scanners can achieve resolutions between the micro-CT and clinical CT scanners, but are much more widely available, including in Ecuador. In this presentation, we report on the scans of 6 tsantsas using CBCTs. CBCTs have unique imaging characteristics due to their optimization for visualizing bones and teeth, which affect the ability of CBCTs to visualize some features of interest. However, the resolution is sufficient to allow the visualization of others. We will report on our efforts to maximize the utility of these scans.

This work is being done in collaboration with the Shuar, the descendant group of the Indigenous individuals who made the tsantsas.

POSTER ABSTRACTS

**Presentations in consideration for Davidson Black Student Award

Spatial position within trees and mantled howler monkey (Alouatta palliata) behaviour

Ali, R. (1,2)
(1) University of Toronto Mississauga
(2) Maderas Rainforest Conservancy

Spatial position within a tree influences the behaviour of arboreal primates, with different areas within the tree canopy and branches offering different resources. This impacts animal behaviour, with certain activities performed more often in different canopy and branch areas. In this study, I investigated how mantled howler monkey (*Alouatta palliata*) behaviour relates to positioning in tree canopy and branches. I hypothesized that monkey behaviors would vary based on tree position, with monkeys spending a greater percentage of overall activity budgets in high canopy compared to low canopy due to increased food resources and decreased competition. I also predicted monkeys would spend a greater percentage of activity budgets for travelling and feeding when in the halves of branches distal to the trunk (distal branches) compared to proximal branches. Distal branches likely have more food available and provide easier travel access to other trees compared to proximal branches. I collected 25 hours of data on howler monkeys in July 2024 at La Suerte Biological Research Station in Costa Rica, with points taken each 2min during 30min focal samples on individual monkeys. My results supported my predictions. Monkeys spent the majority (85% vs. 15%) of activity budgets in the high canopy compared to the low canopy, and spent a greater percentage of activity budgets feeding (11.4% vs. 3.6%) and resting (39.6% vs. 28.3%) in distal branches compared to proximal branches. Monkeys may prefer the high canopy due to better access to food and easier travel routes being available while minimizing competition with other species. My findings align with other studies, suggesting that howler monkeys prefer higher tree levels and distal branch placement for resting and feeding. My research contributes to our understanding of how spatial position impacts primate behavior and can inform conservation strategies by highlighting key habitat preferences for howler monkeys.

Dental maturation in an Indigenous sample of children from BC, Canada

Alvarez, D.E.M. (1), Yu, C. (2), Richman, J. (3) & Cardoso, H.F.V. (1)
(1) Archaeology, Simon Fraser University
(2) Child's Play Pediatric Dentistry, 7150 200th St #220 Langley City
(3) Oral Health Sciences, University of British Columbia

Many studies have argued for regional-, population- or ethnic-specific differences in dental maturation that reflect genetic variation. More recently, studies have suggested that there are no consistent differences across populations when socioeconomic conditions are controlled for, and a relationship between obesity/overweight and dental maturation has been shown. Currently, no dental maturation studies have been carried out using a BC Canadian Indigenous sample. This study investigates population variation in dental maturation by examining orthopantomograms of children from two samples of children between the ages of 6 to12 years of age. One sample is derived from the Pediatric Dental Group in Vancouver, BC (115 girls and 105 boys), and is comprised of children of diverse backgrounds. The second is derived from Cedar Coast Dental in Terrace, BC (94 girls and 102 boys) and only includes children from local Indigenous communities. Seven mandibular teeth on the left side were assigned a maturity score using the Demirjian scoring scheme. Binary logistical regression was used to estimate the median age of attainment for each tooth by stage and to examine whether any samples and sex differences can be detected in the samples. Significant differences were seen, mostly notably in the later stages (G and H), but not consistently for all teeth and stages. The Indigenous sample demonstrated advanced dental maturation, with girls also being more advanced. Results support the notion that there may be population-based variation in dental maturation, but the source of that variation is still uncertain. The Vancouver sample includes children of middle to high socioeconomic status, while the Indigenous sample is from a lower socioeconomic segment. Canadian surveys report high prevalence of overweight/obesity in the region where the Indigenous sample originates from. This suggests that the accelerated rate of dental maturation in Indigenous children may be due to factors associated with overweight/obesity.

Improving Adult-Age-at-Death Estimation Using Secondary Dentin Accumulation

Amacker, D. (1), Waters-Rist, A. (1) & Nelson, A. (1)
(1) Department of Anthropology, Western University

Identity reconstruction is at the core of biological anthropology, archaeology, and forensics, however, traditional skeletal methods for adult age-at-death estimation are imprecise, especially if the remains are incomplete or poorly preserved. This study investigates a new, non-destructive method for age-at-death estimation based on secondary dentin (SD) which has been suggested to grow at a consistent rate after tooth eruption. Canines from 19th century Dutch individuals with archivally known age-at-death have been micro-CT-scanned and segmented using Dragonfly software to assess the correlation between age and SD accumulation, as well as sex-specific variability and the effect of attrition on SD formation. Preliminary research conducted on a limited subset of the data shows correlation ($r^2 = 0.61$) between age estimated via SD analysis and actual age-at-death; the regression formula developed from this limited preliminary sample accurately predicts age-at-death within ~5 years. This regression formula will be supplemented with a greater dataset throughout the project, and the correlation will be reassessed to include the effects of sex and attrition. Research on

this method is critical as it is non-destructive, utilizes highly accurate micro-CT scans, and requires only a single tooth as opposed to other forms of adult age-at-death estimation.

****A Standardized Methodology for Maximum Long Bone Length Measurements of Adults Using Slab Average Projections on Computed Tomography (CT) Scans**

Bidinosti, S.J. (1), Nelson, A.J. (1), Poeta, L. (1), Motley, J. (1) & Sinclair, B. (2)
(1) Department of Anthropology, Western University
(2) Robarts Research Institute, Western University

While the established standard literature guides estimations of age, biological sex, and stature on skeletonized material, a gap exists in adapting these methods to the 3D realm of computed tomography (CT) scans. The measurement of long bones has proved useful in estimates of stature, biological sex, as well as activity patterns, key elements of an osteobiography. Traditional osteometric methods require the use of an osteometric board or callipers. However, if the individual under study is a mummy, the bones must be analyzed using CT scans for which alternate standards of measurements must be developed. Many studies estimate length on a single CT slice view of a long bone, but the morphology of long bones, especially the femur and humerus, is complex enough that a single slice may not capture the maximum length in a way that is homologous to the traditional osteometric standard. A method to capture measurements of nonadult long bones in CT scans using slab maximum intensity projections has been successfully tested. However, the morphology of adult long bones is much more complex. This research presents a standardized methodology for measuring the maximum length of adult long bones on CT scans, by using a slab technique. This research has been conducted by CT scanning the long bones of the Odd Fellows skeletal collection located at Western University. The Dragonfly 3D World software platform for scientific image processing was used to visualize and conduct the measurements on the scans. Measurements were performed on the CT scans before the bones were physically measured in order to avoid biasing the results. Preliminary results of this study demonstrate a very high level of accuracy and repeatability of this methodology.

****How Food Insecurity Among Older Adults Impacts Biological Processes of Aging: An Anthropological Analysis**

Boorman, C. (1)
(1) Department of Anthropology, McMaster University

Aging, in one way or another, is a universal experience. As humans age, three primary factors of life are impacted; these are known as processes of aging and consist of biological, social, and psychological aspects. Such processes are impacted by various factors and lived experiences, making aging a unique yet global experience.

Specifically, experiencing food insecurity plays a role in a person's natural aging process, particularly impacting their biological aging. Older individuals experience physical aging through cellular damage that happens naturally over time, which is further negatively impacted when living in a food insecure environment. With Canada's aging population, seniors have shown an increasing need for food banks, indicating a necessary call for action. This research explores issues of food insecurity in relation to physical aging, by recognizing food insecure older adults as an understudied population, which causes further harm to such groups. Through conducting a literature review with a focus on anthropological perspectives, this research investigates that living in a food insecure environment negatively impacts older individuals and their natural process of biological aging. Through understanding levels of physical frailty such as exhaustion, unintentional weight loss, and increased weakness, this project concludes that food insecurity plays a role in the physical aging and lives of older adults. With recognizing potential solutions and challenges when addressing food insecurity in older adults, it is evident that measures must be implemented to protect such vulnerable populations from experiencing food insecurity and its effects.
Keywords: Biological aging, food insecurity, frailty, processes of aging, aging population.

****Analyzing Shape Changes Throughout Male Puberty in the Distal Radial Epiphysis**

Brent, K.E. (1,2)
(1) Department of Anthropology, Western University
(2) School of Biomedical Engineering, Western University

Age estimation is a critical element of the osteobiography in biological anthropology. Currently, the normative forensic procedure for estimating age based on the nonadult skeleton relies on the analyses of dental development and long bone epiphyseal fusion, the latter of which may be focused on the left wrist. Despite evident shape change at the epiphyses throughout development, there has yet to be quantification of shape change throughout growth and development at the distal radial epiphysis, a key site for age estimation. This paper serves to apply geometric morphometrics, a technique that has previously been applied to other skeletal elements for the purposes of age estimation, to evaluate whether quantifying shape change during male adolescence at the distal radial epiphysis may be applicable to age estimation. This study employed thirty-three left wrist x-rays approximately evenly representative of males aged 13 through 19, which were subsequently subject to a geometric morphometric analysis, including a principal component analysis, and appropriate statistical analyses. Ultimately, this study found that although there is significant shape difference ($p=0.011$) at the first shape-based principal component between individuals who are 13 and 19 years old (i.e. at the polar ends of the sample), there is a high degree of shape overlap between individuals aged 14 through 18 that impedes the applicability of this methodology for age estimation. Further research should expand upon this pilot study to ensure that the findings hold true with a larger sample size.

Decolonizing the Field of Primate Conservation

Cabral, A. (1) & Rehmani, R. (1)
(1) Department of Anthropology, University of Toronto Mississauga

The access to scientific opportunities in primate-site countries continues to be shaped by colonial practices and systematic exploitation. This perpetuates specific biases that influence the research we conduct (Benzanson 2019; Blair, 2019; Hobaiter et al. 2021). There are many threats that are imposed onto primates and conservation efforts that differ widely depending on location, power, and influence (Lanjouw, 2021). Therefore, it is crucial to reflect on the usage of privileged Western worldviews by decolonizing primatology for more equitable and sustainable research (Blair 2019).
This presentation outlines a research project examining obstacles imposed by colonial narratives on primate conservation. The discussion involved perspectives from a variety of scholars, such as Benzanson et al. (2022), who highlight the critical role of global north populations in primate conservation issues. In this study, Dr. Travis Steffens, University of Guelph, Dr. Laura Bolt, University of Toronto Mississauga and Dr. V who wished to remain autonomous were interviewed in a semi-structured format to contribute their knowledge and experience to the ongoing debate of conservation within the field of primatology.
Given the numerous ways in which conservation efforts are and could be handled, the results suggest a call for a multi-disciplinary approach to not only preserve conservation regions but alter the socioeconomic and political worldview of exploitation and trade. Without understanding of the beliefs, culture and livelihoods of the indigenous people, and without taking into consideration limits to the opportunities available to them. It is essential that we reflect on the ownership of knowledge and how we conduct research to pave a way for a holistic future of diversity and inclusivity.

**Historical Malaria Mortality in Southern Ontario (1840-1895 CE): An Analysis of Age, Sex, Occupation and Geography

Cooke, A. (1) & Brickley, M.B. (1)
(1) Department of Anthropology, McMaster University

Although unheard of today, outside of imported cases from tropical and sub-tropical regions, malaria (*Plasmodium vivax*) was considered endemic to southern Ontario in the 19th century. Despite its significant impact on the health of early colonists malaria has largely been a forgotten disease in Canadian medical history. This study examines malaria-related mortality in southern Ontario (1840-1895 CE), exploring variations by age, sex, occupation, and geographic location. Data was collected for N=840 individuals through official death certificates (1869-1895), Anglican burial records (1841-1895), and burial records from cemeteries in Hamilton and Toronto (both 1850-1895), with data collection ongoing. Preliminary findings show an almost equal sex distribution (52% female, 48% male) and highlight that children under five account for 23% of malaria deaths, demonstrating that this age bracket was disproportionately affected. Linear

regression was applied to explore the potential relationship between sex and age at death, with no statistically significant findings ($p = 0.4616$). However, females aged 20-29 demonstrated higher mortality during their peak childbearing years, suggesting that sex-related mortality patterns may still emerge in age-specific cohorts. These findings align with modern malaria mortality trends, particularly in the vulnerability of children and pregnant individuals. Occupationally, farmers and their families show elevated mortality rates while geographically, the clustering of malaria deaths near the Great Lakes and swampy regions suggests a strong link between environmental factors and disease transmission. By examining historical mortality patterns, this research deepens our understanding of malaria's socioeconomic and environmental determinants in 19th-century Ontario. It contributes to paleopathology literature by contextualizing disease prevalence and mortality within broader population health and environmental shifts during early settlement. Ongoing analysis will further explore socioeconomic and environmental factors, enhancing the understanding of malaria's historical impact. This study provides critical insights into the intersection of disease, occupation, and geography, advancing methodologies in paleopathology and historical epidemiology.

Falls and Brawls: An exploration of fractures at the 18th century Fortress of Louisbourg

Corbett, T. (1), Scott, A.B. (1) & Nelson, A.J. (2)
(1) Department of Anthropology, University of New Brunswick
(2) Department of Anthropology, Western University

The bioarcheological study of fractures can provide valuable insight related to many aspects of the lived experience in past populations, from violence to changing social roles. As the investigation of fractures in bioarchaeology has developed, many studies have begun to combine both macroscopic and microscopic approaches to create a more holistic understanding of how and why fractures occurred. In this study, individuals from the Fortress of Louisbourg skeletal collection were macroscopically evaluated to examine fracture prevalence within this 18th century population. Additionally, this study also explored the utility of micro-computed tomography (micro-CT) to assist with the assessment of fracture healing in a bioarchaeological context. Thirty-two individuals (1 female, 26 males, 5 indeterminate) were assessed ranging in age between 12 and 60 years at the time of death. A total of 52 fractures across eight individuals were identified in all major regions of the body, including the thorax and appendages. A subsample of 31 rib fractures was also assessed using micro-CT imaging with fracture healing scored using the method outlined by Viero and colleagues (2021). There was no significant difference between macroscopic and micro-CT healing scores; however, using micro-CT imaging made it easier to differentiate distinct traumatic events. At Louisbourg, there were many fracture risks related to unsafe working conditions, arduous occupations, and the urban environment. The breadth of fractures identified in this sample suggests that these injuries had a significant impact on the lived experience of those living at Louisbourg, such as loss of mobility, development of secondary health conditions, inability to perform occupational tasks, and even death. Overall, this multifaceted

approach contributes to a more robust understanding of traumatic injuries in 18th century Atlantic Canada.

Automated Segmentation of bone from matrix for biomechanical analysis of bone: A case study from Uyyun' Al Hammam, Jordan

Dao, E.T. (1) & Stock, J.T. (1)
(1) Department of Anthropology, Western University

Skeletal remains from Uyyun' Al Hammam in Jordan include fragmentary remains of 16 human burials dated to approximately 16,000 years before the present. Skeletal elements are highly fragmented and are covered with hardened calcium carbonate and an adhering matrix that limits the capacity to analyze the remains. This study tests the efficacy of the use of microCT scanning and virtual segmentation for cleaning and preparation of archaeological bone for analysis using machine learning. We provide preliminary results on research to: a) test if the identification and segmentation of calcium carbonate and matrix from bone is possible; b) develop and implement a machine-learning model that utilizes a learning algorithm to automate segmentation and be used to identify calcium carbonate and matrix of bone microCT scans; c) extracting volumes of interest (VOI) of virtually segmented trabecular bone for further analysis, and d) compare the use of Bone J and the Dragonfly integrated Bone Analysis function to conduct morphometric properties of trabecular bone. The results indicate that it is possible to create a machine-learning model that can automate segmentation and be used for efficient 'virtual' cleaning and segmentation of calcium carbonate and matrix of the microCT scan, and that model can then be applied to other microCT scans with only minor additional training and validation to speed up the 'virtual' cleaning and segmentation process. This segmentation of bone can facilitate both virtual reconstruction or further morphometric analyses of fossil material. With an effective machine-learning model to automate segmentation, it is possible to calculate biomechanical properties of the skeletal bone such as trabecular thickness, degree of anisotropy, total volume, bone volume function, and trabecular separation, utilizing ORS Dragonfly Bone Analysis and Bone-J programming.

Exploring the shape of the scalp under the hair for female Soldiers

Garlie, T.N. (1), Choi-Rokas, H.E. (1), Li, P. (1), Robin L. Carufel, R.L. (1) & Mitchel, K.B. (1)
(1) DEVCOM Soldier Center, Natick Massachusetts

The development of protective head-borne equipment to protect Soldiers requires accurate modeling of the head and face. Modelling of the Soldier head has a long history in the United States Army dating back to 1945 where head models were developed using critical facial measurements, but scalp shape remained elusive unless participants were bald. Work in the 1970s exploring stereophotogrammetric methods for

capturing head and face measurements led to the current work in 3D body scanning technology, although capturing the scalp shape has remained challenging because the hair obstructs surface topography of the scalp. This “hair effect” is more pronounced for females and remains largely unexplored. This poster highlights recent work undertaken for the United States Army to compile a digital database of 'bald' female head shapes through digitizing scalp surface and 3D scans of female heads (N=180) with hair to provide designers with representative head models to provide improved design parameters and better accommodation for our female warfighters.

Practical Insights into Estimating Sex and Age from Dental Volume Ratios Using Micro-Computed Tomography

Godwin, K.I. (1) & Gamble, J. (1)
(1) Department of Anthropology, University of Manitoba

As imaging technologies improve non-destructive data collection methods which utilize them are increasing. These new technologies are promising as they allow for a 3D record that can be revisited and shared, but they are not always practical, or easy to apply. New methods can lack sufficient detail for the technique to be replicated as this information is not prioritized during publication. Micro-computed tomography (micro-CT) is one imaging modality that can be used to estimate sex and age from dentition. Using the resources available at The University of Manitoba the possibility of estimating sex and age from micro-CT images was explored. A Skyscan 1275 micro-CT was used, followed by NRecon, CTAn, and Dragonfly 2022.2 software for image processing. The contrast resolution between tissue types (enamel, dentin and pulp cavity) was insufficient for automatic thresholding to segment the image. Using manual segmentation one slice took 15 to 30 minutes. As micro-CT scanners produce over a thousand image slices per tooth this was not a viable method. Dragonfly 2022.2 has integrated deep-learning capabilities for image segmentation. A deep learning 2D U-Net model was trained to identify the different tissue types. Training consisted of manually segmenting image slices and using them as training data. After a training session was run the model's predictive abilities were tested on additional slices. When there was a misclassification of tissue type it was corrected manually and the resulting slice was used as additional training data for the model's next training session. Once training was complete the entire image stack was segmented, and a surface mesh was applied to the different tissue types allowing for the program to calculate both surface area and volume for each one.

Exploring the Dietary Habits of Montreal Archaeological Populations (Notre-Dame Cemetery and St-Antoine Cemetery): Identification of Aquatic Resources Using Compound Specific Isotopic Analysis of Amino Acids (CSIA-AA)

Houle, É. (1), Barst, B. (2,3) & Ribot, I. (1)

(1) Department d'anthropologie, Université de Montréal
(2) Department of Earth, Energy, and Environment, University of Calgary
(3) Department of Biological Sciences, University of Calgary

Although food consumption is a physiological need, the choice of foods consumed is influenced by both environmental and cultural constraints. To study diet in past populations, bioarchaeologists have long relied on stable isotopic methods, particularly those based on carbon and nitrogen (expressed as $\delta^{13}C$ and $\delta^{15}N$ values). These “bulk” methods analyse the carbonate and collagen in bone and tooth samples. While very powerful, they have certain limitations in discriminating among specific dietary categories, especially between certain terrestrial and aquatic resources. Such a limitation was encountered during the dietary habits assessment of the archaeological population buried at the Notre-Dame cemetery (1691-1796), adjacent to the first parish church of Montreal. As this cemetery is the resting place of some of New France’s first European inhabitants, it is crucial for understanding the cultural practices migrants straddling two worlds. Previous studies suggested a strong retention of European dietary habits and a limited integration of local resources (e.g., maize) by these individuals. Although historic sources mentioned high fish consumption, possibly linked to Catholic practices, this could not be detected using bulk stable isotope analyses. To address this shortcoming, this study uses a fingerprinting method based on the analysis of $\delta^{13}C$ values of essential amino acids (CSIA-AA) in dentin collagen. This approach has proven effective for identifying a reliance on aquatic resources (marine and freshwater). Moreover, this project explores the evolution of fish-based diets in Montreal by including individuals from the St-Antoine cemetery (1799-1855), which replaced Notre-Dame cemetery once the latter closed down. Finally, zooarchaeological remains of culturally and economically significant species (beaver, catfish, moose, cattle, and pig) are included for comparative purposes. This is the first study to apply the CSIA-AA method in bioarchaeology for the Canadian North-East.

A test of the reliability of estimating menarcheal status in juvenile remains from dental and skeletal maturation

Ilkhan, T. (1), Goodarzi, P. (1), Andrade, M. (2) & Cardoso, H. (1)
(1) Department of Archaeology, Simon Fraser University
(2) Departamento de Métodos Quantitativos, ISCTE-IUL, Lisboa, Portugal

While bioarchaeologists are starting to appreciate and develop approaches to the study of puberty and adolescence in past populations, there is still limited research on how to estimate sexual maturation from skeletal and dental observations. This study addresses this gap by using logistic regression to examine the relationship between menarcheal status (pre- or post-menarche) and skeletal and dental maturation in a longitudinal sample of 34 French-Canadian girls aged 6 to 19 from the University of Montreal Growth Study. Dental maturation was assessed using Demirjian’s stages, while skeletal maturation was evaluated using the hand-wrist Tanner-Whitehouse technique. The results identified the distal radius and the lateral incisor as the strongest predictors of

menarcheal status. Models generated from the radius were used to determine pre- and post-menarcheal status on a known sex and age skeletal sample of adolescent girls (n=23) between 10 and 18 years of age from the Lisbon skeletal reference collection, housed at the National Museum of Natural History and Science in Lisbon, Portugal. The age of menarche was then estimated from this skeletal sample by using logistic regression. The mid-point between the distribution of pre- and post-menarcheal status girls was used as the median age of menarche in the population. The estimated age of menarche in this sample (~14 years of age) compares well with published research about the mean age of menarche carried out at the time the girls in the skeletal sample lived in Lisbon (1920-1940). This indicates that the approach provided here can estimate menarche in archaeological populations and be added to the bioarchaeologist's toolbox. While this methodology has a significant caveat associated with the unreliability of sex estimation in adolescent skeletons, it has the potential to provide important insight into reproductive health and the social and nutritional conditions of past populations.

****"Malignant melanoma - a one-year wait, a one-second diagnosis": Walk-in dermatology staff perspectives on care challenges**

Islam, A. (1), Taylor, J. (1) & Mant, M. (2)
(1) Department of Anthropology, University of Toronto
(2) Department of Anthropology, University of Toronto Mississauga

The traditional model for specialist consultations in Canada poorly facilitates information flow, leading to long appointment wait times, and is a potential barrier to access for the approximately 20% of Canadians lacking a primary care provider (PCP). Dermatology, for example, involves an initial referral and subsequent treatment coordination with several other health providers. Delays in diagnosing and managing skin diseases such as melanoma are associated with worse patient outcomes. PCPs are gatekeepers due to their role in initiating referrals, making them an essential contact point on the administrative path to specialist access. Given that structural iatrogenesis can arise from bureaucracy in health systems, difficulties surrounding specialist care for PCP-less patients are critical to consider. This study explores the challenges that specialist clinic staff face when treating patients who lack a PCP. The project was conducted at the Toronto-based Dr. Andrew Simone Walk-in Dermatology clinic, one of Canada's only walk-in dermatology providers. The clinic's walk-in nature facilitates interactions between specialist staff and patients disadvantaged by the referral-focused system. This research provides insights into staff interactions with a population that would otherwise go unrepresented at other non-walk-in specialists. The project comprises of semi-structured interviews with nine employees belonging to various positions at the clinic. The challenges of providing care and the stories shared by staff about patients' journeys to finding a referral-free specialist underscore the impact that accessibility has on patients' treatment and prognosis while providing insights into the lives of both staff and patients. Using a biocultural lens, I will outline the preliminary findings of these conversations and spotlight themes of time in waiting for services, the effects of the

PCP's gatekeeper role, and staff responsibility in negotiating care gaps to explore how the PCP's absence affects specialist care provision and patient health outcomes.

****Exploring childhood diet and health in Alkmaar, the Netherlands: Preliminary insights from stable isotope analysis of hair**

Lovatt, C. (1), Veiga Rilo, C. (2), van der Merwe, A. E. (3), Longstaffe, F. J. (4), Cooke, A. (5), Langlois, M. (5), Roberge, É. (1), Brickley, M.B. (5) & Waters-Rist, A. (1)
(1) Department of Anthropology, Western University
(2) Area of Archaeology, Department of History, Universidade de Santiago de Composteia, Spain
(3) Department of Medical Biology, Amsterdam UMC, location AMC, the Netherlands
(4) Department of Earth Sciences, Western University
(5) Department of Anthropology, McMaster University

Historical records highlight that by the 17th century, urbanization in the Netherlands had profoundly altered food production, trade, and socioeconomic structures. The specific effects on diet and health, however, remain relatively underexplored. This preliminary study addresses this gap by analyzing dietary patterns through stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope analysis of hair samples from 14 non-adult individuals (< 13 years old) who were interred at the Great Church of St. Laurens in Alkmaar, the Netherlands. Hair is advantageous for isotopic studies due to its rapid growth, which allows for the detection of short-term dietary and possibly health changes. Using incremental sampling, wherein 1cm of hair represents around one month of a person's life, minimal (<0.5‰) intra-individual isotopic variation was found, suggesting little variation in diet from month to month. Two infants, aged 8 months and 1.5 years, have an isotopic signal consistent with breastfeeding, which is absent in a 9 month, 12 month, and two 1.5 year olds. Excluding isotope values likely elevated because of breastfeeding, there is more pronounced inter-individual isotopic variation ($\delta^{13}C$ and $\delta^{15}N$ vary by 1.9‰ and 3.3‰, respectively) suggesting some individuals consumed higher trophic level terrestrial protein and/or brackish and freshwater fish. Altered isotopic metabolism because of malnutrition or illness near the end of life may be evident in a 7 year old who experienced rickets and scurvy in earlier life. When combined with historical, osteological, and pathological analyses, these data will contribute to a broader investigation aiming to explore the relationship(s) between diet and disease across different populations in the Netherlands during times of significant social change.

****The Use of Thoracic Elements in Bioarchaeological Trauma Studies**

Magalhaes-Filion, M. (1)
(1) Department of Anthropology, University of Toronto

Osteological trauma analyses help researchers understand everyday life in archaeological assemblages by investigating labor division, instances of interpersonal violence, or work-related risks. The long bones and skull typically receive increased attention in trauma analyses while smaller, often fragmented skeletal elements, such as the ribs, vertebrae, clavicles, and scapulae, are usually less thoroughly discussed. Clinical literature, however, identifies the thorax as a significant location for intentional trauma, and bioarchaeological literature recognizes the elevated frequency of rib fractures in accidental impacts. This study aimed to evaluate how traumatic lesions to the thorax can contribute to the understanding of a group's lifestyle and how trauma may vary between cultural contexts. Using 36 medieval English (Fishergate House, York, 14th-15th century) and 16 industrial English (Coach Lane, Tyne and Wear, 18th-19th century) individuals with prerecorded evidence of trauma, the ribs, vertebrae, clavicles, and scapulae underwent macroscopic, radiographic, and stereomicroscopic analyses. Fractures and sharp force traumatic lesions present on these elements were analyzed by anatomical section to evaluate variations in the presentation of trauma. Statistical analyses (Chi-Square and Fisher Exact tests) were performed, revealing significant differences ($p<0.05$) between the sites. The medieval sample exhibited more fractures to each element, expressed cases of sharp force trauma, and contained significantly more injury recidivists than the industrial group. Analysis of one medieval individual in particular revealed multiple instances of previously unrecorded perimortem sharp force trauma, changing the existing understanding of their death. This research further highlights the value of considering ribs, vertebrae, scapulae, and clavicles in trauma studies and why they should be studied in tandem with skulls and appendicular long bones. These skeletal elements independently reflect the respective cultural contexts of the selected skeletal samples and allow for comparisons of different lifestyles' impact on the body.

The Biocultural approach in Medical Anthropology in Canada: A scoping review

Mian, M. (1) & Tripp, L. (1)
(1) Department of Anthropology, Trent University

The biocultural anthropological approach has been associated with research within the subfield of biological anthropology. The extent to which Canadian biological medical anthropologists embrace a biocultural approach is unknown. Further, the precise definition of the biocultural approach is not clearly defined.
For this presentation we used a Google search of faculty university biographies to identify: 1. Medical anthropologists who are faculty members at a public post-secondary institution in Canada. 2. Medical anthropologist who self-identify as using biocultural methods. 3. The main research areas that fall under the 'biocultural approach' or similar terms. Our preliminary findings suggest that in departments with at least one medical anthropologist, out of the 444 anthropology faculty, 27.7% of the faculty identified as belonging to the subfield of biological anthropology. Out of all anthropology faculty, 10.36% identify as medical anthropologists - accounting for about 1/3 of the biological anthropologists. Shockingly, only 3.2% of anthropology faculty self-identified as a

biological medical anthropologist. Out of all the medical anthropologists in Canada, only 30.43% identify as biological medical anthropologists.
Among the biological medical anthropologists, the most common research areas include disease, global and public health, nutrition and diet, and maternal health. Less common areas of interest are mental health, trauma and surgery, and disability studies.
Achieving a precise percentage as to who are medical anthropologists proved to be a challenge. Many anthropologists who engage in health and medical related research can fall under the umbrella of medical anthropology but do not identity on their biographies as medical anthropologists. We propose more clear boundaries to defining biological medical anthropology that includes the use of terminology such as the biocultural approach. Further research will require interviews with medical anthropologists and anthropologists who engage in health-related research in Canada to elucidate their perspectives on what is biological medical anthropology.

Social Differences in the Secular Trend of Height in Portuguese Boys Over the Twentieth Century

Murray, N.J. (1) & Cardoso, H.F.V. (1)
(1) Department of Archaeology, Simon Fraser University

Secular changes in height of children are used to assess long term trends in economic and social development in and between populations. Portugal has experienced significant social and economic changes over the twentieth century, in particular, those associated with the rise and fall of the longest standing European dictatorship, between 1926 and 1974. In this paper, we use height data from Portuguese boys who attended two residential schools of distinct socioeconomic makeup throughout the twentieth century. Different cohorts of boys in these schools experienced economic and social changes before, during and after the dictatorship. A combination of primary and secondary data was collected from four periods (1910, 1930, 1960, and 2000), from a military high status boarding school, Colégio Militar (aged 10 to 16 years), and a school for underprivileged children, Casa Pia de Lisboa (aged 10 to 16 years). Height changes over time within each school were used to assess general socioeconomic trends and are then compared between each school to assess trends in social inequality. Results show a consistent secular increase in height over the twentieth century for both schools, with a greater increase with the transition to democracy in the 1970s. Data also indicates that throughout this period, there is a reduction followed by an increase in social inequalities during the dictatorship that the democracy was not able to diminish. These results confirm existing research that document a similar secular trend in height over the 20th century in Portugal and suggest that the dictatorship had a detrimental impact on growth via increased social inequalities.

****Evidence of Skeletal Manifestations of Gender-Affirming Medical Interventions for the Preliminary Identification of Trans Individuals**

Nemett, J.A.S. (1) & Albanese, J. (1)
(1) Department of Integrative Biology, University of Windsor

Transgender individuals are more likely to be victims of violence or homicide due to systematic discrimination. Because of the higher risk of violence against trans individuals, it is now more important than ever to ensure that forensic anthropologists are equipped with methods to effectively identify deceased individuals as trans. This paper will highlight descriptions of changes that could be used by forensic anthropologists to recognize skeletal manifestations resulting from gender-affirming surgeries, including facial feminization surgery (FFS), shoulder width reduction surgery, and limb-lengthening procedures. When present bilaterally and without evidence of trauma, these changes serve as key indicators of a person's transgender identity postmortem. By integrating these indicators with traditional forensic methods, this research aims to enhance identification accuracy, offer closure to families, and support the rights of transgender individuals in forensic investigations.

Diet and activity budget in parenting and non-parenting female mantled howler monkeys (*Alouatta palliata*)

Nie, L. (1,2)
(1) University of Toronto Mississauga
(2) Maderas Rainforest Conservancy

In adult female mantled howler monkeys (*Alouatta palliata*), parenting may cause changes in behaviour and diet due to the energetic burdens associated with infant dependency, and ecological disturbances such as forest fragmentation may also affect this trend. This study examined the differences in activity and diet between parenting and non-parenting adult female mantled howler monkeys within a fragmented forest. In order to meet increased nutritional requirements, I predicted that parenting females would engage in more active behaviours (feed, forage, travel) and consume more nutrient-rich foods (fruit, leaf) compared to non-parenting females. 26.6 hours of focal data on individual monkeys were collected in July 2024 at La Suerte Biological Research Station (LSBRS), Costa Rica. Data were collected on both parenting and non-parenting female howler monkeys using 30min focal samples with instantaneous scans taken each 1min on activity (feed, forage, travel, rest, other) and plant parts eaten (fruit, leaf, flower, stem). Out of overall activity budgets, parenting females spent more time feeding (26.7% vs. 24%), foraging (3.7% vs.1.5%), and travelling (12.4% vs. 6%), and less time resting (52.5% vs. 63.9%) compared to non-parenting females. During feeding, parenting females ate more nutrient-rich foods such as fruit (25.8% vs. 6.6%) and leaves (56.9% vs. 49.7%) and fewer flowers (17.2% vs. 42.5%) and stems (0% vs. 1.2%) compared to non-parenting females. Parenting females may need to feed and forage more to fulfill greater nutritional requirements, and to travel more to find food due

to feeding competition and resource scarcity in LSBRS, a fragmented forest with high animal population density. Parenting females also consumed higher-quality diets with more fruit and leaves at LSBRS compared to non-parenting females, who consumed more low-quality foods such as stems. Further research in fragmented forests is required to better understand how females in varying reproductive stages adapt to disturbed ecologies.

Efficacy of community-derived, plant-based treatment for *Pediculus humanus capitis*, a common childhood condition

Novogradac, C. (1) & Galloway, T. (1)
(1) Department of Anthropology, University of Toronto Mississauga

Head lice (*Pediculus humanus capitis*) are a common issue among all population groups, and though they are easily treated with over-the-counter pharmaceutical preparations, many communities seek locally-derived, plant-based remedies.
The research team was approached by staff and Elders from a First Nation Friendship Centre in Northern Ontario to examine whether locally harvested and prepared Labrador/Muskeg Tea (*Rhododendron groenlandicum)* is a safe and effective treatment for head lice. To date, there is limited pharmacological literature on the pharmaceutical properties of *R. groenlandicum* confirming its value in traditional, ethnomedical uses as an anti-inflammatory, analgesic and antimicrobial. This poster reviews the available literature on *R. groenlandicum* to provide context for community-led research into the efficacy of existing modes of harvesting, drying and preparation as a precursor for local knowledge sharing.

****Breathing Biocultural Life into the Archives: Child Morbidity at an 18th-century Rural Voluntary Hospital**

Parry, C. (1), Chau, J. (1), Hull, B. (2), Khan, M. (3), Sheptenko, M. (1), Taranissi, M. (1), O'Dell, F. (3), Williams, A. (3) & Mant, M. (2)
(1) Department of Anthropology, University of Toronto
(2) Department of Anthropology, University of Toronto Mississauga
(3) Department of Anthropology, University of Toronto Scarborough
(4) Northampton Infirmary Archives, Northampton General Hospitals NHS Trust, Cliftonville, Northampton, UK

English voluntary hospitals were established in the 18th century to serve poor, working-class people admitted based on charitable needs. While officially excluded from care at such institutions (the first English pediatric hospital was founded in 1852), some children were still accepted for treatment. Digitized archival hospital admission records from the Northampton General Hospital (NGH) include the ages of patients (an extreme rarity for the period), allowing for an investigation of child morbidity and mortality from 1744 to 1804. This biocultural research explores the differences between child and adult

patients to investigate how a study of morbidity aids in understanding the life courses of rural children. This work draws upon the newly created Northampton Infirmary Eighteenth Century Child Admission Database (NIECCAD), revealing that in its first 30 years of operation, nearly 14% of all patients treated at NGH were 13 years or younger. These children were treated for a range of acute and chronic conditions, including rickets, tuberculosis, worm fever, and epilepsy. On average, inpatient children stayed in hospital for 15 weeks, and most (74.5%) were discharged as cured, with only 0.9% dying in hospital. Comparisons between the adult and child patients reveal statistically significant ($p < 0.05$) differences in the proportion of individuals assessed for various distempers. Children were more likely to be seen for skin disease, eye problems, digestive issues, surgical infections, and surgical conditions such as ruptures, emphasizing that children were not 'little adults' but a unique group with distinct medical needs. By examining the types of conditions requiring care, the average lengths of stay, and the discharge outcomes, we can explore the relationship between pediatric care and health outcomes for children in this period.

A Universal Design for Learning Osteology: Virtual Reconstructions and 3D Models

Praill, K.S. (1), Blott, E.G. (1) & Gilmour RJ (1)
(1) Department of Sociology & Anthropology, Mount Royal University

Students have diverse needs and abilities and there is an increasing need to incorporate universal design in higher-education instructional approaches. In biological anthropology laboratory settings, creative integration of three-dimensional (3D) virtual and physical modeling approaches (e.g., animations and replicas) can increase accessibility and support student learning. These additional resources allow learners to study materials at their own pace and in alternative environments where they may feel more focused and comfortable. To support junior osteologists in learning to identify and refit fragile skeletal fragments, we suggest a workflow that begins with 3D digitization of archaeological remains for the purpose of 1) animated digital reconstructions and 2) creation of durable, puzzle-type replicas. First, to help learners visualize how broken bone edges match, the process of refitting actual fragments is virtually modeled using Blender, an animation software. Next, 3D printed replicas are created that allow any learner to confidently handle and refit fragmentary remains. Both steps will support individuals who are uncomfortable or unable to touch actual bone; creation of physical replicas may also facilitate equal opportunity to the visually impaired by providing a way to explore osteology fundamentals through touch. While we expect that these approaches will benefit learners and address some accessibility concerns, the ethics of scanning and 3D modeling should be considered; consent of the individual, the descendant communities, or their representatives (community of care) must be in agreement. When conditions are met, we argue that virtual reconstructions and strategic 3D printed models can supplement biological anthropology laboratory teaching by enhancing accessibility and contributing to the development and integration of universal design principles. Through community outreach, these approaches have the

potential to extend bioarchaeological educational opportunities to non-specialist learners with limited experience.

The relationship between social interactions and age in mantled howler monkeys (*Alouatta palliata*)

Qi, K. (1,2)
(1) University of Toronto Mississauga
(2) Maderas Rainforest Conservancy

This study investigates the age-related variations in social interactions among mantled howler monkeys (*Alouatta palliata*) at La Suerte Biological Field Station in Costa Rica. The primary aim is to understand how affiliative behaviors, such as allogrooming, body contact, and play, differ across age groups, thereby shedding light on the developmental processes that shape primate social behavior. Data were collected through point sampling over 25 observation hours, focusing on 75 howler monkeys categorized into infants, juveniles, and adults, with each individual sampled for 20mins and points taken each 1min. The results revealed that social interactions decreased with age; infants displayed the highest frequencies of affiliative behaviors, followed by juveniles, and adults exhibited the least. Infants engaged predominantly in play and allogrooming, which are crucial for developing social skills and group cohesion. In contrast, adults showed a marked shift towards non-social behaviors such as resting and feeding, highlighting an age-related transition from social engagement to individual-focused activities. These findings align with previous research on primate behavioral ecology, supporting the hypothesis that early social experiences are vital for the development of social bonds and hierarchical structures. The study's insights contribute to our understanding of primate social dynamics and emphasize the importance of age in shaping social roles within groups. These developmental trajectories have broader implications for primate conservation and the evolution of social behavior, providing a foundation for future research on age-related social changes across different primate species.

Diverse Histories, Common Ground: Bioarchaeological Life Histories from Antigua’s Royal Navy Cemetery

Ross, J. (1), Swanston, T. (2), Waters, C. (3), Gardner, D. (3), Brown, M. (4), Murphy, R. (3) & Varney, T. (5)
(1) Woodland Heritage Northwest, Thunderbay, ON
(2) Department of Biological Sciences, City Centre Campus, MacEwan University
(3) National Parks Authority of Antigua and Barbuda, Antigua, West Indies
(4) Department of Sociology and Anthropology, Farmingdale State College, State University of New York, New York, USA
(5) Department of Anthropology, Lakehead University

In bioarchaeology, life history reconstruction has become an important method in highlighting individuality among past populations. Here we report on the life histories of three individuals from a cemetery associated with a British Royal Navy Hospital in Antigua, West Indies (C.E. 1766-1840). The cemetery was the final resting place for a diverse group, including low-ranking British sailors and enslaved as well as free African labourers or soldiers. The site was excavated due to disturbance from an ever-expanding residential neighbourhood. Of the thirty-one individuals excavated, we focus on three who are representative of the population. Their life histories were reconstructed using isotopic analyses, including carbon (C) and nitrogen (N) to investigate diet, and oxygen (O) and strontium (Sr) to trace geographic origins and mobility. Lead (Pb) isotopes and elemental maps reveal the extent of their exposure to the toxic element. Among the three, one is a documented assistant surgeon, identified by the only inscribed tombstone at the site, whose isotopic profile contrasts sharply with two African-descended individuals, likely highly skilled enslaved or free Dockyard labourers. The reconstructed narratives will contribute to the ‘The 8th of March Project’ by the National Parks Authority which seeks to gather as much information on African individuals and their contributions to the functioning of the Dockyard during the colonial era. A key objective of the project is to trace connections between past populations and modern inhabitants, potentially uncovering links to their descendants.

Applications of Dragonfly for Visualizing Features Associated with Cranial Modification in Fardos

Rountree, S. (1), Nakahodo Moromizato, T.N. (1) & Nelson, A. (1)
(1) Department of Anthropology, Western University

Cranial modification was a significant and widespread cultural practice associated with expressed identity — by studying modified skulls, insight into these identities can be gained. Cranial modification was a common practice in South America — it became commonly practiced by ancient Peruvians starting in ~500 BCE. The sample used in this project consists of computed tomography (CT) scans of mummy bundles from the archaeological site of Pachacamac, Peru, located 30 kilometers southeast of Lima. Using Dragonfly 3D World imaging software, these scans (n = 18) were cropped to include only the crania and then segmented using Deep Learning algorithms to create regions of interest, from which meshes were created. Areas of porosity became highly visible on these meshes — the existence of porosity could be further observed and confirmed on the slice views of these scans. Crania from this sample showed patterns of porosity on the occipital bones and sphenoid bones, along the coronal sutures, and on the mastoid processes. Similar observations have been made on dry bone crania in an earlier thesis emerging from this project — however, it was concluded that further research in this aera is needed. The meshes created from the CT sample show possible applications of Dragonfly to help support and further research regarding cranial features in *fardos*. Dragonfly can be used as a non-invasive technique for studying mummies as it can isolate skeletal material from a cluttered environment. Therefore, Dragonfly is a good tool for studying skeletal material in fragile environments where destructive

methods are not suitable. This presentation is part of a larger study of the use of geometric morphometrics to analyze cranial modification in this ancient Peruvian sample.

****Echoes of contamination: Investigating heavy metal exposure through trace element analysis of human teeth from Wadi Faynan 100, Jordan**

Ruddell, K. (1), Dolphin, A.E. (1), Adams, R. (1) & Yakymchuk, C. (2)
(1) Department of Anthropology, University of Waterloo
(2) Department of Earth and Environmental Sciences University of Waterloo

Located in southern Jordan, Wadi Faynan was once a centre for copper mining, smelting, and trade during the Early Bronze Age (EBA). The legacy of pollution in Wadi Faynan is visible in the contemporary landscape in the form of spoil tips and over 250 copper mines. The largest and possibly most significant EBA site in Wadi Faynan is Wadi Faynan 100 (WF100), which dates to EBA Ib (3300-3000 BCE) and has clear evidence of copper production including copper ores, a copper awl, and copper casting molds. This research employed laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) to measure trace element concentrations of lead (Pb), cadmium (Cd), and arsenic (As) in human enamel from WF100 to determine if copper production during EBA Ib introduced heavy metal toxicity into the population. The sample consisted of 28 human teeth divided into three groups representative of different early life stages: first molars, premolars, and third molars. All 28 samples had trace amounts Pb, Cd, and As. Four individuals had maximum Pb concentrations > 1.0 ppm, five individuals had maximum concentrations < 1.0 ppm and > 0.5 ppm, 17 individuals had maximum concentrations < 0.5 ppm and > 0.1 ppm, and two individuals had maximum concentrations < 0.1 ppm. Six individuals had Cd concentrations > 0.5 ppm and < 1.0 ppm, and 28 individuals had concentrations < 0.5 ppm and > 0.1 ppm. Lastly, three individuals had As concentrations > 1.0 ppm, 22 individuals had concentrations < 1.0 ppm and > 0.5 ppm, and three individuals had concentrations < 0.5 ppm and > 0.1 ppm. Examination of the distribution of these heavy metals across the growth layers of enamel revealed inter- and intra-individual variation in exposure providing insight into how socio-cultural and economic activities of copper production affected the health of the WF100 population.

Byzantine mass graves: A case study of juveniles at Ismenion Hill

Strickland, E. (1) & Liston, M. (1)
(1) Anthropology Department, University of Waterloo

As vulnerable members of past populations, children are essential to understanding health in a bioarchaeological context. Few publications address the presence of juveniles in mass graves in Byzantine period Greece. Moreover, limited research discusses evidence of skeletal pathologies in relation to social, environmental, and

cultural factors influencing juvenile health in late antiquity. This study presents observations of pathology on juvenile skeletal material recovered from two mass graves from a Byzantine period cemetery (5th-9th c. CE) on Ismenion Hill in Thebes, Greece. This cemetery may have been reserved for sick individuals in the early Byzantine period, as a high prevalence of skeletal pathologies were observed across the adult and juvenile samples. The two mass graves at Ismenion Hill, Graves 19 and 20, presented a minimum of 18 individuals, nine of which were juveniles. Utilizing differential diagnosis, four of the nine juveniles studied in Graves 19 and 20 presented with skeletal (n=3) or dental (n=1) pathologies. Pathologies included likely cases of scurvy and metabolic deficiency (n=2), dental calculus (n=1), and non-specific infection (n=1). In addition, pathogen aDNA testing revealed Salmonella enterica in a dental sample from an adult in Grave 19, suggesting typhoid fever may have played a role in the deaths of the individuals interred in these graves. While typhoid fever is primarily a gastrointestinal disease that does not present skeletal symptoms, a juvenile experiencing an infection or metabolic condition would be more susceptible to contracting typhoid fever. Therefore, this study addresses the potential role of typhoid fever in the mortality of juveniles at Ismenion Hill with respect to skeletal observations of pathology, and biocultural factors shaping childhood health in the Byzantine period.

Adult forensic age estimation from secondary dentine deposition: A test of the pulp/tooth ratio method in a U.S. population

Tamayo, A.S. (1), Perez, B. (1), Behunin, K. (1), Caccavari, C. (1), Robinson, N. (1) & Spake, L. (1)
(1) Binghamton University

Estimating age in forensic anthropology is challenging in individuals over the age of 50 years, especially if taphonomic changes have altered skeletal structures. Dental age estimation methods have been proposed to enhance age estimation in older adults as dental structures may be both less variable in their age-related degeneration and more taphonomically resistant than skeletal structures.
In this study, we test one method for dental age estimation in adults: the pulp cavity/tooth area method. This method measures the progression of secondary dentine deposition within the pulp cavity of the tooth by calculating the ratio of the area or volume of the pulp cavity relative to the entire tooth.
Cone-beam computed tomography (CBCT) dental scans, taken as part of routine clinical practice, from 150 individuals aged between 21 and 90 years were selected from a dental practice in upstate New York. Mesio-distal images of the mandibular canine were produced using Dragonfly (ORS) to simulate a panoramic x-ray; tooth and pulp areas were measured using Inkscape. The ratio between tooth/pulp areas was calculated and age was estimated using the Cameriere et al. method (2007). Residuals and correct prediction rates were calculated.
The method performed poorly, with a mean absolute error of 17 years. Only half of individuals were correctly estimated by the 95% prediction interval. Prediction error showed age bias: younger individuals were consistently overestimated and older

individuals consistently underestimated. Predictions were considerably worse for individuals over 65 years of age.
The method performed poorly in our sample. Several factors may explain this: 1) inter-population variation in the rate of secondary dentine deposition; 2) imaging modality and processing workflow, as other teams have found inconsistent results when using CBCT; 3) biocultural dental modifications including wear of the crown and fillings may impact reliability of results especially in older adults.

****Examining the Influence of Cremation on Macroscopic and Microscopic Bone Structures, and DNA Recovery for Improved Human Identification**

Thibodeau-Cadieux, E. (1), Beauchamp, A.M. (1) & Currie, K.A. (1)
(1) School of Natural Sciences, Laurentian University

Human identification is a crucial step in criminal and civil cases involving deceased individuals. In certain circumstances, cremated remains may be the only viable source of information available for identification purposes, leading investigators to rely on deoxyribonucleic acid (DNA) and anthropological measures, which have their own respective challenges. This study investigated the impact of temperature on the quantity and quality of DNA that can be extracted from cremated pig rib bones. In addition, the study assessed the potential correlation between macroscopic and microscopic characteristics of burned bones and DNA recoverability. Bones subjected to a range of temperatures from 100 °C to 800 °C underwent macroscopic and microscopic assessment to observe changes in colour and surface texture from their heat treatment. These bones then underwent DNA extraction using the Applied Biosystems PrepFiler Express BTA Forensic DNA Extraction Kit, following the protocol for bones and teeth, on the AutoMate Express Forensic DNA Extraction System and DNA quantification using a Nanodrop Spectrophotometer. The bone colour patterns in this study followed the expected pattern of colouration beginning with beige, transitioning to black at 350 °C, and then becoming lighter until it reaches white at around 800 °C. The microscopic observations showed the presence of striations at temperatures below 275 °C and the presence of porosity at temperatures above 275 °C. Bones with a black, grey, or white colour and visible porosity were observed in conjunction with a decrease in the amount and purity of DNA. Despite this noted decline in DNA quality and quantity, all the analyzed bones had DNA amounts exceeding 240 pg, making them potentially suitable for short tandem repeat (STR) polymerase chain reaction (PCR) amplification. This study provided valuable insights and furthers our understanding of DNA recovery from cremated bones in an effort to enhance human identification techniques.

****Theorizing Decolonial Approaches to Understanding Biological Affinities: Lessons from Exploring Facial Soft Tissue Thickness Variation in Western Canada**

Tremblay, S.A. (1)

(1) Department of Anthropology, University of Alberta

Forensic facial approximation remains a vital investigative tool for the identification of unidentified human remains. To accurately reflect the deceased individual's appearance in life, previous authors have suggested that practitioners should apply population-specific soft tissue depth markers at defined craniofacial landmarks. However, few studies have critically examined interpopulation variation in facial soft tissue thickness (FSTT). For this reason, this project aims to answer the question of to what extent FSTT data can and should be subdivided on the basis of population affinity in addition to sex, age, skeletal class (dental occlusion), and body mass index (BMI). Through the completion of an unsupervised cluster analysis of original sonographic data collected from a diverse Western Canadian sample and augmented with existing FSTT data, cluster composition is evaluated to explore patterns in group membership. This method allows for meaningful data exploration without presupposing (and imposing) assumed patterns of biological affinities. While this research is ongoing, preliminary results suggest there might be differences between clusters attributable to self-reported biogeographical ancestry. However, these differences may be driven by the physiological incorporation of health inequalities between populations as opposed to the phenotypic expression of true genetic variation. Additional research is needed to better understand these complex patterns.

****Trauma Pattern Analysis at Early Bronze Age Wadi Faynan 100, Jordan**

Vieira, O. (1), Dolphin, A. (1) & Adams, R. (1)
(1) Department of Anthropology, University of Waterloo

The analysis of the frequency and pattern of trauma observed in a sample can help with interpreting aspects of life in past communities, including occupations, levels of interpersonal violence, and caregiving. Human skeletal remains from Wadi Faynan 100, an Early Bronze Age I (3600-3000 B.C.) site in Jordan with multiple charnel houses containing commingled remains were assessed for indicators of trauma. Examination of 465 elements (MNI=21), including cranial fragments, long bones, vertebrae, and innominate fragments from 13 charnel houses was conducted. All elements were analyzed visually for indicators of trauma and all trauma was recorded and described using recording forms. Trauma was most frequently observed in the skull (7/61 elements, 11.5%), with a low frequency of trauma (13/465 elements, 2.8%) observed in the sample overall. Multiple blunt-force traumatic injuries to the skull and four sharp-force injuries indicated a lower-than-expected level of interpersonal violence. A lower frequency of interpersonal violence is observed when the WF100 data is compared to the published data from Bab edh-Dhra, an Early Bronze Age I site in Jordan where trauma has been studied. The presence of multiple antemortem injuries (4/13) in different stages of healing indicates some level of caregiving within the community due to the types of antemortem trauma observed; the injuries would have needed time to heal, affected day-to-day activities, and required some level of care from others. A low frequency of vertebral fractures (2/240, 0.8%) indicates a less physically demanding

and hazardous lifestyle. Based on the overall low frequency of trauma, it can be said that individuals at WF100 did not often suffer traumatic injuries related to hard labour, accidents, or interpersonal or large-scale violence.

Vertebral Pathology in Mycenean and post-Mycenean Individuals buried in the Athenian Agora, Greece

Weerasinghe, P. (1), Liston, M (2) & Waters-Rist, A. (1)
(1) Department of Anthropology, Western University,
(2) Department of Anthropology, University of Waterloo

This research examines the prevalence of pathological conditions of the vertebrae in the Greek Athenian Agora skeletal collection as evidence of the physical activity and mechanical stress experienced by Mycenean (1700-1150 BCE) and post-Mycenean (1150 BCE-1821 CE) individuals. A total of 122 adults (18+ years) were macroscopically assessed for osteoarthritis (OA), intervertebral disc disease (IDD), and Schmorl's nodes. For OA, the presence of pitting and lipping on the articular facets of the vertebrae was recorded. IDD was determined based on the presence of a combination of pitting, lipping and/or ankylosis of the vertebrae. The superior and inferior vertebral bodies were also examined for Schmorl's nodes. Frequency data are compared by sex, age group and between the Mycenean vs. post-Mycenean groups using chi-squared or Fisher exact tests. Twenty four percent (29/122) of individuals had OA in the spine, 33% (40/122) had IDD and 17% (21/122) had Schmorl's nodes. There was no significant difference in OA or IDD prevalence between the Mycenean and post-Mycenean individuals. Schmorl's nodes were more common in the Mycenean (n=15) than post-Mycenean (n=6) individuals, but this difference was not statistically significant (x^2= 1.532, p=0.216). All conditions were consistently more prevalent in males (n=17 for OA, n=22 for IDD and n=14 for Schmorl's nodes) than females (n=12 for OA, n=18 for IDD and n=7 for Schmorl's nodes). However, statistical analyses did not indicate a difference between vertebral lesions and sex for OA (x^2=0.48, p=0.488), IDD (x^2=0.676, p=0.411) or Schmorl's nodes (x^2=3.333, p=0.679). There was a statistically significant difference between age groups (young, middle, old) and OA (x^2 =15.236, p=0.009) and IDD (x^2 =17.557, p=0.003), but not Schmorl's nodes (x^2 = 7.969, p=0.158), showing that that likelihood of developing OA and IDD increased with age. Since the relationship between vertebral pathology and sex was not statistically significant, it may indicate that males and females buried in the Athenian Agora engaged equally in physically demanding tasks that placed strain on their spines. While sex-related divisions of labour are detailed in historical sources, bioarchaeological studies of mechanical stress in ancient Greek populations have also not found clear sex related divisions. The lack of significant difference in vertebral pathology between the two time periods suggests there was little to no change in the physical demand of activities between the Mycenean and post-Mycenean periods.

Applying Bone Densitometry to Commingled Bone Fragment Identification in Forensic Anthropology

Whitelaw, H. (1) & Rogers, T.L. (1)
(1) Department of Anthropology, University of Toronto

Accurate methods for reassociating commingled fragmented skeletal remains are one of the greatest complications faced by forensic anthropologists. Commingling, the mixing of human remains, results from contexts including mass graves, high-casualty mass disasters, and bioarchaeological contexts such as deliberate Indigenous ossuary burials. Currently in commingling cases, reassociation is conducted using visual methods, however, these methods offer uncertain accuracy and can be highly-observer biased. Dual-energy Xray Absorptiometry (DXA), also known as bone densitometry, is an imaging technology used in clinical medicine to quantify bone mineral density (BMD) to evaluate bone health in living patients. The purpose of this research is to determine whether bone densitometry can be used to reassociate commingled fragmented skeletal remains using BMD measurements. A pilot study was performed using DXA scans on an identified left and right femoral fragment sample (n=32) to assess the BMD in each fragment. The BMD measurements were compared using paired t-tests to assess if bone densitometry can accurately reassociate the fragments or exclude possible fragment matches based on similarities or differences between BMD. There was no significant difference between left and right femoral BMD values (p=1.0460216), indicating that reassociation is possible even if fragments differ in size. Most notably, this study found that fragment matches or exclusions can be made using BMD even when visual morphology is similar between many fragments or differs between matching pairs. This indicates a benefit to combining visual methods of reassociation with bone densitometry to increase reassociation accuracy. This research serves as a foundation for the development of a more systematic bone fragment identification method for various commingling contexts. It can also benefit repatriation efforts by providing families with a greater amount of recovered identified remains of their loved ones. More broadly, it highlights the applicability of clinical imaging techniques to forensic and biological anthropology.

Health and Disease in Byzantine Thebes: A dental analysis of the site of Ismenion Hill

Wood, R. (1)
(1) Department of Anthropology, University of Waterloo

This study aimed to develop an understanding of the demography and health of the population at the archaeological site of Ismenion Hill, Thebes, Greece, dating to the early years of the Byzantine period (416-537 AD). Over 1800 individual teeth, both loose and in-situ, were identified and assessed for pathologies. Through an estimation of the number of individuals present and approximate ages-at-death, it was suggested that 210 people were buried at Ismenion Hill, with 60% of the population dying as non-

adults. Further, diet was evaluated through the prevalence of dental calculus and caries, which suggested the population relied more heavily on plant food than meat, and that they possibly practiced a mix subsistence custom of both hunter-gatherer and agriculturalism. Moreover, the high prevalence of linear enamel hypoplasia that developed during ages two to six years, suggested the corresponding weaning phase of childhood was highly stressful due to unsafe practices. Additionally, four individuals exhibited a unique combination of periodontal disease, dental calculus and caries, antemortem tooth loss and uneven dental wear. These traits were characteristic of leprosy which indicated they suffered from the disease. Ultimately, this research demonstrated the wealth of information generated from a dental analysis and deepened our understanding of the lifeways of the population at Ismenion Hill.

Trauma Analysis and Subsistence Transition on the Eastern Eurasian Steppe

Yang, C. (1), Nomokonova, T. (1), Losey, R. (1,2), Kharinskii, A. (3,5), Erdenebattar, D. (4), Portniagin, M. (3), Samdantsoodol, O. (4), Waters-Rist, A. (6) & Lieverse, A. (1)
(1) University of Saskatchewan
(2) University of Alberta
(3) Irkutsk National Research Technical University, Irkutsk, Russia
(4) Ulaanbaatar State University, Ulaanbaatar, Mongolia
(5) Irkutsk State University, Irkutsk, Russia
(6) Western University

Over the past decade, a substantial number of human remains dated to the late Holocene have been excavated from the Lake Baikal region and northern Mongolia. These discoveries offer valuable insights into the lived experiences of ancient pastoral communities through the application of skeletal trauma analysis. Archaeological and anthropological research has highlighted the complexity of pastoralism, which, depending on geographic and temporal contexts, encompasses a range of subsistence strategies, including mobile pastoralism, foraging, and semi-sedentary agropastoralism. The research samples (n = 208) for this study are categorized into three distinct periods and lifeways: 1) Late Bronze-Iron Age (800 BCE to 200 CE) foragers and early pastoralists from the Cis-Baikal; 2) agropastoralists of the Xiongnu Empire (209 BCE to 91 CE) from the Trans-Baikal Ivolga settlement; and 3) mobile pastoralists from both the Xiongnu Empire and the Mongol period (mid-11th to 14th century CE) in northern Mongolia.
Eighty-four of the 208 individuals were deemed observable for analysis. Among these, 56 individuals exhibited evidence of trauma, with no injuries identified among pre-pubescent individuals. Results indicate that incidental (occupational and accidental) injuries were the most prevalent, particularly affecting the vertebrae, while violent trauma was rare. Notably, most violent injuries were observed among the agropastoralists from Ivolga. Incidental trauma was significantly more common among males than females, but no significant sex differences were documented for violent trauma among any of the samples. These findings suggest that the populations of the Baikal region and northern Mongolia were frequently engaged in physically demanding

activities, such as pastoral labour, with conflict rarely impacting their daily lives. However, the occasional presence of violent trauma among agropastoral communities may imply social stratification and exploitation within these groups.