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

52th Annual Meeting

52e Congrès Annuel

Victoria 2025

Welcome to Victoria!

We are pleased to welcome you to the 52nd Annual meeting of the Canadian Association for Biological Anthropology – l'Association canadienne d'anthropologie biologique in beautiful Victoria, BC. We gather on the traditional territory of the Lekwungen-speaking peoples of the Songhees Nation and Xʷsepsəm Nation, and W̱SÁNEĆ peoples, whose historical relationships with the land continue to this day. As you wander around Victoria, look for the Seven Signs of the ləkʷəŋən, seven bronze casts of spindle whorls that mark culturally significant sites for the Songhees Nation and Xʷsepsəm Nation. You can't miss them, as they each stand 2.5 m tall. More information about the meaning of each whorl can be found on the Songhees Nation website or on information plaques at each location. We hope you will find time among the busy conference schedule to take a tour of the downtown core, or beyond.

At last count we have 172 registrations for the conference, with 70 podium and 49 poster presentations and 5 symposia. The student luncheon this year will feature Dr. Keriann McGoogan, presenting *From field to the page: A journey through primatology and science writing*. There are 78 students registered to attend. We gratefully acknowledge Dean Lois Harder and the Faculty of Social Sciences' financial support for the luncheon, as well as financial contributions towards the conference from the President's Office and Department of Anthropology at the University of Victoria, Baseline Archaeological Services Ltd., Sensor and Software Inc., Ecoarc Consulting Ltd., and France Casting. We thank W.W. Norton & Company for their contribution to the raffle prizes.

Thank you as well to our volunteer coordinator, Alexis Brooks, and all the volunteers! The conference would not be possible without you.

CABA-ACAB 2025 Conference Organizing Committee: Stephanie Calce, Ammie Kalan, Sarah-Louise Decrausaz, Marla MacKinnon, Alison Murray, & Helen Kurki

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

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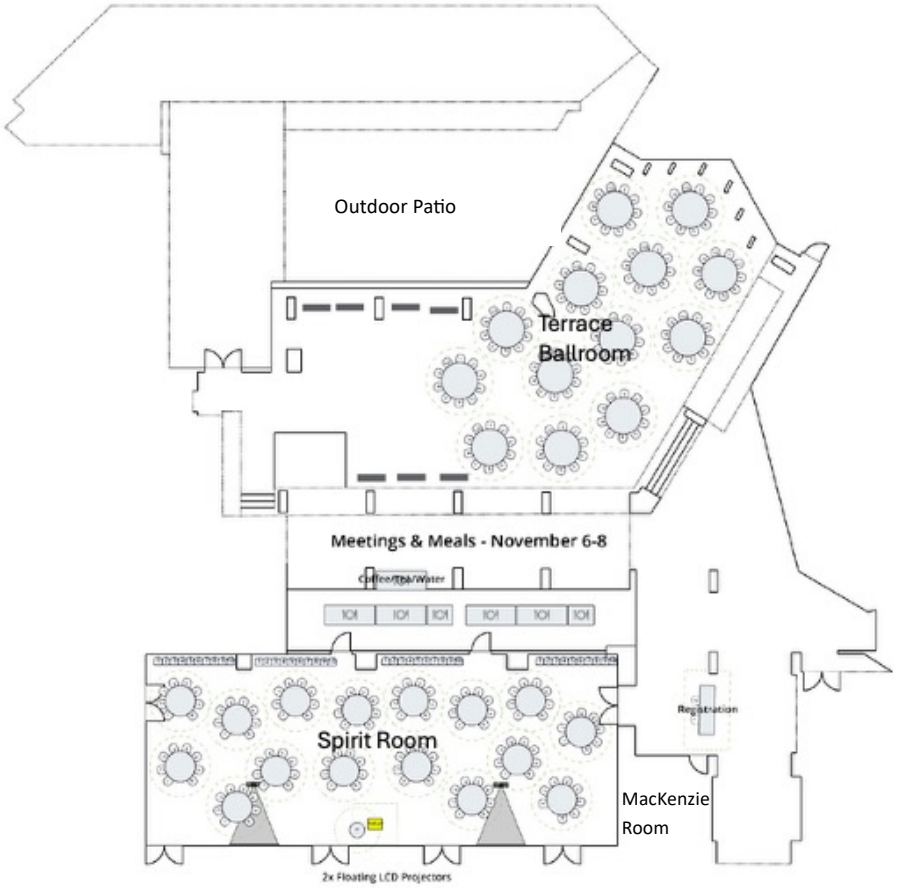

CABA-ACAB 2025 Schedule at a Glance

The podium presentations will be held in the Spirit Rooms and the poster presentations in the Terrace Ballroom.

Wednesday, November 5	
6:00 pm – 9:00 pm	Registration
6:00 pm – 9:00 pm	Welcome Reception (Terrace Ballroom; cash bar)
Thursday, November 6	
7:00 am – 8:00 am	Complimentary Breakfast (Terrace Ballroom)
8:00 am – 4:00 pm	Registration
8:00 am – 5:00 pm	Poster Session 1
8:00 am – 8:15 am	Welcome to the Territory and Opening Remarks
8:15 am – 10:00 am	Podium Session 1: Bioarchaeology
10:00 am – 10:15 am	Coffee Break (Terrace Ballroom)
10:30 am – 12:05 pm	Podium Session 2: Symposium *Primate Flexibility in the Anthropocene*
12:05 pm – 1:30 pm	Student Professional Development Luncheon with talk by Dr. Keriann McGoogan (Spirit Rooms)
1:30 pm – 3:35 pm	Podium Session 3: Symposium *The Messy Middle: The Complexities and Richness that Accompanies Working with Adolescents*
3:35 pm- 3:50 pm	Coffee Break (Terrace Ballroom)
3:50 pm – 5:05 pm	Podium Session 4: Non-Human Primates
6:00 pm – 9:00 pm	Pub Night and Speed Networking Event at Swans Pub (1601 Store Street)
Friday, November 7	
7:00 am – 8:00 am	Complimentary Breakfast (Terrace Ballroom)
8:00 am – 4:00 pm	Registration
8:00 am – 4:00 pm	Poster Session 2
8:00 am – 10:05 am	Podium Session 5: Symposium *Tools, Techniques, and Collaboration: Toward a Biocultural Framework for Locating Unmarked Graves*
10:05 am – 10:20 am	Coffee Break (Terrace Ballroom)
10:05 am – 10:20 am	Curator Get-Together (MacKenzie Room)
10:20am – 11:20 am	Podium Session 6: Symposium *Paleoanthropological Society of Canada* Symposium
11:20 am – 12:05 pm	Podium Session 7: Novel CT Approaches
12:05 pm – 1:30 pm	Lunch
1:30 pm – 3:30 pm	Podium Session 8: Human Biology and Health
3:30 pm – 3:45 pm	Coffee Break (Terrace Ballroom)

3:45 pm – 5:05 pm	Podium Session 9: Symposium *Annealing the Strands: Connecting Ancient DNA Research Across Canada*
5:15 pm – 6:15 pm	CABA-ACAB Business Meeting (Spirit Rooms)
6:30 pm – 7:30 pm	Cocktail Hour (Terrace Ballroom; cash bar)
7:30 pm – 10:00 pm	Banquet (Terrace Ballroom; tickets required; cash bar)
Saturday, November 8	
7:00 am – 8:00 am	Complimentary Breakfast (Terrace Ballroom)
8:00 am – 12:15 pm	Registration
8:00 am – 10:00 am	Podium Session 10: Forensic Anthropology
10:00 am – 10:15 am	Coffee Break (Terrace Ballroom)
10:15 am – 12:00 pm	Podium Session 11: Evolving Ethics & Practices
12:00 pm – 12:15 pm	Closing Remarks, Student Awards, and Elder Send Off

Schedule of Papers and Posters

Thursday November 5th

7:00-8:00 **Complimentary buffet breakfast. Terrace Ballroom**

8:00-5:00 **Poster Session 1. Terrace Ballroom**
Featuring posters from the 'Primate Flexibility in the Anthropocene' invited symposium, Primatology, Medical Anthropology and Health in the Past, and Methods & Approaches. Author will be present for questions during the morning coffee break (even-numbered posters) or the afternoon coffee break (odd-numbered posters).

1. Landry, F. *Fecal proteomics in field/wild primate studies: A test of three extractions methods*.

2. Orkin, J. *Fecal proteomics of wild capuchins reveals impacts of season, diet, age, and sex on gut physiology.*

3. Stroher P. *Research and collaborations in primate genomics across borders*.

4. Bolt, L. *Flexibility in white-faced capuchin monkey (Cebus imitator) feeding ecology across forest edges in an anthropogenically-impacted landscape*.

5. Fox, S. *Kinship dynamics and social integration of adult female chimpanzees in Kibale National Park.*

6. Steffens, T. *Not extinct yet: Mechanisms driving species-area relationships in lemurs*.

7. *Nie, L. *An analysis of the positional behaviour and substrate use of mantled howler monkeys (Alouatta palliata) in an anthropogenically fragmented forest*.

8. *Djevalikian-Couture, N. *Edge and succession effects on spatial cohesion of Endangered blond capuchin monkeys (Sapajus flavius) in a fragment of the Atlantic Forest, Brazil*

9. *Kushniruk, A. *Activity budget of Alouatta palliata and its associated tail and positional posture*

10. *Ura, R. *Stone tool-use rehabilitation for the improvement of releasability and welfare in captive robust capuchins (Sapajus spp.)*

11. *Nakano, R. *The material culture of the accumulative stone throwing behaviour in wild chimpanzees (Pan troglodytes verus)*

12. *Moghrabi, M. *Climate change and habitat fragmentation: Projected distributions of black-horned capuchin (Sapajus nigritus) in Brazil*

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*13. *Joyce, M. Animal disability and behavioural compensation: A systematic review.*

14. Moffat, T. Feeding futures: A biocultural perspective on school food equity and Canada's National School Food Program.

*15. *Chozas-Tanael, I. Theorizing menopause: Simulating the emergence of menopause using the rate of living theory.*

*16. *Li, V. Is maternal agency associated with maternal and child health outcomes in rural Nicaragua?*

17. Uribe de la Rocha, N. Before the Data: From Connection to Refining the Lens in Dominican Republic Food Insecurity Research

*18. *Barlow, N. A consumer's consumption: The effects of the Industrial Revolution on tuberculosis rates.*

*19. *Brooks, A. Observing infectious disease in a Medieval Avar Population: A differential diagnosis.*

*20. *Larrondo, M. Embodied biopolitics and morality in the St. Lawrence County poorhouse.*

*21. *Boorman, C. Steel City: An analysis of the 1918 influenza pandemic and respiratory health in Hamilton, Ontario.*

*22. * Stewart, J. Domain, density, depth, and diameter: A concise method for grading cribra orbitalia in Early Neolithic and Chalcolithic juvenile individuals from the Central Zagros Region*

23. Schillaci, M. Sample size requirements for estimating the population correlation coefficient (ρ): Results from a preliminary analysis using random resampling of variables from Howells data set

24. Gregory-Alcock, G. Human histology in anthropology: A scoping literature review of methods, variables and elements studied

8:00 am-5:05 pm **Podium sessions. Spirit Rooms**
Featuring contributed papers in Bioarchaeology, Non-Human Primates, and Invited Symposia '*Primate Flexibility in the Anthropocene*' and '*The Messy Middle: The Complexities and Richness that Accompanies Working with Adolescents*'

8:00-8:15- Welcome to the Territory from Elder/Knowledge Keeper Norman Garry Sam, and Opening Remarks from the Program Committee

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8:15-10:00 **Podium Session 1- Bioarchaeology**
Chair: Helen Kurki

8:15- **Variability in Early Inuit Dog Diets: Insights from Stable Carbon- and Nitrogen-Isotope Analysis.* Katie Lewis, Western University, ON.
8:30- *Non-human animal dietary proxies to understand local human diet: Guinea pigs in houses in Late Nasca, Peru (450-650 CE).* Aleksa Alaica, University of British Columbia, BC.
8:45- *Are we adequately accounting for diagenetic lead contamination in archaeological skeletal remains?* Rachel Simpson, MacEwan University, AB.
9:00- **Mapping malaria mortality: A spatiotemporal analysis of 19th century Ontario.* Amanda Cooke, McMaster University, Hamilton, ON.
9:15- *Seeing the unseen: Interconnections between social change and burial practice during the Late Chalcolithic period at Kenan Tepe, Turkey.* David Hopwood, Vancouver Island University, BC.
9:30- **Later molar development presents alongside wisdom tooth impaction in post-industrialized English non-adults*. Elsa Van Ankum, University of Saskatchewan, SK.
9:45- (V) *Pregnancy, precarity, and production at a pan grave cemetery in Sheikh Mohamed, Gharb Aswan, Egypt.* Madeleine Mant, St. Lawrence University, USA.

10:00-10:15 **Coffee break. Terrace Ballroom**

10:15-12:05 **Podium Session 2. Symposium- *Primate Flexibility in the Anthropocene.***
Chairs: Ammie Kalan and Travis Steffens

Note: This symposium includes poster presentations 1 through 7 in the Terrace Ballroom.

The greatest threat to wild primates around the globe is the alarming rate of human impact and disturbance to their natural habitats. This symposium aims to bring together primatologists specializing in a diversity of species to examine the varied effects of the Anthropocene on primate flexibility, whether it be behaviour, physiology, or genetic, and to improve our understanding of the ways in which these effects can be mitigated. Secondarily, our aim is to bring together one of the largest contingents of primatologists across Canada in the hopes of initiating a stronger contribution for primatology within CABA for this conference but also moving forward.

10:15- *Exploring the gut ecosystem of wild howler monkeys in pristine versus disturbed habitats using shotgun and 16s sequencing*. Silvia Carboni, University of Calgary, AB.
10:30- *The ARRC Task Force: Improving the mitigation of impacts of large-scale development projects on apes*. Genevieve Campbell, IUCN and Re:wild.
10:45- **Habitat use, behaviour and diet of the critically endangered P. coquereli in a human-modified landscape, northwestern Madagascar*. Coral Chell, University of Toronto, ON.
11:00- *Multi-year patterns of crop foraging in Himalayan Langurs in anthropogenic landscapes: Spatial clustering, shrinking home ranges, and researchers as scapegoats*. Julie Teichroeb, University of Toronto, ON.

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(V) – Virtual presentation

11:15- *Role of Ethiopian Orthodox Church forests in sustaining primates in a changing world.* Ejigu Worku, University of Calgary, AB.
11:30- *Behavioural responses to challenging circumstances: Field research on flexibility in Macaca fuscata and Sapajus spp*. Sarah Turner, Concordia University, QB.
11:45- *Behavioural responses by great apes to anthropogenic landscapes.* Ammie Kalan, University of Victoria, BC.
12:00-12:05- Closing comments from the Chairs

12:05-1:30 **Lunch Break**
12:05-1:30 **Student Luncheon (ticket required). Spirit Rooms**

1:30-3:35 **Podium Session 3. Symposium- *The Messy Middle: The Complexities and Richness that Accompanies Working with Adolescents*.**
Chairs: Sarah Oresnik and L. Creighton Avery

Adolescence is a critical period in the human life course, defined as the physical, mental, and social transition from childhood to adulthood. An understanding of adolescence is important from both a biological and social standpoint. The onset of puberty and the adolescent growth spurt result in the adolescent stage being one of rapid development, with heightened nutritional and energetic demands second to only that of fetal development and infancy. Pubertal development and onset have been closely tied to the sociocultural environment, including social and economic factors, nutritional status, physical exertion, illness, and environment. Ultimately, the physiological transition is not only informed by biological processes, but also distinct local environments, which vary cross-culturally. Adolescent health and well-being are shaped by the conditions and experiences of early life and play a pivotal role in health over the life course. From a social standpoint, adolescents often engage in new activities, form new relationships, and begin making meaningful contributions to their communities. But how adolescence is socially defined, the transition to adulthood, and the socioeconomic roles that accompany it, vary depending on an individual's society, culture, economic status, and gender. While this is a time of physical transition, research into adolescence should view youth as independent actors with their own distinct subculture as opposed to solely viewing adolescents as occupying a transitional space on their way to adulthood. In this session we look beyond the complications that often accompany working with adolescents in biological anthropology and instead consider the possibilities that emerge when we work within this messy middle of the life course. This session invites CABA members from all subdisciplines to think critically on how adolescence is framed in the past and present, by researchers and societies, as well as consider the biosocial variability inherent in this critical life stage.

1:30- **Redefining cultural food: Exploring adolescents' food preferences in Southampton, UK* . Sarah Oresnik. McMaster University, ON.
1:45- **Growing pains: social roles, fracture prevalence, and fracture risk in adolescence.* Meghan Langlois, McMaster University, ON.
2:00- *Molecules in the middle: Studying dental developmental-genetics in non-adult primates.* Julia Boughner, University of Saskatchewan, SK.

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2:15- *_Dental sex estimation equations and their applicability to adolescent/pre-pubescent archaeological skeletal remains (from the Cis-Baikal region)_. Jennifer Laughton, University of Alberta, AB.
2:30- _Puberty as an indicator of biological, social, and neurological changes in Roman Imperial-age Italy._ Creighton Avery, University of Toronto Mississauga, ON.
2:45- _Conservation education of adolescents in Southern Madagascar: Regular conservation club meetings impact expressed learning from field trips_. Amber Walker-Bolton, Red Book Challenge, Conservation Education Madagascar.
3:00- (V) _Towards a biocultural synthesis of adolescence_. Delaney Glass, University of Toronto
3:15- *(V) _From adolescent stage to adolescent process_. Adrianna Wiley, University of Toronto
3:30-3:35- Closing comments from the Chairs

3:35-3:50 **Coffee Break. Terrace Ballroom**

3:50- 5:05 **Podium Session 4. Non-Human Primates**
Chair: Alison Murray

3:50- *_Colobus monkeys in a multilevel society show frequent adult male same-sex sexual behavior with high recurrence and low constraint_. Karyn Anderson, University of Toronto Scarborough, ON.
4:05- *_Evaluating a tool-use rehabilitation protocol for rescued capuchins (Sapajus spp.)_ Viviane Aurora Macedo de Oliveira
4:20- *_Assessing spatial and behavioural risk factors for zoonoses in lemurs_. Marilyn Sheen, University of Guelph, ON.
4:35- *_Comparing magnitudes of morphological integration in the catarrhine ankle and knee._ Sarah Friesen, University of Toronto Mississauga, ON.
4:50- *_Quantifying intraspecific variation in muscle architecture across the primate forelimb._ Ella Macpherson-Hess, University of Calgary, AB.

Friday November 6th

7:00-8:00 **Complimentary buffet breakfast. Terrace Ballroom**

8:00-4:00pm **Poster Session 2.** Featuring posters from the '_Annealing the Strands: Connecting Ancient DNA Research Across Canada_' invited symposium, the _'Paleoanthropological Society of Canada'_ invited symposium, Bioarchaeology, Forensic Anthropology, and Skeletal Biology. Author will be present for questions during the morning coffee break (even-numbered posters) or the afternoon coffee break (odd-numbered posters).

1. *Dixon, E. _Insights into the evolution of vision in early primates: petrosal lobule size in Dryomomys szalayi (late Paleocene, Wyoming)_

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2. *Campeau, H. *Tracing the evolution and global spread of Yersinia pestis using second pandemic European genomes*

3. *Vicente-Sarmento, C-A. *Reassessing gender in Andean mummy bundles: Mortuary practices on the central coast of Peru*

4. *Ward, C. *Disease control or simply pets: Domestic cats as animal technologies used by the Schreiber family*

5. *Yee, J. *Together in Death: A re-evaluation of relationships between the deceased in double burials*

6. *Adams, A. *Beyond the cranium: Investigating porous skeletal lesions on the postcranial skeleton using micro-CT analysis*

7. *Heinrichs, E. *Skeletal dysplasia in an 8th century CE Avar female: A differential diagnosis*

8. *Goodarzi, P. *Childhood growth and health in early farming communities of Central Zagros, Iran: Preliminary observations*

9. *Murray, N. *A comparison of the inferences yielded by three different means of quantifying growth differences in archaeological samples*

10. *Ilkhan, T. *Childhood growth and health in Bronze Age communities of Eastern Iranian plateau, Iran: Preliminary observations*

11. *Morcillo, V. *Dietary changes through isotope analysis ($\delta^{13}C$ and $\delta^{15}N$): The case of the Saint-Just de Valcabrère Necropolis, France (4th to 11th Centuries AD)*

12. Colson, A. *Comparison of activity estimation in two Near Eastern Neolithic sites*

13. Harrington, L. *Evidence for health impacts with pastoralism? Preliminary results from dental imaging and histology of fisher-foragers and herders from the Lake Turkana Basin, Kenya*

14. *Moran, K. *Collagen clues: Dietary differences between Maya and Aztec populations revealed through stable isotopic analysis*

15. Schalburg, J. *From fields to fauna: Isotopic perspectives on Iron Age subsistence at Non Ban Jak, Northeast Thailand*

16. *Mitsunaga, A. *Hunter-gatherers: the original Ostromian society?*

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17. *Dowling, A. *Revitalizing past bioarchaeological projects: Archival work and historical bioarchaeology as a way to shed new light on identities of people from nineteenth-century North America*.

18. *Peplow, M. *Mice as models for human skeletal stress: addressing challenges in bioarchaeological research*

19. *Beardsell, E. *Hurricane Maria: How natural disasters influence cranial development in primates*

20. Schneider, M. *A lemon a day keeps the hemorrhagic lesions away, but what else? Mechanisms underlying ascorbic acid's role in skeletal integrity*.

21. *Lama, C. *Using geometric morphometrics to explore neutral genetic and climate-based models of lower limb variation among Holocene foragers*

22. *Kabirian, M. *Applying fuzzy inference systems to address uncertainty in skeletal sex estimation*

23. *Mula, T. *Establishing forensic thresholds for kerf integrity in burned bone*

24. Ferguson, C. *Addressing the application of evolutionary theory in forensic anthropology: a scoping review*

25. Hartnett, M. *Unraveling debris damage: Comparative analysis with blunt force trauma and thermal damage in forensic anthropological contexts*

26. Kim, S. *Use of pulp/tooth ratio as an age estimation method in older adults*

8:00 am-5:05 pm **Podium sessions. Spirit Rooms**
Featuring contributed papers in Human Biology and Health, Novel Approaches to Reconstructing Life in the Past, and Invited Symposia 'Tools, Techniques, and Collaboration: Toward a Biocultural Framework for Locating Unmarked Graves', 'Paleoanthropological Society of Canada / Société Canadienne de paléoanthropologie', and 'Annealing the Strands: Connecting Ancient DNA Research Across Canada'

8:00-10:05 **Podium Session 5. Symposium- '*Tools, Techniques, and Collaboration: Toward a Biocultural Framework for Locating Unmarked Graves*'**
Chair: Stephanie Calce

Our goal is to bring together those conducting ground surveys in the search for unmarked graves to share the latest technologies, discuss integrative strategies, and foster valuable networking opportunities. We are especially committed to strengthening connections between academic

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institutions, industry professionals, and students. The content will be relevant for those working in the Indian Residential School context and anyone working in historic cemetery contexts, or other burial landscapes more broadly.

8:00- (V) *Mixed methods as a solution to technology fascination bias for unmarked grave prospection*. Derek Congram, Simon Fraser University, BC.
8:15- *Those Remembered & Forgotten: Uncovering the Lost Dead of the Klondike Gold Rush, Archival Research and Beyond*. Nicole Simon, University of Victoria, BC.
8:30- *An Interdisciplinary Approach to Residential School Investigations: The Contribution of Archaeology*. Erin Willows, Millennia Research Limited.
8:45- *Using ground penetrating radar in the search for unmarked graves*. Greg Johnston, Sensors & Software, Inc.
9:00- *Exploring parameters and limitations: soil spectroscopy in burial contexts*. Sara Lefurgey, University of Alberta, AB.
9:15- *Tools, Techniques, and Collaboration: Toward a Biocultural Framework for Locating Unmarked Graves*. Sarah Beaulieu, University of the Fraser Valley, BC.
9:30- *Searching for the missing with historic human remains detection dogs*. Kim Cooper, Ottawa Valley Search and Rescue Dog Association
9:45- *Partnerships, Challenges, and Healing*. Anne Atleo, Ahousaht/Christie Residential Schools Research Project.
10:00-10:05- Closing comments from the Chair

10:05-10:20 **Coffee Break. Terrace Ballroom**
10:05-10:20 **Curator Get-Together. McKenzie Room**

10:20-11:20 **Podium Session 6. Symposium- '*Paleoanthropological Society of Canada / Société Canadienne de paléoanthropologie*'**
Chair: Mirjana Roksandic

Note: This symposium includes poster presentation 1 in the Terrace Ballroom.

Palaeoanthropology is a growing field in the Canadian academic landscape. From its establishment by eight inaugural members in 2015 (at CABA-ACAB meeting in Winnipeg), PASC-SCPA membership has grown to the current 70+ members. Many of our colleagues are successful in both NSERC and SSHRC applications for the work conducted within the PASC-SCPA mandate. The session will present new ideas, new projects and results in palaeoanthropological field and labwork by Canadian researchers and their international partners and students

10:20- *Are ethics in danger of becoming a new gatekeeping tool of neocolonialism in research?* Mirjana Roksandic, University of Winnipeg, MB.
10:35- *Renewed palaeoanthropological research in the Nyabusosi Formation of the Albertine Rift, western Uganda*. Hilary Duke, Capilano University, BC.

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10:50- *Disentangling archaeological herder diets in southern Africa using palaeoproteomics*. Courtneay Hopper, University of Alberta & University of Cape Town, SA.

11:05- **Conservation of tooth and crypt development pattern in extinct and extant primates*. Amalya Babayan, University of Saskatchewan, SK.

Poster presentation

**Insights into the evolution of vision in early primates: Petrosal lobule size in Dryomomys szalayi (late Paleocene, Wyoming)*. Eri Dixon, University of Toronto, ON.

11:20-12:05 **Podium Session 7. Novel Approaches to Reconstructing Life in the Past**
Chair: Helen Kurki

11:20- **Translating 2D funerary taphonomic methods to non-adult mummies*. Hanne Anderson, Western University, ON.

11:35- *Bidinosti, S. *The development of a systematic methodology for digital osteobiographies using computed tomography (CT) scans*

11:50- *Novel methods and applications for the reconstruction of performance from soft-tissue datasets*. Edwin Dickinson, University of Calgary, AB.

12:05-1:30 **Lunch Break**

1:30-3:30 **Podium Session 8- Human Biology and Health**
Chair: Alison Murray

1:30- *Recent lifestyle change impacts sleep and circadian rhythms among the Indigenous peoples of Peninsular Malaysia*. Kathleen Reinhardt, University of Calgary, AB.

1:45- *Birth weight shapes resilience to kidney damage during ultra-endurance exercise*. Alison Murray, University of Victoria, BC.

2:00- *Evaluating bone density in patients with peripheral nerve injury*. Karyne Rabey, University of Alberta, AB.

2:15- **Male-female differences in bone healing with exercise*. Nikala Bochinski, University of Alberta, AB.

2:30- **Dairy consumption and despair: Age and sex differentials of a persistent fever in the Maltese islands*. Sebastian Marto Granata, Trent University, ON.

2:45- **Maternal subjective social status in rural Nicaragua: A mixed-methods analysis of cultural and economic factors*. Amanda Seyler, University of Calgary, AB.

3:00- **"When I transitioned into adult care, the team was gone!": Exploring the Gaps in the Transition to Adult Care for People Living with Rare Diseases*. Dima Kassem, Western University, ON.

3:15- **Colonized Cradles: The Infant Welfare Movement across British Colonies in the 20th Century*. Maha Mian, Trent University.

*Student prize competition
(V) – Virtual presentation

3:30-3:45 **Coffee Break. Terrace Ballroom**

3:45- 5:05 **Podium Session 9. Symposium-*Annealing the Strands: Connecting Ancient DNA Research Across Canada***
Chairs: Cathy Tran and Luca Del Giacco

Note: This symposium includes poster presentation 2 in the Terrace Ballroom

Over the past few decades, the advancement of genetic techniques have allowed for the analysis of complicated DNA samples, including degraded ancient DNA. Since then, ancient DNA (aDNA) has served as a tool to explore both novel and previously unanswered questions in various disciplines, including biological anthropology. In Canada, ancient DNA continues to contribute significant perspectives and expand the toolkit of biological anthropologists. This symposium aims to showcase the valuable insights of ancient genetics by highlighting the growing contributions of ancient DNA research to biological anthropology across Canada. With only a couple of dedicated aDNA laboratories in Canada and even fewer focusing on biological anthropology, there are limited dedicated spaces that allow aDNA researchers to connect with one another. By designing a dedicated symposium, our goal is for aDNA researchers to both share their work and learn more about one another's research, in order to build a greater aDNA community in Canadian biological anthropology. To foster these connections, we intend to invite presenters from institutions across Canada. In particular, we aim to include researchers who are conducting aDNA research, but may not be a member of a dedicated aDNA laboratory. With this symposium, we hope to encourage: (A) non-aDNA researchers to consider the value of integrating aDNA to answer their research questions; and (B) aDNA researchers to collaborate with one another to conduct more insightful research.

3:45- *Recent advances in Canadian Quaternary palaeoecology inferred through cutting-edge metagenomics from diverse sample types.* Chris Hebda, Hakai Institute, BC
4:00- *First steps: methodologies to recover methylation patterns from human bone samples.* Natassja Brien, McMaster University, ON.
4:15- *Archaeogenetic insight into the origin of syphilis and other treponemal diseases*. Casey Kirkpatrick, Simon Fraser University, BC.
4:30- *Engaging Students in Ancient DNA Detection*. Jessica Hider, McMaster University, ON.
4:45- (V) *Archaic adaptive introgression in modern human reproductive genes.* Chris Kendall, University of Toronto & The Hospital for Sick Children, ON.
5:00-5:05- Closing comments from the Chairs

Poster presentation:
* *Tracing the evolution and global spread of Yersinia pestis using second pandemic European genomes*. Hannah Campeau, McMaster University, ON.

5:15 Business Meeting. Spirit Rooms
6:30 Cocktail Hour. Terrace Ballroom
7:30 Banquet (tickets required, cash bar). Terrace Ballroom

*Student prize competition
(V) – Virtual presentation

Saturday November 8th

7:00-8:00 **Complimentary buffet breakfast**. **Terrace Ballroom**

8:00-12:00 **Podium sessions. Spirit Rooms**
Featuring contributed papers in Forensic Anthropology and Evolving Ethics & Practices.

8:00- 10:00 **Podium Session 10- Forensic Anthropology**
Chair: Stephanie Calce

8:00- **Correct, Partly Correct, and Incorrect: Assessing Patterns of Utility for an Age Estimation Method using only the Retroauricular Area of the Ilium*. Elena Sierra-Serrano, Simon Fraser University, BC.
8:15- **Evaluating the effectiveness of talar geometric morphometrics for sex estimation in a South African population*. Lucky Ubulu, University of Cape Town, SA.
8:30- **In obtaining population-specific data for sex estimation, how reliable is the use of three-dimensional computed tomography (3DCT)? A study conducted on the humerus of South African Blacks (SABs)*. Oriasotie Ujaddughe, University of the Witswatersrand, SA.
8:45- **Standards Don't Apply: Impacts of Context-Specific Preservation on Methods of Sex Determination for Recovered First and Second World War Soldier Remains*. Cameron Scott, University of Manitoba, MB.
9:00- *Good Fences Make Good Neighbours: Skeletal Differences Between Canadians and Americans in FORDISC 3.0*. Elisabeth Cuerrier-Richer, Université du Québec à Trois-Rivières, QB.
9:15- (V) **Assessing the reproducibility and forensic utility of the Wright and Vásquez (2003) method for estimating long bone length from fragmented femora*. Tianna Confitti, Trent University, ON.
9:30- (V) *Understanding natural mummification: innovative electronic sensors for quantifying soft tissue drying in forensic taphonomy*. Kara Adams, University of Cape Town, SA.
9:45- (V) **Evaluating the reproducibility and utility of a stature estimation method using fragmented humeri*. Hayley Kupko, University of Windsor, ON.

10:00-10:15 **Coffee Break. Terrace Ballroom**

10:15-12:00 **Podium Session 11- Evolving Ethics and Practices**
Chair: Michelle Cameron

10:15- *Restitution in practice: Reflections on the Medicine Hat Ancestors Reburial Project*. Tonya Simpson, University of Alberta, AB.
10:30- *A secondary issue: examining secondary data analysis, research ethics, and current practices in Southern African bioarchaeology*. Michelle Cameron, University of Toronto, ON.
10:45- **A human rights perspective on collections of purchased human skeletal remains*. Katya Godwin, University of Manitoba, MB.

*Student prize competition
(V) – Virtual presentation

11:00- **“My ancestors are dancing”: Theorizing self-identities, biological affinities, and inheritance in the 21st century using Two-Eyed Seeing*. Sadie Tremblay, University of Alberta, AB.

11:15- *Decision-making in bioarchaeological research design: Reflections from a multi-step, team project.* Elizabeth Sawchuk, Cleveland Museum of Natural History, USA & University of Alberta, AB.

11:30- *How do we care for our human skeletal remains? Starting the collaborative conversation*. Kathryn Waterhouse, Camosun College, BC.

11:45- *Cultural protocols and biomolecular tools: Exploring the use of ZooMS for Ancestral Remains identification*. Camilla Speller, University of British Columbia, BC.

12:00 **Student awards presentation & closing remarks from Elder/Knowledge Keeper Norman Garry Sam and Program Committee**

*Student prize competition
(V) – Virtual presentation

Abstract Book

Beyond the cranium: Investigating porous skeletal lesions on the postcranial skeleton using micro-CT analysis

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In paleopathology, porous skeletal lesions (PSLs) are often attributed to marrow hyperplasia associated with childhood anemia. Marrow hyperplasia occurs when red blood cell production fails to meet oxygen demand (anemia), leading to an increase in hematopoietic tissue (red marrow). The described internal skeletal changes associated with accommodating the new volume of bone marrow include increased trabecular separation (TbSp), trabecular thinning (TbTh), and cortical thinning (CtTh). At sites with thin cortical bone, reabsorption can occur, resulting in porous lesions. The etiology of post-cranial lesions is understudied compared to cranial lesions. Here, we examine the internal microarchitecture (TbSp, TbTh, and CtTh) of humeral and femoral necks to assess evidence of internal marrow space changes consistent with marrow hyperplasia in 60 non-adult individuals (ages 5 months–18 years) from six archaeological sites: Arnhem (1650–1829 CE, n = 18), Eindhoven (1650–1850 CE, n = 3), Alkmaar (1716–1830 CE, n = 13), Zwolle (1675–1828 CE, n = 3), Pointe-aux-Trembles (1709–1843 CE, n = 9), and St. Antoine (1799–1854 CE, n = 14). Micro-computed tomography (micro-CT) scans of 56 femora and 13 humeri, 32 with and 28 without PSLs, were examined. Microarchitectural measurements of the average CtTh, TbSp, and TbSp were taken using Dragonfly (v.2021.4) software to evaluate evidence of marrow hyperplasia. We found that the presence of PSLs is not consistently associated with increased trabecular separation, suggesting that PSLs alone are insufficient to indicate cases of anemia. Normal growth is unlikely to be an explanation, as preliminary results indicate that, unlike cortical and trabecular thickness, there is no significant linear relationship between age and average trabecular separation in the humeri or femora, indicating minimal variation across age groups. Other conditions and pathological processes likely contribute to PSLs, and further research is required on the range of potential causes.

Understanding natural mummification: Innovative electronic sensors for quantifying soft tissue drying in forensic taphonomy

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Precocious mummification is a unique phenomenon in Cape Town and is described as full-body desiccation occurring in less than one month. This research investigates the desiccation process of soft tissue in South Africa, examining its interplay with environmental factors and its implications for estimating the post-mortem interval (PMI). Across two summer seasons and one winter season, four decomposing porcine bodies were deployed. Custom-designed and constructed printed circuit boards (PCBs) were created and used to quantify desiccation patterns by measuring the moisture content of body tissue over time. Three PCBs were inserted in each porcine body and resistivity measures were collected every 15 minutes. Generalized additive models (GAM) were employed to identify the environmental factors influencing desiccation. Tissue resistivity was assessed against environmental variables (accumulated degree days, solar radiation, precipitation, and humidity) to gauge the extent of variation in tissue resistivity these variables explain. The findings reveal distinct desiccation trajectories between summer and winter, with summer conditions fostering precocious mummification, while winter conditions did not. Environmental factors, notably temperature and solar radiation, emerged as significant influencers of desiccation. This study represents the first quantitative analysis of deep tissue desiccation on an international scale, as well as the first quantitative evaluation of desiccation and natural precocious mummification in the Western Cape, South Africa. The results show promise for informing local PMI estimates in medico-legal death investigations. Moreover, the technology and methodology developed for this study demonstrates the value of a transdisciplinary approach to investigating and understanding complex, applied problems in forensics.

Non-human animal dietary proxies to understand local human diet: Guinea pigs in houses in Late Nasca, Peru (450-650 CE)

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Human dietary trends have been examined directly from human burials using isotope analyses. With mortuary patterns differing dependent on community affiliation and origin, often local diet remains elusive because without investigating origin of human burials through strontium isotope analyses, heterogeneity in human diet can be erroneously related to non-local origin. In this paper, we propose that for the ancient Andes, the widespread practice of guinea pig husbandry in

domestic contexts provides a key opportunity to query human dietary patterns. We present stable isotope analyses on guinea pig remains recovered from domestic contexts at the site of Cocahuischo. This is a Late Nasca (450-650 CE) settlement with 471 structures. We consider the range of stable isotope results by household and propose that guinea pigs can serve as household proxies for human diet from the main plant species being consumed in domestic spaces. We implore other scholars working in the region on bioarchaeological dietary and mobility research questions to consider analyzing guinea pig remains in tandem with human remains, if not before, so as to finetune dietary interpretations and minimize the impact of destructive techniques of human ancestors in the region.

Translating 2D funerary taphonomic methods to nonadult mummies

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The “Mummies as Microcosms” project aims to use non-destructive and minimally invasive techniques such as x-ray and CT imaging to understand how Peruvian fardos (mummy bundles) demonstrate the biological and cultural identity of the individual under study. Fardos were part of a funerary custom in ancient Peru where individuals were bundled with objects (food, shells, etc.), wrapped in textiles and then buried in the sand. The environmental conditions paired with the textile wrappings led to mummification of the individual’s body and preservation of the hair, skin, and nails. There are many taphonomic processes which determine the degree of preservation of the remains after death. In 2022, Dr. Jo Motley aimed to understand the taphonomic processes that affected the remains in fardos on the Central Coast of Peru. Motley (2022) developed a completeness and articulation index to objectively measure preservation to enable more meaningful comparisons of these patterns cross-culturally and temporally. Motley (2022) demonstrated that adults on the Central Coast of ancient Peru received delayed burial treatments where they were left to partially decompose before burial. However, nonadults were not considered and this index cannot be directly applied to nonadults as it does not account for the changes they go through during growth and development. This paper adapts Motley’s (2022) index and applies the new method to nonadult mummies from the Central Coast of Peru, considering how non-destructive imaging technology enables us to study these taphonomic processes in an ethical and culturally informed manner. My goal is to identify if nonadults received similar burial treatments to adults, specifically if they received delayed burials as well.

Colobus monkeys in a multilevel society show frequent adult male same-sex sexual behavior with high recurrence and low constraint

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The study of same-sex sexual behavior (SSB) has gained some attention in recent years, allowing us to reconsider our understandings of its evolution and adaptive value. Recent work has suggested expanding the definition of SSB to include courtship, pair-bonding, and other contextual information. Considering SSB within its behavioral context allows us to not only get at the function of SSB but also compare sequences of same-sex sexual behavior to different-sex sexual behavior. Using temporal pattern analysis (TPA), we compared behavioral patterns of same-sex (SSB) and different-sex sexual behavior (DSB) in Rwenzori Angolan colobus monkeys (Colobus angolensis ruwenzorii). Over 6 months, we observed 82 sequences of sexual behavior, with 21% of these (N = 17) occurring between same-sex individuals. While rates of DSB were higher than SSB, their expression amongst age-sex classes trended similarly. Compared to closely related species, Rwenzori Angolan colobus engage in higher rates of SSB at older ages. TPA revealed that SSB and DSB patterns were similar, but patterns repeated more frequently for SSB than DSB. Our results suggest that SSB could be functional in Rwenzori colobus. We suggest that SSB amongst adult males in this subspecies may be adaptive if it promotes male social bonding within their multi-level society where more than half of the core units are multi-male, multi-female.

Partnerships, challenges, and healing

Atleo, A (1)
1. Ahousaht/Christie Residential Schools Research Project

Our team was given two mandates by our leadership: *to find missing children and to be a catalyst for healing*. Each carries distinct challenges and requires collaboration with diverse partners. In this presentation, I will share our experiences as we work to locate children who were residents at the Ahousaht Indian Residential School and the Christie Indian Residential School. Partnerships have been central to our work. Our team includes an archival specialist reviewing thousands of historical documents; an oral historian recording the experiences of former students; geophysical and archaeological specialists conducting surveys; a cultural team, an advisory committee, hereditary and elected community leadership, and members of the Provincial Technical Working Group. Equally vital is dedicated wellness support, ensuring that we can process the painful histories we encounter each week and care for our thlimaaks'tii—our innermost being. We face significant challenges. Technical limitations arise when tools designed for open fields do not work well in our dense forests, coastal soils, or submerged landscapes such as the lake at Christie. Cultural challenges emerge as we revisit wounds long covered but not healed. Testimonies are essential, yet we must proceed with care to avoid re-traumatization. Archival records are often incomplete, illegible, or redacted. DNA analysis is not included in Canada's mandate, and funding for both research and healing remains short-term and inadequate. Access to church records is further

complicated by their dispersal across multiple repositories. Despite these barriers, the work is advancing. Healing that takes place within Ahousaht is not limited to our community; it contributes to truth, recognition, and reconciliation for all the communities from where the children came and for British Columbia and Canada as a whole.

Puberty as an indicator of biological, social, and neurological changes in Roman Imperial-age Italy

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Puberty is typically viewed as a biological process, but it also serves as a marker of social age in many contexts, as individuals transition from socially constructed categories of childhood to adulthood. Recent clinical research has also demonstrated that puberty initiates a wide range of neurological changes, resulting in changes in behaviours and patterns of thinking. The current research examines sex-specific patterns of pubertal timing in Roman Velia (1st-2nd century CE), to better understand the timing of these biological transitions, and possible implications for social and neurological changes in the Roman Empire. To assess pubertal timing at Velia, osteological age and sex estimates were completed, including peptide analysis of amelogenin to assess biological sex in pre- and peri-pubertal individuals, and assessment of pubertal-stage-at-death based on eight osteological features. All individuals aged 8 to 25 with at least three indicators of pubertal timing were included in the analysis, resulting in a sample size of 29 individuals (12 males and 17 females). Results demonstrate that males experienced the adolescent growth spurt between approximately 13 and 16 years of age, while females experienced the adolescent growth spurt between 14 and 16 years of age and menarche around the age of 16. Incorporation of ancient literary records demonstrates the interconnectedness of the biological, neurological, and expected social age changes for males in the Roman life course model. For females, however, there appears to be a disconnected between the biological/neurological changes and expected social age changes, contributing to a messy middle for females, but perhaps a less messy middle for males in Roman Velia.

Conservation of tooth and crypt development pattern in extinct and extant primates

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Studying how hominoid teeth and jaws are integrated during their development reveals key insights about the evolution of primate faces. Often, developing teeth are also unerupted teeth, still within the jaws, and can only be studied in younger, rarer specimens of non-adult primates. Hence, we took a non-invasive approach to visualize and describe mineralizing teeth and their expanding crypts within the jawbone. Our exploratory and descriptive study asked whether crypt morphology can serve as a proxy for tooth crown and root mineralization stage. Our samples consisted of computed tomography scans of fossilized upper or lower jaw fragments from n=3 Homo sp. and n=6 Paranthropus robustus (2.04-1.95mya) immature individuals, and n=16 free-lived gibbons (Hylobates lar carpenteri) ranging from infants (n=10) to juveniles (n=6). We staged tooth development, encompassing tooth initiation (stage 1) to root apical closure (stage 12), and described crypt form and position relative to the tooth within, and relative to neighbouring crypts. We found that for all teeth studied corresponding crypts were more spacious and spherical before crown completion (stage 7). As roots developed (stages 8-11), crypt space around the tooth shrank, and crypt shape traced tooth shape and orientation more closely. Regardless of tooth class (e.g., canines, incisors, molars), adjacent tooth crypts were often interconnected by even a small opening in the crypt bony wall shared between teeth. Also, gubernacular canals persisted throughout much of tooth formation (stages 2-8). Patterns of crypt and tooth development, morphology, and position were consistent among fossil hominins and gibbons. Altogether, our results suggest that the fundamental processes by which the crypts and teeth develop and fit within the jawbone are consistent and conserved across hominoids. Our study also supports further and more systematic investigation of crypts as reliable proxies for tooth development.

A consumer's consumption: The effects of the Industrial Revolution on tuberculosis rates

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Tuberculosis (TB) is transmitted aerobically and one of the world's deadliest infectious diseases, according to the World Health Organization website, despite being preventable and treatable. In Canada, there are still hundreds of active cases of TB each year. This study examines TB prevalence around in the world, to explore potential differences in the quality of life before and after the industrial revolution. Fifteen previously published papers examining TB from multiple sites across Eurasia, North America and South America (n= 28,165 individuals) were analyzed. From these studies, crude prevalence was documented and the frequency of TB pre- and post-industrial revolution for each continental group was calculated. Chi square was calculated based on these frequencies. Results demonstrate that differences in TB rates were statistically significant in Eurasia ($x2=14.792$, $p=0.0001$, $df=1$) with a decline in frequency of TB cases. Differences in North

America (x2=1.361, p= 0.2433, df=1) and South America (x2= 0.243, p= 0.6223, df=1) had a decrease and increase in TB cases respectively; however, they were both found to be statistically insignificant. These results show that there was a significant decrease in rates of TB in Eurasia, suggesting an improvement in health conditions and quality of life after the industrial revolution in this area of the world. Although it is well documented that city centres in industrial Eurasia dealt with conditions which should have acerbated TB rates (dense population, living/working in buildings with poor lighting and ventilation, etc.), according to the data, this is not the pattern being presented. This challenges previous assumptions about industrial Eurasia and suggests a potential link between changes in TB rates and the industrial revolution.

Hurricane Maria: How natural disasters influence cranial development in primates

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In 2019, Hurricane Maria travelled through the Caribbean, dramatically impacting the island of Cayo Santiago and disturbing the large free-ranging rhesus macaque (Macaca mulatta) populations found there. Such environmental catastrophes have been previously documented to exacerbate incidences and magnitudes of fluctuating asymmetry (FA), or random deviations of asymmetry, within impacted populations by disrupting typical physiological processes of growth and maintenance. This study investigates FA across modules of the cranium and mandible modules within predominantly low-ranked social groups of rhesus macaques. Our sample size included 165 individuals (163 crania; 154 mandibles, predominantly pair-matched) to investigate trends relating to demography and modularity in the manifestation of FA. Using bilateral and midline landmarks across the crania and mandible, we applied a generalized Procrustes analysis followed by a Procrustes ANOVA. Our analysis found a strong modular effect on FA, particularly within the mandible. Age of death also impacted FA, with individuals with longer lifespans expressing higher levels of FA. However, we found no significant impact of hurricane experience: individuals that died prior to Hurricane Maria had statistically indistinguishable FA scores to those that lived through the event. These results indicate that there are strong modular differences in where FA manifests within the craniomandibular complex of nonhuman primates, as well as highlighting a potential increase in FA magnitudes throughout life.

Tools, techniques, and collaboration: Toward a biocultural framework for locating unmarked graves

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Collaboration plays a crucial role in the search for unmarked graves, particularly those tied to Canada's former Indian Residential Schools. It facilitates the exchange of knowledge, resources, and approaches led by the community, all while honoring Indigenous rights and self-determination. This collective effort brings together Indigenous communities, Survivors, Elders, governments, and researchers, who work side by side to share information, use technologies like ground-penetrating radar and search dogs, conduct archival research, hold interviews with survivors, and provide support for community healing and respectful handling of any discoveries.

Dr. Beaulieu's search efforts have prominently featured remote sensing technologies and the use of historic human remains detection dogs. Understanding and interpreting the various environmental conditions and landscapes is key to making informed decisions on which technologies are best suited for each specific search site. Ultimately, this process relies on collaboration and the exchange of knowledge to help bring closure to communities that have endured the painful legacies of this historical injustice.

The development of a systematic methodology for digital osteobiographies using computed tomography (CT) scans

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This research establishes a systematic methodology that adapts dry bone techniques commonly used in skeletal analysis for the computed tomographic (CT) environment, as well as develops radiography-specific methods that enhance these dry bone techniques, for the assessment of age-at-death, biological sex, and cranial and post-cranial measurements. The study explores the limitations and advantages of applying CT scans to skeletal analysis to identify the best protocols for acquiring accurate and reliable results for multidisciplinary use. Osteomorphometric methods are routinely used to measure and analyze skeletonized human remains. While established, standard literature guides age, sex, and stature estimations of skeletonized material, a gap existed in adapting these methods for the virtual realm of CT scans. In the absence of a systematic approach, previous studies have applied osteomorphometric methods to CT scans in an ad hoc manner. This research focused on developing a systematic CT methodology by testing the application of traditional methods on clinical CT scans and their corresponding physical bones (cranium, pelvis, humerus, and femur). It examined how well the methods performed in a digital context, how to adjust existing techniques for CT application, and what additional capabilities CT offers for analyzing skeletal features necessary for predicting age, sex, and body size. This analysis was not aimed at testing how accurately traditional techniques predict age, sex, and stature, but rather how accurately the digital representations reflect the features on physical bones needed for these estimations. This study demonstrates that virtual models from CT scans will never exactly match what can be observed and measured on dry bones, but that the approach outlined here can

produce comparable results, with an understanding of the need to avoid false precision. As research moves toward being increasingly non-destructive and non-invasive, this work provides a benchmark for the expanding field of bioarchaeological investigations using CT scans.

Male-female differences in bone healing with exercise

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Sex-specific differences in bone physiology arise from hormonal regulation, mechanical loading, and metabolic factors. These distinctions influence not only bone structure and health, but also how bone adapts and heals after injury. Exercise further shapes bone in sex-specific ways, engaging distinct pathways in males and females. When bone health is disrupted by nerve injury, these interactions become even more complex. Understanding these sex-specific differences is critical, as they may influence long-term outcomes and guide the development of targeted therapies. The objective of this work is therefore to determine whether male and female mice exhibit divergent patterns of bone recovery following nerve injury. A total of 40 wild-type mice (20 males, 20 females) were evenly divided into control and exercise groups within each sex, and half of the animals underwent a sciatic nerve cut and repair surgery. The tibiae were harvested, scanned using micro-CT at 9 μm resolution. All data were analyzed using analysis of variance (ANOVA) with experimental groups and sex as independent factors (p

Flexibility in white-faced capuchin monkey (*Cebus imitator*) feeding ecology across forest edges in an anthropogenically-impacted landscape

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Anthropogenic forest fragmentation impacts many aspects of animal behaviour, including feeding ecology. Deforestation due to human development causes edge effects, with edge areas (≤100 m from deforested regions) differing in vegetation structure. As deforestation increases in tropical areas worldwide, it is vital to better understand how these forest changes may impact animal

feeding. While many animals are negatively impacted by anthropogenic landscape alteration, some dietary generalists such as white-faced capuchin monkeys (*Cebus imitator*) prefer forest edge. In order to investigate whether food availability may be influencing capuchin edge preferences, we surveyed capuchin monkey feeding behaviour across forest zones in a fragmented rainforest in Costa Rica, La Suerte Biological Research Station (LSBRS). Based on previous research at LSBRS indicating both capuchin edge preferences and the prevalence of fruit in forest edge, we predicted that capuchins would spend more time feeding, feed on higher-quality food resources like fruit, and from a larger number of plant families in forest edge. Based on differences in overall vegetation structure at the site, we also predicted that capuchins would feed from smaller trees in forest edge compared to interior. We collected data from 2017-2025 at LSBRS and observed individual monkeys for 30-minute periods, recording their feeding behaviour and tree use at 2-min intervals. We measured feeding trees and noted the feeding items and taxonomy of resources consumed. Although monkeys did not differ in feeding time allocation across edge and interior ($p=0.29$), monkeys fed from shorter trees ($p=0.007$) and consumed more fruit but fed from fewer plant families than expected in forest edge ($p<0.001$) compared to forest interior. Our results indicate differences in capuchin feeding behaviour across forest zones, attesting to the impact of human disturbance on monkey feeding and suggesting that capuchin dietary adaptations and behavioural flexibility may drive their preference for anthropogenic edge.

Steel City: An analysis of the 1918 influenza pandemic and respiratory health in Hamilton, Ontario

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When understanding population health, especially in the context of pandemics, considering social, environmental, and biological implications is crucial to gain holistic perspectives. Factors such as exposure rates and susceptibility, which can be influenced by one's social and physical environment, play a key role in health and pandemic variation among populations. This research aims to understand such varying pandemic experiences across city wards regarding the 1918 influenza pandemic in Hamilton, Ontario. Through exploring the influence of air pollution on health, a continuous issue faced by the Industrial Sector, this research investigates the environments of those living in Hamilton particularly during the pandemic, and asks: were people living in the Industrial Sector more likely to die of respiratory complications during the 1918 influenza? This study was conducted through the collection and analysis of approximately 20% of death certificates from a non-pandemic (1916) and a pandemic (1918) year. Supplementary sources such as archival records and available literature were also used to examine a potential link between poor respiratory health and mortality within the Industrial Sector during the pandemic.

Social influences such as socioeconomic status, housing quality, and lifestyle, along with environmental and biological aspects such as the immunological effects of prolonged exposure to particulate matter (PM), were among the main factors analysed. This research holds potential for future studies surrounding historical and contemporary health regarding Hamilton's Industrial Sector. This study indicates patterns of mortality across the city's wards during the early 1900s and provides insight into determinants of health as linked to social, environmental, and biological influences. Events such as the 1918 influenza help to reveal such patterns in a population, and are valuable when analysing population health.

Molecules in the middle: Studying dental developmental-genetics in non-adult primates

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Tooth development (odontogenesis) is a deeply conserved process across vertebrates. In primates this deep developmental-genetic conservation appears to encompass all dentitions and tooth classes. Primates are unusually slow in their dental development. While deciduous teeth and at least one permanent tooth start developing in utero, many permanent teeth initiate only after birth. Some teeth form over long postnatal periods (e.g., years). Depending on the species, odontogenesis may span a majority of a primate's non-adult life including adolescence. Longer periods of growth, varied paces of odontogenesis, and variations in diet paralleled by morphological specializations all present opportunities to study the gene, cell and tissue dynamics underpinning dental evolution and development (evo-devo). Parsing the mechanisms that drive the formation of one tooth is non-trivial; yet studying tooth evo-devo requires datapoints for up to nine teeth in one dentition (e.g., permanent), depending on a species' dental formula. Each tooth datapoint may yield numerous other datapoints, e.g., up to 12 scores for crypt, crown and root formation. Beyond studies of tooth developmental morphology, evo-devo anthropologists analyze the myriad molecules directing odontogenesis. These gene transcripts and protein products orchestrate the initiation of a tooth organ, the conception and expansion of its surrounding bony crypt, and/or the forms of the mineralizing crown and root(s). All to say: most of the good toothy action happens in infants to older juveniles, including adolescents. Compared to adults, these younger ages are more challenging to sample, in any large number that allows robust biological replicates to study multiple genes, in multiple tooth types, in multiple planes of section, in deciduous and replacement dentitions. This talk takes a 'meta' approach with gene expression and morphological data for gibbons, monkeys, lemurs, and humans to narrate the challenges and opportunities in doing comparative studies of dental development in young primates.

First steps: Methodologies to recover methylation patterns from human bone samples

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Bioarchaeologists are deeply interested in how lived experiences impact the body, using analysis of macroscopic and microscopic bone changes along with multiple other methods to learn more about lives lived in the past. Bone is particularly useful for these analyses because it is affected by lived experiences and also often survives to the present day, but additional analyses are helpful in adding to the overall picture. Evidence suggests that lived experiences also impact the epigenome, the layers of chemical changes that affect the way our genes function, in ways that we can examine in the present-day. However, few attempts have been made to recover this information in a bioarchaeological context, creating a methodological research gap. My research aims to explore the epigenome as a source of information on lived experiences in the past, beginning with benchmarking different methods to determine which is most suitable for an ancient DNA context. Bisulfite treatment is the gold standard in modern epigenetic studies, but has only been applied sparingly in ancient DNA due to concerns about further loss of information from an already limited and finite source. Recently interest has been renewed in the application of bisulfite treatments due to its ability to provide high-resolution and direct measurement of methylation, in contrast to inference-based methods. This study compares four different bisulfite treatment methods and their effect on ancient DNA extracts of varying preservation levels, to explore the feasibility of using bisulfite treatment more widely in the study of ancient methylation patterns. Future directions for this research include analyzing epigenomes of people in the past to better estimate age in adults, understand risk factors for osteoporosis, and potentially infer experiences of stress.

Observing infectious disease in a Medieval Avar population: A differential diagnosis

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The Avar people were a 6th-9th century, semi-nomadic population from medieval Eurasia who migrated from the Eastern Asian Steppes to Eastern Central European countries including Hungary and Austria. This presentation examines patterns of tuberculosis and brucellosis in the Avar population in what is present-day Austria. This involved osteological analysis complemented by radiographic and photographic images from individuals selected from the Hirschstetten and Bruckneudorf cemeteries. Based on this information, a) the probability of an individual having had tuberculosis was calculated by integrating lesions sensitivity and specificity estimates; b) differential diagnosis was used to distinguish between tuberculosis and possible cases of

brucellosis; and c) site differences in the indicators for these two diseases were evaluated. Results identified that 64.8% of the individuals had a probable diagnosis of tuberculosis, 7.4% of the individuals had possible cases of tuberculosis, and 7.4% of the individuals having likely cases of brucellosis. This investigation adds further to our understanding of the Avar populations and their experience with tuberculosis and brucellosis.

A collaborative model for biological anthropologists working in grave investigations

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Searching for and excavating marked and unmarked gravesites is rarely straightforward. Markers can be lost to time from natural erosion, or removed intentionally to obscure their presence. Relying on a single line of evidence risks incomplete or misleading results. This presentation demonstrates how best practices emerge when multiple approaches—archival research, community knowledge, archaeological excavation, geophysical survey, and osteological analysis—are brought together in a coordinated way. The strength of this method lies not only in the overlap of data but also in the collaborative environment it creates, bridging specialized skill sets that are too often siloed. By highlighting two recent field projects, including work at the Spirit Lake Internment Camp Cemetery (DdGn-1) in Québec, this presentation will show how interdisciplinary collaboration leads to clearer results, stronger interpretations, and more ethically grounded outcomes. For biological anthropologists, this approach offers valuable insight into how merging expertise and perspectives can transform the challenges of identifying both marked and unmarked graves into opportunities for best practice.

A secondary issue: Examining secondary data analysis, research ethics, and current practices in Southern African bioarchaeology

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There are ongoing discussions around how bioarchaeologists engage with the Ancestors of contemporary Indigenous peoples arising from the fraught history of biological anthropology and the field’s role in marginalizing and othering Indigenous peoples. These discussions pertain to many international Indigenous communities, including contemporary San and/or Khoe peoples in Southern Africa. Recently, there have been greater conversations around the decision-making processes involved in how human remains recovered from archaeological contexts in Southern Africa are studied. Ancestral San and/or Khoe individuals housed in institutional settings may be exposed to risks, including the risk of damage during the research process. In other contexts, these risks have been minimized through several strategies, including retiring Ancestors from

investigation to bolstering community collaboration practices to ensure descendant communities drive research decision-making. Researchers seeking to minimize these risks but still interested in studying Ancestral San and/or Khoe individuals may instead prioritize secondary data analysis, where previously collected or published information is the focus of investigation. However, secondary data analysis is not without issue, as data sharing procedures may vary among researchers and across institutions, and project design may not involve descendant communities. Investigating how secondary data analysis can be performed in ways that meet the needs of descendant communities is secondary to more pressing issues. However, conversations with all stakeholders may provide a starting point for imagining new ways to conduct bioarchaeological research in Southern Africa and other contexts and allow for best future practices to be identified.

The ARRC Task Force: Improving the mitigation of impacts of large-scale development projects on apes

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The ARRC (Avoid, Reduce, Restore and Conserve) Task Force is an initiative of the IUCN SSC Primate Specialist Group that was established in 2020 to tackle one of the most significant threats to ape populations which comes from large-scale development projects (e.g., extractive, renewable energy and infrastructure projects). The expansion of the mining sector alone overlaps with and could impact c.35% of African great apes. More specifically in Guinea in West Africa, mining activities could potentially impact c.70% of the Critically Endangered western chimpanzee (*Pan troglodytes verus*) population remaining in this country. Most of the demand in minerals is driven by the Global North's consumption patterns and for its 'green energy' transition. Here I will present how the ARRC Task Force is bridging the gap between primate conservation and sustainable development, and how it is supporting primatologists to engage with the private sector. I will also delve into a case study for Guinea, which highlights the limits for development if we want to apply best practice standards, as well as the need for prior national strategic assessment and planning to reconcile development with primate conservation.

Tracing the evolution and global spread of *Yersinia pestis* using second pandemic European genomes

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The most notable epidemic wave of the second plague pandemic, the Black Death (1346-1352), killed ~30-50% of the European population, and proceeded five centuries of decadenal epidemic waves. Genetic material isolated from the Black Death has revealed *Y. pestis* strains with identical genetic sequences however, as sampling has expanded, so too has our understanding of the bacterium's evolution. To date, there is considerably less information regarding the epidemic waves that occurred immediately after the Black Death, historically referred to as pestis secunda and pestis tertia. Characterizing *Y. pestis* genomes from this time frame remains important as pestis secunda gave rise to the third plague pandemic, and pestis tertia occurred immediately before the attenuation of virulence in second pandemic strains. To explore these questions, samples from Hereford Cathedral and York Barbican, which showed genetic evidence of *Y. pestis* upon sequencing, were enriched for the pathogen. While the precise second pandemic waves to which these samples belong remains uncertain, analyzing these genomes within the broader geographic and temporal history of plague outbreaks may provide insight into the adaptations and spread of Y. pestis after the Black Death.

Exploring the gut ecosystem of wild howler monkeys in pristine versus disturbed habitats using shotgun and 16s sequencing

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The gastrointestinal microbiome is a complex and dynamic ecosystem of microorganisms, including both symbiotic and parasitic species, that plays a critical role in host health, physiological processes, and environmental adaptation. Maintaining homeostasis involves a delicate balance between the host and its microbial inhabitants, as well as among microbial and parasitic taxa themselves. This delicate balance is sensitive to environmental changes, particularly human-driven habitat disturbance, which may disrupt host-microbe-parasite interactions. Despite growing interest, these impacts remain understudied in free-ranging wildlife. In this study, we examined the gut microbiota and parasitic communities of wild mantled howler monkeys (Alouatta palliata) in Costa Rica, comparing individuals from relatively undisturbed forests to those inhabiting two heavily fragmented landscapes. We collected fecal samples from 21 individuals and

performed copromicroscopic analyses to assess parasite prevalence and infection intensity. To characterize bacterial communities, we conducted 16S ribosomal RNA gene sequencing of fecal DNA. Additionally, for 19 individuals, we performed shotgun sequencing to assess broader microbial community composition beyond bacterial taxa. Our results revealed that monkeys in disturbed habitats exhibited reduced bacterial diversity and shifts in bacterial community structure, as detected by 16S sequencing. However, metagenomic profiles did not show the same level of differentiation between habitat types, and revealed different microbial profiles compared to 16S sequencing, highlighting key methodological differences and the need for careful selection of sequencing approaches in microbiome studies. When examining parasite infections, we found a significant association with variation in microbial composition, suggesting possible interactions between parasitic load and microbiome structure. These findings underscore the ecological impact of habitat disturbance and parasite infection on gut microbial communities, with important implications for primate health, disease susceptibility, and conservation strategies in increasingly human-altered environments.

Habitat use, behaviour and diet of the critically endangered *P. coquereli* in a human-modified landscape, northwestern Madagascar

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Anthropogenic disturbance in the form of spatially and temporally unpredictable resource availability and abundance can generate ecological pressures on resident animals. Some primate species can adapt to land-use changes by changing their activity budgets, ranging patterns, and diet. These strategies enable individuals to maximise their energy intake and/or minimise energy expenditure, thereby coping with changes within their habitat. Currently, our knowledge of how Coquerel's sifaka (*Propithecus coquereli*), a critically endangered lemur, responds to anthropogenic habitat disturbance remains poorly understood. In this study we aim to investigate how Coquerel's sifaka (*Propithecus coquereli*) adjust their ranging patterns, behaviour, and diet in a human-modified landscape in northwestern Madagascar. We conducted behavioural day follows on five groups of *P. coquereli*, three occupying anthropogenically disturbed habitats and two occupying undisturbed forest habitats in the Mariarano Forest Complex. Every 20 minutes throughout the day we collected GPS points for range mapping, activity budgets using instantaneous scan sampling and tree species and plant parts when individuals were seen feeding. Home and core ranges were modelled using kernel density estimators, and differences in activity budgets and diets were calculated. Groups in disturbed areas had on average smaller home ranges and core areas compared with undisturbed groups (3.6 ha/1.2 ha and 1.1 ha/0.24ha, respectively).

These groups were found to spend significantly less time feeding, and significantly more time engaging in social, locomotion, and vigilance behaviours. No difference in resting behaviour was observed. Sifakas in disturbed areas exploited fewer plant species than those in undisturbed areas (29 and 46 species, respectively). Diets for disturbed groups consisted of 46% leaves, compared to 67% for undisturbed groups. These results suggest sifakas living in anthropogenic habitats are likely adapting their behaviour and diet in response to environmental pressures. Our research is a key component to understanding how this species persists in human-dominated landscapes.

Theorizing menopause: Simulating the emergence of menopause using the rate of living theory

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Explanations for the origin of human menopause are debated in the evolutionary biology community. Hypotheses and theories surrounding menopause emergence, such as the grandmother hypothesis, which involving grandmothers aiding in caring for their grandchildren rather than birthing and raising their own, have been thoroughly reviewed. The objective of this poster is to supplement existing debates with the Rate of Living theory. This theory involves oxidative damage processes, in which byproducts of aerobic metabolism, particularly free radicals and reactive oxygen species, impair cells, especially sensitive cells such as those comprising ovarian follicles. One consequence from increased lifespan, as observed over evolutionary time in humans, would be diminished late life fecundity. The origin of human menopause was simulated using a computational model, coded in Wolfram language. A variety of demographic parameters for two sample populations (one long-lived with menopause and the other short-lived without) were compared to determine which sample would outcompete the other under a range of conditions. Specifically, the ages at which fertility begins and ends for the menopausal group were manipulated, and age-at-death, age-at-last-reproduction, number of offspring, and proportion of adult life spent non-reproductive were determined for both groups. The menopausal group outcompeted the non-menopausal group in terms of age-at-death and age-at-last reproduction, except when menopause was manipulated to be early in life, as the non-menopausal group is still able to reproduce and pass their genes to their offspring while the menopausal group cannot. These results suggest that a menopausal phenotype evolved in humans from diminished fecundity initiated by increased lifespan. Further manipulation of other variables, such as age at first reproduction may be useful in determining more differences between the groups. Anthropologically, investigating how menopause emergence may have affected other tissues, such as bone structure, may be interesting.

Comparison of activity estimation in two Near Eastern Neolithic sites

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Two Neolithic settlement sites were examined for this study: Ganj Dareh, 10,000 Cal BP in Western Iran, and Bouqras, 7,000 Cal BP in Eastern Syria. The findings at the two sites indicated a transition from a pastoralist to an agricultural subsistence. This transition reflects not only alterations in dietary practices but also changes in the physical exertion and activity patterns experienced by humans. An analysis of musculoskeletal stress markers was performed on particular bones and muscle attachment sites to evaluate various activity patterns. The study aimed to determine if there were discernible differences in robustness between the upper and lower extremities at both sites when exposed to strenuous repetition. The hypothesis proposed that a difference would develop between the extremities; the lower extremities demonstrating greater robusticity due to the repetitive strain associated with goat herding at Ganj Dareh. To test the hypothesis, the Mariotti technique was used. To reduce scoring bias, each collection was assessed three times on different days. Results demonstrate mixed outcomes regarding the differentiation in robustness between the upper and lower extremities, leading to the rejection of the hypothesis. This suggests a potential division of labour among Ganj Dareh, indicating that the individuals studied engaged in activities that predominantly utilized the upper extremities or both. The rejection of the null hypothesis could be due to factors such as sample size, disease, human error, methodological limitations, differences in the entheses examined, or the lack of examination of certain entheses due to the fragmentary nature of the remains.

Assessing the reproducibility and forensic utility of the Wright and Vásquez (2003) method for estimating long bone length from fragmented femora

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In forensic anthropology, stature estimation is an essential component in the process of creating a biological profile from human skeletal remains. Studies have shown that methods with the highest accuracy have been produced using the femur. These studies often require a complete femur to generate the estimation, hindering their real-world application when the femur is fragmentary. Wright and Vásquez (2003) developed a method to estimate femur length from segments of a fragmentary femur, though its systematic reproducibility and utility were not tested. Five segment measurements from 30 femora comprising 18 male, eight female, and four undetermined sexes were collected from the Anthropology Teaching Collection at the University of Windsor. These results were then assessed for measurement reproducibility, if the accuracy of the estimation was

dependant on the use of sex-specific equations, and overall forensic utility. Results showed that all five segments are reproducible with low variation in intra-observer error; sex-specific equations have minimal bearings on the overall results; the method presented in the original paper does not allow for forensic utility.

Mixed methods as a solution to technology fascination bias for unmarked grave prospection

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Anthropologists and archaeologists work at the nexus of natural and social sciences. We appreciate the multidisciplinary complementarity that helps us understand our complex behaviour and its dynamic interaction with the human body and environment. In the often-frustrating investigation of missing persons and prospection for unmarked burials, people often quickly and uncritically turn to technical solutions. In June 2025, at an international event on new technologies and missing persons, there were evangelists of artificial intelligence, machine learning, geophysics, digital modelling, open-source intelligence, and satellite imagery. From among them came a quiet, uncommon voice that softly warned about “technology fascination bias.” In this presentation, I will present cases of the search for missing person burial sites in different countries (e.g., Spain, Colombia, Iraq, the Democratic Republic of Congo), and the interaction between different manners of searching; it will illustrate the tendency of people to favour “scientific”, or technical methods over more conventional sources of information such as witness testimony and archives. The potential negative consequences of this will be addressed, specifically the egregious further harm that can be caused to families and communities of missing persons when we create unrealistic expectations. I will also acknowledge the great promise of evolving technologies to support investigations, emphasizing the importance of discerning experimentation with developing technologies from implementation. I will stress the critical importance of being honest and forthcoming with stakeholders about possibilities and limitations. Ultimately, productive investigations consider multiple methods, typically starting with witness testimony, then testing that with other tools, sometimes in a nested approach that is dependent on the success, failure, or uncertainty of each effort. In different circumstances distinct methods – be they social or technological – will fail us, and the most reasonable approach is a flexible and adaptive one.

Mapping malaria mortality: A spatiotemporal analysis of 19th-Century Ontario

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Malaria was both epidemic and endemic in 19th-century Ontario, yet its historical distribution and determinants remain understudied. This limits our understanding of how socioenvironmental factors shaped disease vulnerability in the past and how such dynamics may inform present-day concerns in light of climate change. This study examines the spatiotemporal distribution of probable 19th-century malaria mortality in relation to environmental modification and anthropogenic activity. The dataset includes n=2,634 probable malaria deaths recorded between 1831-1900, derived from Ontario death certificates and cemetery burial records. Locations of death or burial were georeferenced using historical and modern Ontario geographic data files, and integrated with shapefiles for railways, roadways, and settlements in ArcGIS Pro. Average Nearest Neighbour (ANN) tests for the full dataset and decade-based subsets were statistically significant ($p < 0.001$), indicating strong clustering of malaria mortality. Heat maps generated using Kernal Density Estimation (KDE) revealed decade-specific clusters of malaria mortality, closely aligned with settlement growth and expanding rail infrastructure. Preliminary results point to strong clustering patterns; ongoing analysis will incorporate wetland loss and deforestation to further evaluate ecological drivers of malaria risk. By producing the first spatial analysis of historic malaria in Ontario, this study positions an underrepresented region within broader discussions of paleopathology and historical epidemiology, allowing comparison with better-documented temperate settings in Europe and the United States. These results demonstrate how colonial land use and infrastructure development altered local ecologies in ways that structured malaria risk. More broadly, this study demonstrates the value of integrating archival and spatial approaches to reconstruct past disease ecologies, offering comparative insights for paleopathology and present-day surveillance under climate change.

Searching for the missing with historic human remains detection dogs

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For the past 3 years, the Ottawa Valley Search and Rescue Dog Association has been deploying historic human remains detection dogs (HHRDDs) to archeological projects, in the search for unmarked burials. Most of these searches have been related to Indian Residential Schools. This session will discuss capabilities, strengths and limitations of the HHRDD, as well as recommended protocols for their use. Lessons learned through participation in dozens of anthropological projects will also be discussed.

Good fences make good neighbours: Skeletal differences between Canadians and Americans in FORDISC 3.0

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The FORDISC 3.0 software is used in forensic anthropology for the assessment of sex and population affinity in unknown individuals. The American White reference population in FORDISC 3.0 comprises data from skeletal collections across the US and is considered the most extensively represented group in the software. Despite the absence of Canadian data in FORDISC 3.0, forensic anthropologists in Canada have used the software for teaching and casework under the assumption that Canadians' similar population structure, including a prominent European heritage, is enough to warrant a valid comparison to the American White reference population, and concurrently obtain an accurate result for their assessments. However, this assumption has never been tested on a modern, Canadian reference sample to confirm whether it is scientifically sound. Studies across the world have demonstrated that centuries of gene flow, genetic drift and mutations can all contribute to distinguish populations both genetically and phenotypically. Thus, the hypothesis that Canadians and Americans may differ skeletally after 400 years of population divergence deserves to be explored further. The purpose of this study was therefore to assess the reliability and accuracy of FORDISC 3.0 on a modern, Canadian reference sample. Cranial and postcranial measurements were taken from a sample of 25 modern skeletons of known origins, curated at the Anatomy Laboratory at the Université du Québec à Trois-Rivières, and subsequently entered in FORDISC 3.0 to evaluate the frequency of accurate assessments by the software. Results indicate that 52% of individuals were misclassified using cranial measurements, while postcranial measurements performed better, with only 20% of individuals being misclassified. White males were most frequently misclassified as White females or Hispanics, suggesting Canadian males may be smaller than American White males. Recommendations are therefore offered for the use of FORDISC 3.0 in teaching and casework for the Canadian forensic anthropology community.

Evaluating a tool-use rehabilitation protocol for rescued capuchins (*Sapajus spp.)*

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Capuchin monkeys (*Sapajus spp*.) represent the second most common primate genus in Wildlife Rescue Centers (CETAS) in Brazil; most were victims of animal trafficking. Capuchins are known for their complex foraging skills, such as using stones to crack nuts, a behavior essential for survival in the harsh caatinga, a Brazilian desert-like biome. However, the prevalence of these behaviors declines when animals are in captivity. The objective of this study was to apply, adapt, and evaluate

a rehabilitation protocol for tool use, analyzing the influence of individual factors such as personality, sex, and age on the animals' performance. The study was conducted at CETAS IBAMA in Paraíba, Brazil, with 23 capuchin monkeys (*Sapajus spp.)*. We used a four-week baseline observation period, followed by a manipulative rehabilitation protocol with 12 sessions on alternate days over 5 weeks. The protocol was structured in three phases to facilitate learning. We found a significant increase in feeding time in the final phases, phase 2 (Estimate = 0.37, z = 2.22, p = 0.026) and phase 3 (Estimate = 0.87, z = 5.06, p < 0.001), a decrease in simpler and ineffective behaviors (Estimate = -0.83, z = -3.03, p = 0.002), an increase in the frequency of use of stone-and-anvil tools, which was 40 times higher than at the start of rehabilitation (Estimate = 3.70, z = 3.21, p = 0.001), and an increase in food handling during non-training periods (Estimate = 0.49, z = 1.92, p = 0.056). Overall, our protocol was effective at increasing the frequency of the most complex tool use and the frequency of manual foraging manipulations in general. These are positive outcomes for improving welfare for captive individuals and potentially improving release outcomes for rescued monkeys.

Novel methods and applications for the reconstruction of performance from soft-tissue datasets

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Muscle architecture – defined as the internal organization of fascicles within a single muscle body – has long been used as an anatomical proxy for the reconstruction of behavior, ecology, and performance across myriad taxa. Until the last decade, this work has been conducted solely via a single modality (gross dissection). However, advances in 3D imaging technologies and innovations from biochemistry have given to rise to new methods, including diffusible, iodine-based, contrast-enhanced Computed Tomography (or DiceCT). Here, we share some recent developments in the algorithmic reconstruction of muscle architectural properties from DiceCT data; demonstrating their strong accordance with other, previously established techniques while showcasing some of the novel streams of data these methods permit. Subsequently, we utilize these data to predict performance levels (e.g., maximal contractile forces) from anatomical datasets, which are then compared to in vivo kinetic data collected from living animals under controlled experimental conditions. We demonstrate a tight correlation (r2 values of 0.93 and 0.94, respectively) between anatomically predicted forces from the forelimbs and hindlimbs and their experimental counterparts. However, slopes of 0.68 and 0.79 respectively suggest that anatomical force estimates routinely overpredict contractile force potential. Taken together, this work highlights the potential of recent methodological innovations for more comprehensively exploring and understanding the form-function interface, but also cautions against direct inferences of force magnitudes taken from anatomical data alone.

Insights into the evolution of vision in early primates: petrosal lobule size in *Dryomomys szalayi* (late Paleocene, Wyoming)

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Dryomomys szalayi is a plesiadapiform belonging to the Micromomyidae family which branched off very early from the primate stem. *D. szalayi* is one of the most primitive primates known from cranial remains. The volume of the right petrosal lobule of *D. szalayi* was obtained from high-resolution microCT data. The lobule endocast was compared to a broad range of fossil mammals, including other plesiadapiforms, to study neuroanatomical changes occurring in the primate stem. The petrosal lobules are part of the cerebellum which fills the subarcuate fossa of the cranium. As part of the follicular-parafollicular complex they regulate smooth pursuit eye movement. As such, their size may relate in part to the visual adaptations of a particular taxon. Previous work has shown changes through time in the size of petrosal lobules, with an increase in their relative size through the early Tertiary. Compared to other early Tertiary mammal endocasts, *D. szalayi* and the microsyopid plesiadapiform *Niptomomys cf. doreenae* from the late Paleocene have among the highest petrosal lobule percentages when scaled against body mass (0.0274 % and 0.0326 % respectively), values that are unexpectedly large for their time period. Notably, with respect to plesiadapiforms, *D. szalayi* has a larger petrosal lobule than both *Ignacius graybullianus* (0.0195 %) from the later occurring early Eocene and *Microsyops annectens* (0.002 %) from the middle Eocene. These findings suggest that the expansion of cerebellar petrosal lobules in Euarchontoglires did not follow a single, linear trajectory. The data points to a mosaic pattern of evolution, with different lineages exhibiting variation in lobule size at different times. With respect to *D. szalayi* specifically, these findings may suggest a change in the relative importance of the visual system, such that it was adept at tracking moving items such as prey.

Edge and succession effects on spatial cohesion of endangered blond capuchin monkeys (*Sapajus flavius*) in a fragment of the Atlantic Forest, Brazil

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The Endangered blonde capuchin (*Sapajus flavius*), endemic to Brazil's Atlantic Forest, is highly vulnerable to habitat fragmentation. Our study focuses on a group of ~150 habituated individuals living in a 290-acre forest fragment surrounded by agricultural land, where recent changes in crop type have altered the landscape context. This study investigates how edge effects (environmental

changes at forest boundaries) and forest succession stages (levels of regeneration) affect spatial cohesion (distance between individuals) in this fragmented habitat. Data collection will use scan sampling and GPS via Locus Map 4. We will also use data from phenology characterization (fruit productivity and arthropods), as well as trail camera recordings to draw conclusions based on food availability and predation risk. Using QGIS and Python, we will calculate group extent and individual distances from the centroid. Mixed-effects models will assess the roles of edge, succession, strata, behavior, and age-sex class, including their interactions. We hypothesise that (1) median age-sex group distance to centroid will be affected by succession stages and edge proximity, (2) group spread will be influenced by succession stages and edge proximity and (3) behaviours exhibited will vary across succession stages and proximity to the edge for different age-sex groups. This poster will present the context, methods and preliminary results of this research project, to critically evaluate the usefulness of a variety of field methods, and help fill key gaps in primate research, regenerating forests and support conservation strategies for *S. flavius*, in order to help maintaining population viability in fragmented landscapes.

Revitalizing past bioarchaeological projects: Archival work and historical bioarchaeology as a way to shed new light on identities of people from nineteenth-century North America.

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Bioarchaeology in the twenty-first century is tasked with working within ethical limitations. In the modern world of North American bioarchaeology, it is often the case where human remains sit passively in storage because of research restrictions. A proposed solution to this limitation is archival research on the respective material with the goal of consultation and reburial. The purpose of our project was to determine the best next steps for the collection of settler human remains cared for by Western's Anthropology Department. This is an issue that many institutions are facing, with little precedence or direction on what to do. Much of this material has been previously studied and, in the case of the material chosen for this work, osteobiographies have been completed on each individual. Now, in the age of widely accessible technology, we can undertake archival research in a way not possible at time of excavation. This method is employed as a means of expanding on and adding to the life histories of these individuals. We chose two case studies to highlight this: (1) Peg-Leg Brown; (2) The Stirrup Court Cemetery. Both cases are of nineteenth century non-Indigenous human remains of non-consenting individuals. Through archival research on these individuals and sites, it was possible to determine many aspects of identity that had been previously unknown. Names, age, potential descendants, and various other life stories were found through online ancestry platforms, local archives, and digital archives. We are in the process of determining the appropriate contacts for consultation. While there are limitations to the application of this method, it is an accessible and non-destructive method of research that, when

possible, should be applied. Our proposed next steps are to make the information available to next of kin or to find an appropriate and respectful outcome for the individuals.

Renewed palaeoanthropological research in the Nyabusosi Formation of the Albertine Rift, western Uganda

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The Nyabusosi Research Project (NRP) is renewing palaeoanthropological research in the Nyabusosi Formation in western Uganda, seeking to understand the forces driving human evolution by investigating the diversity of adaptive challenges faced by hominins and their technological responses. Most research about the paleoenvironmental context of early hominin evolution focuses on evidence from the eastern branch of the African Rift, which do not represent the complete range of ecosystems or environmental changes across the continent. We report on new data from NRP research in the Nyabusosi formation, which is situated in the western branch of the rift, adding new context to debates about human evolution and environmental change. We provide preliminary results of paleontological and archaeological surveys in Miocene- to Pleistocene-aged sediments, isotopic analyses, and lithic technology. Our fossil surveys found that the diversity of recovered mammalian fossil remains include bovids, equids, hippopotamids, proboscideans, and suids. Preliminary dental enamel stable isotope data show the presence of closed canopy vegetation in late Miocene mammalian herbivore diets, along with non-forest C3 and C4 biomass that remain abundant in the diets of herbivores into the Pliocene and Pleistocene. Archaeological surveys and test excavations at Pleistocene sites provided preliminary lithic data that confirm patterns found previously in the Nyabusosi formation, contrasting other localities in the eastern rift, with evidence for early (1.5 Ma) prepared core bifacial flake production. We add new lithic data from archaeological localities in the Makondo (2 – 1.8 Ma), Behanga (1.8 - 1.5 Ma), and Kagusa (1.5 Ma) members of the Nyabusosi formation, including the presence of biface technology, and potential new Pliocene archaeological sites. Future archaeological fieldwork and technological analyses, combined with paleoenvironmental and geochronological work, will build a better understanding of changing environments and hominin behavioural adaptations in an understudied region in human origins research.

Addressing the application of evolutionary theory in forensic anthropology: A scoping review

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The purpose of this research was to evaluate if and how evolutionary theory and quantitative genetics inform phenotypic predictions in forensic anthropology by performing a systematic literature review following PRISMA. This was done to understand the extent to which evolutionary theory is integrated into forensic anthropological literature and practice. Forensic anthropologists (FA) conduct the biological profile to assess skeletal age, sex, stature, and population affinity of a deceased individual. Both metric measurements and morphological scores of skeletal traits are used in these assessments. Issues surrounding the theoretical understanding of trait development have been brought forth as a critique of forensic anthropology. Quantitative genetics focuses on understanding the genetic basis of complex traits, many of which are relevant to biological profile assessments. The incorporation of evolutionary theory and quantitative genetics into forensic anthropology has not yet been reviewed. A systematic review using PRISMA, through the Scopus database, was performed using the following inclusion keywords: evolutionary anthropology, evolutionary theory, quantitative genetic(s), heritability, forensic anthropology, biological profile, skeletal morphology, geometric morphometric(s), trait(s), and phenotype. The review included articles from journals published within the last 100 years. Roughly 20% of screened articles included discourse on evolutionary theory in relation to forensic anthropology. No articles were found with quantitative genetics in relation to forensic anthropology. Approximately half of the articles were theory-based, and the remaining contained a methodological approach. Evolutionary theory was most present in articles about sex assessment and dentition. While these findings show evidence of evolutionary theory acting as a foundation for traits as a predictive tool (i.e., sex assessment), further research must be done to support these methods in other aspects of the biological profile. These findings highlight the need for interdisciplinary collaboration in future research between FA, geneticists, and biological anthropologists, among others.

Kinship dynamics and social integration of adult female chimpanzees in Kibale National Park

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Among social primates, an individual's access to related social partners changes over the life course according to demographic and dispersal patterns, with downstream impacts on social behaviour. These processes have significant potential to be influenced by local ecology. Determining how animals' social behaviour responds to demographic patterns will help predict

how primate populations respond to temporal and regional shifts in ecology. We examined 17 years of demographic and behavioural data on N = 16 adult female chimpanzees living in Kibale National Park, Uganda. Though female chimpanzees typically disperse to new groups at maturity, variation in dispersal, reproduction, and mortality shapes females' access to related partners, namely adult offspring, during adulthood. We aimed to a) determine typical patterns of co-residence with adult offspring over the life course and b) apply social network analysis and generalized additive models to assess how co-residence of adult offspring influenced female social integration across the lifespan. Maternal sociality may be strongly shaped by access to adult offspring; alternatively, mothers may flexibly invest in their social networks, regardless of the types of social partners available. Maternal co-residence with adult offspring peaked and plateaued from ages 38-49 and declined thereafter. Mothers rarely co-resided with more than one adult offspring simultaneously. Mothers co-residing with more adult offspring were more socially central in the grooming network over the life course (eigenvector centrality). Though they did not have more grooming partners (network degree), they did have higher rates of grooming interaction (network strength). However, the positive effect on network strength diminished with age: old mothers exhibited low rates of grooming, regardless of co-residence with adult offspring. These results indicate that co-residence with adult offspring impacts the social integration of mothers. Anthropogenic disturbances that affect chimpanzee kinship dynamics will impact community social dynamics, in addition to impacts on health and fitness.

Comparing magnitudes of morphological integration in the catarrhine ankle and knee

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Morphological integration describes the coordinated way that traits change due to shared genetic, developmental, or functional constraints. Quantifying magnitudes of morphological integration can help us understand how skeletal elements have responded to evolutionary pressures over the course of primate evolution. In this preliminary analysis, we quantified magnitudes of morphological integration within the catarrhine knee and ankle joints. Ankle and knee joint shape is variable among catarrhines, primarily due to differences in phylogeny, body size, and locomotor mode. Our goal was to determine whether traits have evolved in humans, apes, and Afro-Eurasian monkeys under similar evolutionary constraints, or whether changes in patterns of integration have contributed to the variation we observe. Our sample comprised the tibia and talus of 40 Colobus spp., 40 Papio spp., 40 Gorilla spp., 40 Pan spp., and 40 modern human individuals. Shape was quantified using 79 3D landmarks and semilandmarks in total. We used Vrel, an eigenvalue-based statistic, to measure magnitudes of integration within the distal part of the knee joint (proximal tibia) and within the ankle joint (distal tibia and proximal talar facets). A Z-score transformed

version of the Vrel statistic was used to compare magnitudes of integration among taxonomic groups. We found no significant differences in the distal tibia or the proximal talus. The Colobus proximal tibia was found to be significantly more integrated than that of Pan (p=0.030) and Homo (p=0.010). We suggest that this reflects the evolution of a stable knee in Colobus to facilitate pronograde movement and powerful leaps. Lower integration in both Pan and Homo could reflect their common ancestry and/or separate evolutionary changes in the knee joint allowing for greater flexibility while climbing in Pan and for the evolution of bipedality in Homo. Further analysis including additional catarrhine taxa will provide more insight into ankle and knee evolution.

Behavioural responses by great apes to anthropogenic landscapes

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The great apes (chimpanzee, orangutan, gorilla, bonobo), the closest extant relatives to humans, have experienced substantial population declines resulting from anthropogenic activities. However, the effects of human activity on great ape behavioural ecology have been minimally considered, and outcomes are infrequently discussed. This review examines the published literature documenting behavioural responses by wild great apes to anthropogenic activity. We aim to synthesize the current understanding of how great apes are responding behaviourally to a rapidly changing environment and discuss the potential outcomes and risks of these responses. Using precise search criteria, we found 63 studies documenting changes in great ape behaviour in response to human activity, and despite their broad geographic distribution, we found common patterns and responses to increasing human influence. Literature documented shifts in existing behaviour (27), the generation of novel behaviours (20) or reported both (15). Twenty-seven studies included direct (16) or indirect (11) assessment of the consequences of these behaviours. One study modelled a widespread loss of existing behaviours. We found that the most frequently documented drivers of behavioural responses to anthropogenic activity are wide-scale land use conversions in ape habitats. In response, apes adopt crop raiding, and alter nesting behaviour, range use, and social strategies. While these responses appear to allow survival in the immediate sense, they may expose individuals to more risks in the long-term. Analysis revealed that under many contexts changing great ape behaviour is putting strain on the human-primate relationship, resulting in injury, harassment, and even the killing of apes. We found examples of once positive relationships between humans and apes shifting towards conflict, potentially worsening the conservation crisis and inviting inquiry into tolerance thresholds among human communities. We emphasize that great ape behavioural responses to human activity must be interpreted through a locally specific lens.

Towards a biocultural synthesis of adolescence

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Adolescence is a sensitive and dynamic period ranging from ages 10-24 and includes a cascade of biological changes and sociocultural transitions to adulthood. However, biocultural approaches to adolescence have been less well developed within existing research compared to children and adults. This is especially surprising given decades of iterative work on the biocultural synthesis in biological anthropology. In this review paper, we present a roadmap to revisit received wisdom about adolescence and to push the biocultural study of adolescence forward in new directions. Drawing on existing anthropological, human biological, and biocultural work, we present three main opportunities to challenge assumptions, embrace adolescent diversity, and innovate biocultural methods in the study of adolescence. We discuss the ways biological anthropologists can reflect upon this synthesis in their future studies with and among adolescent populations in varied social and ecological contexts.

A human rights perspective on collections of purchased human skeletal remains

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A new standard is being set for ethical engagement with human skeletal remains in biological anthropology. In Canada, this has been spearheaded by the Rematriation and Repatriation of Indigenous Ancestors. Still, these are far from the only people held by Canadian institutions, where a re-evaluation of past acquisition practices is in order. Universities in particular hold many sets of human skeletal remains that were purchased from medical supply companies whose practices would not meet present-day ethical standards. However, these human skeletal remains still serve an essential role, providing hands-on osteological training to future biological anthropologists. Human skeletal remains used in teaching and research undergo a physical and metaphysical transformation where commodification and dehumanization can occur in the commercial process, transforming them from human beings into human remains. The use of human rights frameworks is well established in advocating for victims of violence, which biological and forensic anthropologists have helped establish. These universal human rights frameworks have shaped the world we live in, establishing fundamental freedoms for people and obligations to respect them. The application of these human rights principles to human skeletal remains has been less explored in biological anthropology, where individual consent and community engagement have been at the forefront of reform. Many human rights do not apply to the dead, but those that do can help determine our collective responsibility to human skeletal remains, the communities they come

from, and the biological anthropologists who learn from them. These relationships are also highlighted by many descendant communities who advocate for the appropriate treatment of all Ancestors. Acknowledging the human rights of human skeletal remains centers their humanity and universalizes the rights they hold. This can help the development and implementation of clear frameworks and guidelines for organizations and institutions here in Canada and abroad.

Childhood growth and health in early farming communities of Central Zagros, Iran: Preliminary observations

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In bioarchaeology, childhood growth is seen as reflecting the interaction of distinct biological systems that respond differently to environmental stressors. Dental development, largely canalized and minimally influenced by environmental factors, preserves the underlying schedule of growth and is an ideal estimator of age. Conversely, long bone growth is more plastic and embodies the cumulative effects of poor nutrition, disease, and other physiological stressors. By assessing changes in long bone length by dental age, it is possible to identify deficits in growth and also understand how these deficits were distributed within and between communities that differ in environmental stress exposure. This study combines dental age from tooth lengths with femoral diaphyseal lengths converted to Z-scores (using the Denver Growth Study reference) to compare developmental trajectories in two Neolithic and Chalcolithic Central Zagros communities of Iran, Ganj Dareh (GD) and Seh Gabi (SG). The sample includes 26 children (17 from Seh Gabi and 9 from Ganj Dareh). Results reveal considerable variation among Seh Gabi children, ranging from severe growth deficits to measurements exceeding modern standards (mean Z-score = -1.44). In contrast, Ganj Dareh children demonstrated more consistent growth reductions compared to the reference (mean Z-score=-3.69). Statistical comparison using Welch's t-test indicates a non-significant difference between two sites (p=0.11), suggesting a trend toward greater growth deficit at Ganj Dareh that the current sample cannot confirm at conventional significance thresholds. These patterns are consistent with site-level differences in chronic stress exposures (e.g., poor nutrition, disease burden, socio-economic inequality) but must be interpreted cautiously given the sample size. This study will pursue subsequent analyses of long bone appositional growth, which can help clarify how growth in children at these two sites reflected differences in chronic stress exposure of early farming communities.

Human histology in anthropology: A scoping literature review of methods, variables and elements studied

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Histology, the microscopic study of tissue, has been employed in anthropology for years, it has been used in estimating age, assessing taphonomic changes and in origin identification (animal versus human). A systematic scoping literature review, to assess the current state of research and existing literature within histology was conducted following the PRISMA-ScR methodology examining three electronic databases: Web of Science, Scopus and PubMed. Through the scoping review, 264 articles were identified and used to create a summary table of the current state of research including: the aim of the histological analysis (i.e. age estimation, origin identification, ontogenetic changes, etc.); elements examined; variables evaluated; stains used; imaging modalities implemented; and so forth. Research in histology has increased steadily over time, with most articles being published between 2011 and 2020. While the vast majority of articles focused on methods of estimating age-at-death, the second most common theme was assessing anatomical variation, with most articles examining within bone variation (i.e. femoral neck to femoral diaphysis) or in small regions between two bones (i.e. comparing a vertebral body to iliac crest). Across all studies, the femur was the most frequently examined element (n=102), followed by the ilium (n=77), rib (n=50), tibia (n=34), and humerus (n=28). Some studies examined multiple elements in their research, but most examined only one element. This scoping literature review demonstrates that histology is an underrepresented area of research in human osteology with most efforts focused on adult age estimation and animal versus human. One area that has received very little attention is juvenile bone histology. Age estimation, health status, and distinguishing animal from human require distinct methodologies for non-adult humans compared to adults. Scoping reviews are valuable approaches for establishing the state of the art in a discipline and in helping to define new directions for research.

Evidence for health impacts with pastoralism? Preliminary results from dental imaging and histology of fisher-foragers and herders from the Lake Turkana Basin, Kenya

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Globally, transitions from hunting and gathering to agriculture are thought to correlate with declining human health, yet little is known about similar impacts on populations transitioning to mobile pastoralism. This is partly due to a lack of well-documented regional archaeological assemblages with human remains spanning this transition. We present new data from one such scenario around Lake Turkana in northwest Kenya where African Humid Period (AHP) fishing-foraging economies were succeeded by pastoralism without strong evidence for population replacement. We studied teeth (n=21) from 6 foragers and 15 herders following a multi-step methods pathway (see abstract by Sawchuk & Harrington) to non-destructively and destructively investigate surface and internal evidence of enamel hypoplasia and other indicators of growth disruption. We found there is evidence of elevated stress among the early herders, albeit minor. We interpret these results in the context of climate and socioeconomic change during and immediately after the AHP to understand the nature of this local transition to food production. We also report on preservation and diagenesis, preliminary results for crown formation, and initial patterns of growth disruption from surface imaging and histology. These results justify the study of a modestly-sized sample of fragile and fragmentary remains, including their export and destructive testing.

Unraveling debris damage: Comparative analysis with blunt force trauma and thermal damage in forensic anthropological contexts

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This research examined the effects of taphonomic debris on skeletal remains in fire-affected contexts to assess whether such damage can replicate that of blunt force trauma. Thirty pig humeri were utilized as human proxies and allocated into three experimental groups. Each group was exposed to a certain condition including blunt force trauma only (BFT), blunt force trauma followed by thermal alteration (BFT+TA), and thermal debris damage without prior trauma (DD). Analyses focused on fracture types, margin morphology, and thermal alterations. It was found that the group exposed to debris damage presented longitudinal and transverse fracturing similar to the groups inflicted with blunt force trauma, highlighting the potential for equifinality in fracture characteristics. However, fracture margins within the group subject to debris damage were often wider, presenting irregular surfaces indicative of postmortem alteration rather than perimortem trauma. Furthermore, unlike blunt force trauma, debris-induced damage did not exhibit depression, angular, comminuted, or butterfly fracturing. Thermal alteration was found to exacerbate pre-existing blunt force trauma leading to roughened margins but did not mask traumatic patterns. This suggested that certain characteristics correlated with blunt force trauma may be irreplicable in cases involving debris damage. This study demonstrated that while debris damage can show similarities to blunt force trauma, careful assessment allows forensic anthropologists to distinguish between perimortem blunt force trauma and postmortem

taphonomic processes within a fire scene. These findings provide critical insight when examining skeletal trauma in fire scenes, improving medicolegal assessments and assisting in the accurate interpretation of bone alteration in fire-related cases.

Recent advances in Canadian Quaternary palaeoecology inferred through cutting-edge metagenomics from diverse sample types

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Ancient DNA (aDNA) is a burgeoning discipline in Canada, allowing for the recovery of high-resolution and robust palaeoenvironmental data across a wide range of spatial and temporal contexts. This presentation summarizes recent results and ongoing work from the Hakai Institute's ancient DNA program, including research from across Canada and methodological advancements that will help facilitate future work in this country and around the globe. Using a variety of approaches including metabarcoding, targeted bait capture, and shotgun metagenomics, we present aDNA data from paleontological and archaeological sites in British Columbia, Yukon, and beyond. These projects include: 1) a Yukon Middle Pleistocene permafrost record analyzed with targeted bait capture which contains diverse paleoenvironmental information from ground squirrel nests to mammoth mitogenomes; 2) a late Pleistocene marsh on the edge of urban development in BC, where targeted bait capture, shotgun metagenomics, and traditional pollen analyses combine to reconstruct a rich landscape inhabited by megafauna including bison and giant ground sloth; and 3) paleogenomic analysis of faunal remains from caves in coastal BC, which indicate the presence of a cryptic refugium that may have sheltered animals and plants during the Last Glacial Maximum. Together, these data reveal the richness of the Quaternary genomic record in Canada and demonstrate the importance of combining aDNA analyses with conventional palaeoecological approaches to produce vital insights about the past which can teach us about the present and help to plan for the future.

Skeletal dysplasia in an 8th Century CE Avar female: A differential diagnosis

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This poster presents the results of an osteobiography and differential diagnosis for an individual (Ind. 202) from the 8th century A.D. Avar period cemetery of Hirschstetten (Austria). This individual presents with abnormally shortened limbs (particularly forearms). Differential diagnosis included evaluation for metabolic diseases and skeletal dysplasia. The individual was assessed as female, 27-40 years of age at death. Her long bones were shorter than the cemetery average. She expressed severe radial and ulnar shortening and curvature, but only slight shortening in the lower limbs. Some asymmetrical parietal bossing and sagittal suture divergence was also observed, but nothing was noted with the axial skeleton. The fragmentary nature of her remains hindered full long bone metrics, and other assessments. Based on this evidence, this individual likely represents a case of either Madelung Deformity or Acromesomelic Dysplasia (Maroteoux type). Both conditions include symptoms of shortening and curving of forearms, but the former is most likely in that the condition presents bilaterally, does not affect other limbs as significantly, and is not severe enough to impair arm use. Understanding disability in the past gives insight into an individual's life and overall community attitude towards disabled individuals. Ind. 202 did not seem to be physically limited by her limb difference. Modern affected individuals often complain of wrist stiffness, limited wrist mobility, and prominent ulnar protrusion at the distal end, but they retain grip strength and lifting abilities. Despite significant ulnar and radial curvature, well-developed muscle attachments and overall skeletal robustness suggest she still used her arms extensively. In the cemetery, her burial belongings did not differ from others, and she was buried with rings, earrings, and a spindle whorl. This case study contributes to bioarchaeological understandings of disability and presence and prevalence of congenital conditions in the past.

Engaging students in ancient DNA detection

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Ancient DNA is a complex topic that can be challenging for non-experts to engage with in a traditional lecture setting. This talk explores strategies for teaching ancient DNA pathogen screening, emphasizing student curiosity and critical thinking through an active learning approach. Interactive components include hands-on pathogen screening as well as guided analysis and interpretation exercises.

Disentangling archaeological herder diets in southern Africa using palaeoproteomics

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In southern Africa, the adoption of herding did not universally replace foraging but instead created complex mosaics of foragers and food producers, with entangled and shifting lifeways. These diverse and fluid interactions have historically been overlooked due to the binary view of ancient food systems, either forager or food producer. This dichotomy, however, fails to address the nuances of intermittent and/or low intensity herding and how people living in unpredictable environments actually incorporated a wide range of resources into their diet. Understanding these complexities requires deeper evaluations using multiple lines of archaeological and biomolecular evidence. Recently, this approach has been used to illuminate not only which species were being harvested but also to identify specific tissues being processed at sites in the lowlands of Lesotho and in the far northwest of South Africa. Here, by combining faunal analyses with ceramic-bound lipid & protein analyses and zooarchaeology by mass spectrometry (ZooMS), we highlight the dietary diversity of low-intensity herders in southern Africa.

Seeing the unseen: Interconnections between social change and burial practice during the Late Chalcolithic Period at Kenan Tepe, Turkey

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Kenan Tepe, Turkey is a multi-period archaeological site that was occupied during the Ubaid Period (5000-4000 BCE), the Late Chalcolithic Period (3360-3020 BCE) and early Bronze Age (3000 – 2800 BCE) (Parker & Cobb, 2012a). Situated in an overlapping region of the ancient Near East, Kenan Tepe is physically located in southeastern Anatolia, yet also within the cultural boundary of greater Mesopotamia. During each period of occupation residents of Kenan Tepe conducted distinct burial practices. The burials include the remains of individuals ranging from in utero-infants to older aged adults, representing multiple burial types and patterns. The excavated burials provide insights into individual health and social position; and reflect deeply embedding meanings in the burial practice. However, the practice of burial does not exist outside the larger social context. Shifting settlement patterns, socioeconomic systems and ideologies impact the practice of burial. The burials from the Late Chalcolithic Period demonstrate a significant shift in the social dynamics at Kenan Tepe. During the earlier Ubaid Period occupation was contained to the main mound, however during the Late Chalcolithic Period the settlement expanded to include the lower plateau and mound complex. Further, adult burials are now present in the site itself, unlike the previous Ubaid Period, and while the larger settlement indicates a self-sufficient, egalitarian society the burials reflect otherwise. This paper discusses how the analysis of burial practices at Kenan Tepe, Turkey during the Late Chalcolithic Period reveals aspects of life at the site not seen in the

assemblage of the living and how the burials reflect the larger cultural influence from Anatolia and Mesopotamia.

Childhood growth and health in Bronze Age communities of Eastern Iranian plateau, Iran: Preliminary observations

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Linear growth is shaped by the intersection of nutrition, environmental strains, and socially structured access to resources. When access to these resources is uneven or disrupted, growth can be impaired, particularly during early life, when physiological systems are most sensitive to stress. As such, childhood skeletal development offers a powerful lens through which to examine environmental and structural stress in past populations. Dental development, governed by a tightly regulated sequence, provides reliable estimates of chronological age. In contrast, femoral diaphyseal length captures the cumulative effects of nutritional adequacy, disease burden, and biomechanical demands. This study, therefore, reconstructs growth trajectories by pairing dental age estimates with femoral diaphyseal lengths among 26 non-adults from two Bronze Age (Shahr-i Sokhta (n = 21) and Tappeh Hissar (n = 5)) communities in the eastern Iranian Plateau. Femoral measurements from individuals with unfused epiphyses were standardized to age-specific Z-scores using Maresh-adjusted Denver Growth Study references. Individual trajectories were situated relative to the Denver mean, and inter-site differences were evaluated using Welch's unequal variance t-test. Results indicate reduced femoral lengths relative to the expected threshold at both sites, reflected in predominantly negative Z-scores. Shahr-i Sokhta exhibits greater variation, with some individuals approaching or exceeding the reference mean. In contrast, values from Tappeh Hissar are more tightly clustered and consistently low. Between-site differences are not statistically significant (Shahr-i Sokhta mean = –1.22; Hissar = –1.34; t = 0.16; p = 0.88), though the small Hissar sample limits statistical power. Stunted growth is often associated with environmental stressors, potentially including status-linked inequality; however, interpretation should remain cautious due to the modest sample size and the absence of socioeconomic covariates in this analysis. While dietary and household-level data remain inaccessible, this osteo-dental offers a scalable framework for future research on stress and skeletal development in ancient Iranian communities.

Using ground penetrating radar in the search for unmarked graves

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Ground penetrating radar (GPR) has been in the Canadian news a lot in the last few years, especially in the search for unmarked graves at former residential school sites across the country. Finding unmarked graves with GPR is challenging, but these challenges are rarely depicted in or understood by the media. This presentation will focus on the physics, limitations and challenges of GPR when used to search for unmarked graves and provide stakeholders with the reasons why this effort requires highly skilled data interpreters and is liable to take many more years to come.

Animal disability and behavioural compensation: A systematic review

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Illness, injury, and physical impairments affect humans, nonhuman primates, and other nonhuman animals. Although disability is an underrepresented topic in animal behaviour literature, such research provides a unique opportunity to contribute to our understanding of behavioural flexibility, innovation, and resilience. It is commonly assumed that disability has negative, if not lethal, fitness consequences among wild animals and be selected against in populations under natural selection. Despite many isolated examples of individuals surviving with physical impairments, a comprehensive understanding of how disability shapes behaviour, fitness, and ecological interactions remains limited. This review aims to explore how animals respond behaviourally to physical impairment, and the extent to which compensatory behaviours emerge across species. A systematic search of the Web of Science's online database for all relevant, peer-reviewed sources was conducted, identifying 5,227 potentially relevant studies. Screening of all retrieved sources was conducted by two researchers against a set of inclusion criteria. We selected 120 studies, spanning 113 unique species across 4 taxonomic classes and 14 phyla, for analysis. We found compensatory responses reflecting behavioural flexibility in 88% of reports (n=106), innovation in 33% (n=39), and increased social support (including care-related behaviours) in 28% (n=33). Supportive caregiving behaviours were commonly observed (44%, or n=19) among longer-lived, group-living species and cooperative breeders (n=44). Furthermore, individuals capable of integrating multiple behavioural adjustments, such as gait modification, sensory reliance shifts, or innovative foraging techniques, demonstrated an enhanced ability to limit the functional constraints of disability. Our findings show that disability-associated compensatory behaviours are widespread across animal taxa, extending far beyond humans and nonhuman primates. Comparative disability research often identifies physical impairment as a driver of behavioural flexibility and innovation. As such, by reviewing case studies of animal disability across disciplines, we can positively contribute to our understanding of care, cooperation, and flexibility in human evolution.

“When I transitioned into adult care, the team was gone!”: Exploring the gaps in the transition to adult care for people living with rare diseases

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When no one has a name for what you are going through and even your doctor is unsure of your diagnosis, the healthcare system becomes a maze without signs; a journey without a map. For people living with a rare disease (PLWRD), their path to care is not built just through medicine itself, but through the relationships and advocacy used to navigate the unknown. To date, approximately 7000 different rare diseases have been identified. Approximately 80% of these are genetic, and 94% have no available treatments. Moreover, the transition from pediatric to adult care presents challenges, as patients often encounter adult care health professionals unfamiliar with their personal experiences of being diagnosed and treated for rare diseases. This paper draws on qualitative semi-structured interviews with PLWRD and members of their social support networks (including parents, friends, and care supporters) to explore gaps in the transition period and identify common factors underlying both shared and different experiences. This study involved 11 virtual semi-structured interviews with both Canadian PLWRD who have previously experienced support from children’s hospitals, as well as parents of PLWRD. From the interviews, five common themes emerged: The Three Transition Stages, The Support Dynamics, The Challenges, The Supports, and The Power of Advocating. These themes emphasized the importance of rare diseases lived experiences, shared new insights into how to increase awareness, and provided a deeper understanding of the lives of PLWRD as they transition into adult care. This research showcases the voices that often go unheard, and who have first-hand experiences with doctor’s visits, finding the right doctors, the environment of the hospitals, finding and accessing treatments, and encountering healthcare professionals. But, most importantly, these are the individuals who know and have experienced the myriad of feelings, pain, and suffering that come with navigating these systems.

Applying fuzzy inference systems to address uncertainty in skeletal sex estimation

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Uncertainty is a persistent challenge in bioarchaeological analysis, particularly in the estimation of biological sex from fragmentary or ambiguous skeletal remains. This study presents an integrative framework for applying fuzzy inference systems (FIS) to sex estimation, developed as part of a doctoral research project. Building on both theoretical and applied perspectives, the framework

combines fuzzy mathematics with morphological and radiographic data to address the inherent ambiguity of skeletal features.One case study, based on empirical data from 128 Iranian skeletal remains, demonstrates the potential of customized fuzzy rules, with accuracy rising to 84%.The findings highlight two key contributions: (1) fuzzy inference systems offer a robust and interpretable alternative to traditional methods by retaining and analyzing uncertainty rather than eliminating it; and (2) population-specific fuzzy models enhance reliability, with particular relevance for Iranian contexts but broader implications for forensic anthropology and bioarchaeology worldwide. By bridging computational intelligence and anthropological practice, this research demonstrates that fuzzy logic not only aligns with human reasoning under uncertainty but also provides a scalable tool for advancing sex estimation in skeletal studies.

Archaic adaptive introgression in modern human reproductive genes

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Modern humans and archaic hominins, namely Denisovans and Neanderthals, have a long history of admixture. Some of these admixture events have allowed modern humans to adapt to new environments outside of Africa. Little research has been done on the impact of archaic introgression on genes associated with reproduction. In this study we report evidence of adaptive introgression of 118 genes within modern humans that have been previously associated with reproduction in mice or modern humans. We identified 11 archaic core haplotypes, three that have been positively selected, with 327 archaic alleles being genome-wide significant for a variety of traits. Over 300 of these variants were discovered to be eQTLs regulating 176 genes with 81% of the archaic eQTLs overlapping a core haplotype region regulating genes expressed in reproductive tissues. Several of the adaptively introgressed genes in our results are enriched in developmental and cancer pathways, while some have been associated with embryo development and reproductive-inhibiting phenotypes like endometriosis and preeclampsia. Lastly, we find that archaic alleles overlapping an introgressed segment on chromosome 2 are protective against prostate cancer. Our results highlight that archaic alleles show connections with important developmental pathways throughout the lifespan and may help regulate these critical processes.

Use of pulp/tooth ratio as an age estimation method in older adults

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Older adults are underrepresented in archaeological samples due to lack of precision in current standards of age estimation techniques for this demographic. Tooth/pulp ratio provides a more accurate age estimation method for older adults than current standards which rely on subjective assessments and are often done visually. In addition, more options are available by using tooth/pulp ratio as an age estimation method as it can be used as a destructive method in the form of histological samples, as well as a non-destructive method in the form of radiographs. This research tested the reliability and applicability of this method on different source materials. The sample consists of teeth sections and both bite-wing and panoramic radiographs, from modern and skeletal collections, all with known ages. In this blind study, exclusively single-rooted teeth were examined, utilizing ImageJ for measurements of all tooth and pulp areas, the values of which were imputed into previously developed equations to calculate age. Using pulp/tooth ratio provided results within 5 years of accuracy, with a mean absolute error for all samples used of 2.6 years. The results aligned with those from other studies using this age estimation method in terms of accuracy of age determined but differed in respect to the reliability of the method based on source material, possibly caused by intraobserver error.

Archaeogenetic insight into the origin of syphilis and other treponemal diseases

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Human treponematoses—including yaws, bejel, pinta, and syphilis—are caused by closely related subspecies of Treponema pallidum. The origin of these pathogens, particularly syphilis, has been contested for centuries, with the Columbian hypothesis attributing its emergence to the Americas and subsequent transmission to Europe, and the pre-Columbian hypothesis proposing its presence in Afroeurasia prior to the epidemic. While the recovery of ancient treponemal DNA initially posed significant challenges that discouraged early archaeogenetic research, recent developments in high-throughput sequencing and methodological innovation have created new opportunities to investigate the evolutionary origins of treponemal pathogens. In this study, we analyze five pre- and peri-contact treponemal genomes from the Americas. These ancient genomes represent sister lineages to T. pallidum subsp. pallidum (syphilis), as well as its close pathogenic relatives T. pallidum subsp. pertenue (yaws) and T. pallidum subsp. endemicum (bejel). Our results suggest unrecognized genomic diversity within the treponemal complex and diversification of T. pallidum lineages after the initial human settlement of the Americas and before trans-Atlantic travel.

Together, these findings provide strong evidence for an American origin of all genomically characterized T. pallidum lineages. This work offers novel insights into the evolutionary history of treponemal pathogens and provides critical genetic evidence that directly informs the longstanding debate on the origins of syphilis.

Evaluating the reproducibility and utility of a stature estimation method using fragmented humeri

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Stature estimation is a critical component of forensic identification, particularly when only fragmentary human remains are recovered from contexts such as dismemberment cases, mass disasters, or advanced decomposition. In such scenarios, accurate estimations of stature can contribute to establishing a biological profile, and help narrow down potential matches in missing persons cases. While the femur is often preferred for the estimation, alternative methods using other long bones, such as the humerus, are necessary when the femur cannot be assessed. This study evaluates the applicability and reproducibility of regression equations developed by Wright and Vásquez (2003), which estimates the maximum humerus length from its fragmentary segments. From a total of 27 humeri comprising 18 males, eight females, and one of unknown sex from the University of Windsor's Anthropology Teaching Collection, 11 different segments were measured using sliding calipers and an osteometric board. Measurements were repeated to assess intra-observer error. The results showed that while some segments produced consistent and low-error estimates, others (particularly those involving the lesser tubercle) exhibited high mean difference and mean absolute deviation values, indicating poor reproducibility. While the Wright and Vásquez method provides a foundational approach, it is not well-suited for application in forensic contexts without significant modification. Future research should aim to develop forward-based regression equations using diverse samples, and improve observer training and landmark standardization. These steps are essential for creating more accurate, inclusive, and practical tools for estimating stature from fragmentary remains.

Activity budget of *Alouatta palliata* and its associated tail and positional posture

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Tail usage is a critical component of locomotion within platyrrhines. Of the atelidae species, tail prehension is not just an accident for howler monkeys (*Alouatta*). The mantled howler monkeys (*Alouatta palliata*) of La Suerte Biological Field Station depend on their prehensile tails to support

their energy minimizing lifestyle powered by a folivorous diet. Alouatta palliata exploits the large canopy of a fragmented tropical rainforest through exhibiting several different tail and postural positions to shape their activity budget. I investigated which prehensile tail postures are associated with which activities of 53 mantled howler monkeys (*Alouatta palliata*). Subjects were categorized by sex and age class as adult female, adult male, adult of unknown sex and juvenile. A total of 1475 data points was collected using 30-minute point samples with 1-minute intervals following three ethograms; tail posture (tail free, trail-limb suspension, tail social interaction, tail suspension, tail touching, tail wrap), activity (feeding, resting, social behaviour, travelling) and postural position (climb, tripod, laying, quadrupedal position, sitting). I found that all activities, feeding, resting, travelling and social behaviour are most associated with tail-wrapping. The activity budget of mantled howler monkeys (*A. palliata*) is dedicated the most to rest. These results are consistent with previous data which identified the importance of tail attachment for support during not only rest and feed activities, but travel of specifically mantled howler monkeys (*A. palliata*).

Using geometric morphometrics to explore neutral genetic and climate-based models of lower limb variation among Holocene foragers

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The human skeleton is affected by numerous factors that influence bone throughout the lifespan - these include factors such as climate, migration history, activity, and growth and development. In this poster presentation, I explore 3D morphometric variation in the lower limb bones of 5 groups of Holocene foragers relative to paleoclimatic variation, neutral genetic distances, and inferred patterns of activity. This project will determine if morphological variation in the lower limbs reflects neutral processes, or local environmental/climatic conditions. Climate is often assumed to drive natural selection in skeletal morphology. Physiological plasticity within the lifespan explains some variation in linear growth and robusticity, but it is seldom regarded as a major cause of general morphometric variation. To understand shape variation in the human tibia, we devised a novel set of geometric morphometric (GMM) landmarks that aim to capture size and shape variation of the diaphysis, as well as the proximal and distal epiphyses of the bone. These data are integrated with previously collected femoral GMM data to investigate variation throughout the lower limb. We use the R package PastClim to generate spatiotemporally explicit environmental variables for each group, and isolation by distance models to estimate genetic distances. Analyses are done on each region of the lower limb in relation to climate and genetic distance, to determine whether climate-related variation is expressed uniformly throughout the distal limb or is stronger in specific regions that show more rapid growth. The results of this project will advance our understanding of the underlying mechanisms of skeletal adaptability.

Fecal proteomics in field/wild primate studies: A test of three extractions methods

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Fecal proteomics offers an integrated view of biological markers by detecting hundreds of proteins derived from host, dietary, microbial, and pathogenic sources. Because its application to primates is still recent, several methodological questions remain. Can long-term stored, desiccated fecal samples be reliably analyzed using fecal proteomics? Which protein extraction protocols yield the most informative results? Indeed, variations in extraction methods can influence the quantity of protein recovered and the types of proteins represented (e.g. host- versus microbe-derived proteins). To answer these questions, we extracted proteins from four desiccated fecal samples collected in 2013-2014 from wild chimpanzees (Pan troglodytes schweinfurthii) at Ngogo, Uganda using three different extraction protocols: a protocol designed to maximize total protein yield (M); a host protein-focused protocol with fractionation (F); and a host protein-focused protocol that replaces fractionation with precipitation (P). This yielded a total of 16 extractions, which we analyzed using data-dependent acquisition and compared against the reviewed sequences of the UniProt Pan troglodytes reference proteome in FragPipe. We successfully extracted and characterized structural, metabolic, and immune-related proteins from the four samples. The number of proteins identified varied across the extraction protocols. Although not significant, there was a trend for protocol M to identify more proteins per sample than P (Kruskal-Wallis: $\chi^2 = 5.35$, df = 2, p = 0.069; Dunn's test with Bonferroni correction: p = 0.072), but not more than F (p = 1.000). The protocol M also identified the highest number of unique proteins. Functional enrichment analyses revealed overlapping functional categories across methods, but also method-specific differences, with protocol M enriched for mitochondrial pathways and protocol F enriched for glycolytic and regulatory processes. Fecal proteomics holds potential to reveal dynamic interactions between host physiology, microbial communities, and environmental factors. It is therefore a valuable tool for studying primate biology and resilience.

Growing pains: Social roles, fracture prevalence, and fracture risk in adolescence

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Adolescence is increasingly being recognized as a significant and distinct life stage in biological anthropology, with researchers highlighting the unique role adolescents play in shaping their communities. In bioarchaeology, studies examining the transition to adult social roles through fracture analysis contribute to better understanding social age and patterns of morbidity and

mortality in the past. However, understanding fracture prevalence during adolescence requires a biocultural approach that considers the influence of growth and development on fracture risk, as clinical research suggests a transient period of decreased bone strength during the adolescent growth spurt. Using a case study examining fracture prevalence in young people from the Netherlands (1650-1850 CE), this presentation discusses the influence of rapid growth and sexual maturation on fracture risk. Fifty-five individuals (1–19 years) from four collections from the Netherlands (Arnhem [1650–1829 CE] n=26; Eindhoven [1650–1850 CE] n=11; Alkmaar [1716–1830 CE] n=12; and Zwolle [1675–1828 CE] n=6) were analyzed macroscopically and with micro-computed tomography (micro-CT) to investigate fractures related to social activities. Results demonstrate a rise in fracture prevalence during adolescence and were interpreted as resulting from strenuous labor, supporting historical accounts of widespread wage labor in urban environments. Contributing to this, micro-CT reconstructions revealed less bone than expected in several adolescent individuals. Of those assessed, 7/14 individuals with identified fractures fall within the age range associated with peak height velocity and increased skeletal fragility. An increase in skeletal fragility has significant implications for bioarchaeological and paleopathological research as fractures may occur in the absence of or following minimal trauma. Current findings highlight the importance of considering biological age in the investigation of the prevalence and pattern of fractures in the past, although additional research on bone quantity and quality in individuals undergoing growth and development is required.

Embodied biopolitics and morality in the St. Lawrence County Poorhouse

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This poster presents a mixed-method analysis of 19th- and 20th-century admission records from the St. Lawrence County Poorhouse, a social welfare institution in rural upstate New York. Drawing on over 2,500 admissions between 1870 and 1920, this research examines how institutional record keeping reflected and reinforced moral judgements about poverty, illness, and dependency. The analysis focused on details recorded at admission including age, sex, social race, nationality, and marital status, as well as social judgements regarding individuals' social habits, cause(s) of dependence, ascribed ability to labour, and probable destiny. The personal observations recorded by staff about the residents were also examined. . Clear demographic trends emerged such as women being more often admitted between ages 18-30 while men were typically over 30. Assessments of "Capability of Labour" were generally low, especially so for men (17.2% vs 28.8%). Guided by Foucauldian biopolitics, qualitative coding shows categories like "intemperate", "immoral", and "dependent" functioned as tools of institutional logic. Men were more often listed as intemperate (38.7% vs 11.2%), while women were disproportionately judged in moral terms,

reflecting stricter expectations of respectability. Assignments of “Probable Destiny” also reinforced this logic with women slightly more often given “favourable” outcomes (43.2% vs 35.1%). Case studies of four individuals’ admission records illustrate these broader patterns including institutionalization for believed sexual immorality, the institutional interplay of prison and medical systems with the poorhouse, the idea of hereditary hopelessness. This work demonstrates the value of integrating quantitative summaries with qualitative narratives to reconstruct the lived experiences of institutionalization, using the St. Lawrence County Poorhouse as a microcosm for larger social forces.

Dental sex estimation equations and their applicability to adolescent/pre-pubescent archaeological skeletal remains (from the Cis-Baikal region).

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This presentation investigates the use of odontometrics for estimating the sex of prehistoric individuals when traditional methods are unusable. The estimation of sex in human skeletal remains is a key component of biological anthropology; however, it can be difficult to estimate in pre-pubescent individuals or poorly preserved remains. In these cases, researchers have turned to teeth to study sexual dimorphism and estimate sex in past populations. Six dental measurements were collected from an archaeological population (n=81 individuals) of known molecular sex to create a series of equations using discriminant function analysis (DFA). Twelve equations were created, seven of which produced correct classification rates greater than 80%, and two produced rates greater than 90%. As few as four dental measurement across four teeth were used to provide high rates of sex estimation. When tested against a ‘known’ sex sub-sample, 24/26 individuals were correctly classified, including 11 pre-pubescent individuals. The results of this study have shown that sex estimation from the permanent dentition in this ancient hunter-gatherer population is viable, and allowed for the creation of region-specific equations that are inexpensive, easily performed, and highly accurate. These equations can also be applied to pre-pubescent individuals for whom osteological sex estimation methods do not work but in whom some permanent teeth have erupted. The paucity of deciduous teeth from this population means that similar equations cannot yet be created for the deciduous dentition, meaning it is not yet viable for individuals under eight years old. Compared to osteological methods, this dental sexing method works well for individuals aged ~8–18yrs, allowing us to untangle a portion of the “messy middle” of adolescence.

Exploring parameters and limitations: Soil spectroscopy in burial contexts

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Locating unmarked graves while working with Indigenous communities requires sensitivity, as the goal is to preserve the sanctity of these sites by avoiding the negative impact and disturbance of a full excavation. As the search for unmarked graves continues, new technologies are continuously being developed for minimally invasive evaluations of the presence of human remains. However, new technologies need to establish best practices through rigorous scientific testing. Currently, the new soil spectroscopy and penetrometer technology, the Subterra Grey (S4), is being tested within controlled lab and field settings to evaluate its effectiveness in locating potential unmarked graves. Soil spectroscopy can detect adipose decomposition, specifically fatty acid salts, by measuring light waves in the infrared range (1550 – 1950 nm). Penetrometry detects soil compaction by measuring the force needed to penetrate the soil, providing insight into whether a burial was dug. Combined, penetrometry and spectroscopy can detect evidence of human decomposition and disturbed soil, but research has only been conducted into the logistics of the S4, leaving the parameters and limitations unexplored. In May 2025, data and soil samples were collected from the Research on Experimental and Social Thanatology (REST[ES]) at the Université du Québec à Trois-Rivières, with Talisha Chaput and in collaboration with Élisabeth Cuerrier-Richer. So far, it is known that environmental factors, burial time frame, the presence of similar chemical compounds, and characteristics of the deceased can affect the accuracy of the S4. Due to these known factors, parameters and limitations will be measured within the lab, using said samples, by examining the concentration of fatty acid salts with the impact of the following variables: the age of an individual, time of burial, grave environment, grave depth, presence of adipocere and presence of additional chemicals. Without this research, the S4's accuracy remains unclear, limiting clear answers for communities.

Variability in early Inuit dog diets: Insights from stable carbon- and nitrogen-isotope analysis

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This study investigates dietary variation in Early Inuit (ca. 1200 AD–European contact; also referred to as Thule Inuit/pre-contact Inuit) dogs through stable isotope analysis of remains from three coastal archaeological sites in the Northwest Territories. The first two sites, Nelson River and Tiktalik, represent some of the earliest Early Inuit occupations east of Alaska and provide insights into subsistence practices during their rapid migration across the Canadian Arctic to Greenland. This was a period characterized by the central role of bowhead whales in diet and social relations. The third site, Kuukpak, located in the Mackenzie River Delta, reflects a later, more established phase characterized by regionally specific subsistence practices, particularly beluga whale harvesting. Because Inuit dogs were provisioned directly by their caregivers, their dietary signatures broadly reflect Early Inuit subsistence practices and local resource availability. Through stable

carbon- ($\delta^{13}C$) and nitrogen- ($\delta^{15}N$) isotope analysis, this research identifies the relative contributions of marine and terrestrial foods to overall diet. Analysis of bone and incremental dentine collagen further enables comparisons of long-term and seasonal dietary signals, illustrating variability in dog diets within and among sites. These findings contribute to our understanding of regional differences in resource use, and broader patterns of subsistence in Early Inuit communities.

Is maternal agency associated with maternal and child health outcomes in rural Nicaragua?

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The purpose of our study is to determine whether there is a relationship between maternal agency and maternal and child health outcomes. A mother has agency when she is free to do and achieve what she deems necessary in pursuit of her goals. Maternal agency is often broken down into several domains. Accordingly, in this study, we've divided them into the domains of household decision-making autonomy, mobility freedom, financial autonomy, and health decision-making autonomy. Consistent with most of the literature on the topic, we hypothesized that increased maternal agency would be associated with improved physical health among children and physical and mental health among mothers. This hypothesis was evaluated among a sample of 164 maternal-child dyads in rural Nicaragua. Physical health was measured via allostatic load, a measure of the cumulative stress an individual has experienced throughout their life. Maternal mental health was measured via the Self-Reporting Questionnaire 20. Data were evaluated using bivariate analyses initially and subsequently via multiple regression models. While we did find in the bivariate analysis, a significant negative relationship between maternal mobility freedom and child allostatic load, overall, our analyses lead us to reject our active hypothesis; that is, in most cases, maternal agency was not associated with child or maternal health outcomes. We are not sure why our findings are inconsistent with previous studies on the topic, but we speculate that this may be explained, in part, by the culture of Marianismo in which the study participants are immersed.

Quantifying intraspecific variation in muscle architecture across the primate forelimb

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Forelimb morphology is highly variable among primates, reflecting the diverse array of locomotor and manipulatory behaviors used across the Order. While the adaptive form-function relationship

of the primate forearm has been extensively studied, the vast majority of work to date has focused on comparisons of muscle properties (e.g., muscle mass, force potential [PCSA], and excursion potential [fascicle length]) interspecifically between disparate taxa. To understand and contextualize reported interspecific trends, however, it is necessary to first understand the magnitude of variation that characterizes the same variables intraspecifically within taxa. Without this knowledge, it is impossible to infer the true significance of reported interspecific trends. In this study, we analyze intraspecific variation in muscle architectural properties across 13 representative taxa, spanning the full phylogenetic breadth and body size range of the Order. We demonstrate that the forearm muscle architecture morphospace of catarrhines is distinct to that of strepsirrhines and platyrrhines - which overlap significantly. Additionally, arboreal taxa are largely differentiated from their terrestrial counterparts by exhibiting larger digital muscles and smaller wrist muscles – potentially reflecting a need for arboreal taxa to generate more powerful manual grasping forces. Among all lineages, callitrichids consistently exhibit the greatest architectural variability. By comparison, apes have modest intraspecific architectural variation, despite their high dexterity and complex manual usage repertoires. Collectively, these data demonstrate not only demonstrate relatively high levels of intraspecific architectural variation, but highlight that this variation is not equally distributed across taxa: rather, some primate species exhibit higher levels of baseline variation than others, a consideration that should be applied to future interpretations of interspecific analyses.

Dairy consumption and despair: Age and sex differentials of a persistent fever in the Maltese islands

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Undulant fever, also known as brucellosis in humans, is a bacterial infection that most likely originated in Egypt in 1600 B.C. Undulant fever is thought to be debilitating but rarely fatal and is most often contracted from consuming unpasteurized dairy products. In 1887, the bacterial agent was discovered in the former British colony of Malta, where the disease was of great concern because it was infecting British troops stationed on the island. Today, B. melitensis is one of the most common zoonotic diseases worldwide, continuing to remain in Egypt, re-emerging in the Middle East and continues to make an appearance elsewhere, including central Asia and the U.S.A. Few studies have examined the historical impact of morbidity and mortality with respect to age and sex. We deconstruct the undulant fever experience using the 1910-1945 case study of the islands of Malta and Gozo. Findings indicate that the case fatality rate of undulant fever in Malta may have been higher than previously thought, at approximately 5% (higher than the 1918 influenza pandemic), but was less than 1% in Gozo. Using rare nominative data on cases of undulant fever in Gozo, it appears that adults (not children nor infants) were more likely to develop the disease.

Notably, those in their reproductive prime experienced the highest rates of infection in Gozo, which was presumably reflective of that in Malta. The group most at risk of the disease was males (n = 961), with the most cases (69.4%) occurring between the ages of 20 and 24 years. In cases of infection in females (n = 684), 71.2% of cases occurred in women aged 15 to 49 years. This study also explores the cultural reasons why infants and children were less likely to consume dairy products and consequentially become infected with the disease.

Multi-year patterns of crop foraging in Himalayan langurs in anthropogenic landscapes: Spatial clustering, shrinking home ranges, and researchers as scapegoats

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Primates in anthropogenic landscapes frequently forage on crops which causes conflict with local people. Our study leverages multi-year observation of crop foraging events (CFE) by a group of Himalayan langurs (*Semnopithecus schistaceus*) in Garhwal Himalayas, India (3 months (Aug.-Oct.) in 2021, 16 months in 2023-2024). Our long observation period established that CFE are temporally clustered between August and October (2021: *n*=58; 2023: *n*=62; 2024: *n*=48), coinciding with maturation of millets and were sporadic outside these months (*n,* cumulative = 8). Over the three-year period, we found spatial heterogeneity in CFE. These were concentrated in the Northwest part of the home range but the mean center of CFE shifted 160 m South-Southwest (193.18 degrees from the North) between 2021 and 2024. Standard Deviation Ellipses showed that the CFE area shrunk in spatial distribution over time, probably owing to a shrinking of the overall home range. However, CFE increased in density per hectare in most agricultural areas, where the density of points per hectare was highest in 2023. In all cases in 2023/24, it was difficult to ascertain the end time of CFE because the research team faced increasing retaliation and aggression from the local community and had to decrease their visibility near agricultural fields. Our study highlights: 1) the importance of establishing clear definitions and a systematic framework to record CFE to enable comparisons; 2) the spatial clumping of CFE and resulting crop destruction that unevenly impacts farmer livelihoods; and 3) that the local's perception that researchers are responsible for their study animals' behaviour can drive conflict with local communities and block research access. As the home range of these langurs faces more construction and further fragmentation, the clustering of CFE needs to be immediately addressed for a peaceful coexistence between the human and more-than-human life.

Colonized cradles: The Infant Welfare Movement across British colonies in the 20th century

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The turn of the 20th century was marked by focus on the European colonies to improve the health outcomes of mothers and infants. Throughout the British Empire, as in other European colonies, colonial officials set into motion the "Infant Welfare Movement" aimed at reducing high maternal and infant morbidity and mortality rates. The movement included initiatives such as 'baby-weighing' clinics, midwife training and registration, antenatal services, milk depots, maternity homes, and lying-in hospitals. Yet, the motivations behind these interventions in the colonies, along with the quality of care delivered, varied across regions. The goal of this study was to examine welfare initiatives implemented across the British colonies by geographic region from the late 19th to early 20th centuries. The geographic regions explored in this study are the British colonized Mediterranean, sub-Saharan Africa, West Indies, Asia, Middle East, and Pacific territories. The objective is achieved by: 1. Exploring the political, economic, and social motives for each region and how these factors shaped program designs, 2. Assessing the quality of care delivered for each region and the uptake of services by creating a comprehensive record of health outcomes. We conducted a mixed-methods systematic review of the literature that details the infant-welfare initiatives. Rationales behind the movement included the need to increase fertility and mitigate disease in labour forces. Evidence suggests improved infant mortality rates in the Mediterranean, Asian, and sub-Saharan African colonies. A case study of the preliminary assessment of the infant welfare initiatives in the military and civilian populations in early 20th century Gibraltar is showcased. Concern for the deteriorating health of the population during the First World War appears to be one of the motivators for infant-welfare centres in Gibraltar. Access to the service may have been limited to those primarily of British ancestry or those of the upper classes.

Hunter-gatherers: The original Ostromian society?

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The economist Elinor Ostrom famously elaborated core design principles - such as collective-choice agreements, monitoring and sanctions, and conflict-resolution mechanisms - for managing common-pool resources such as irrigation systems, fisheries, and forests. Recent research has situated these Ostromian principles in the context of evolutionary theory and human biocultural evolution, showing how core design principles can improve group efficacy across a wide range of societies. Here we attempt to test these ideas against the ethnographic record. We ask: Do hunter-gatherers exhibit Ostrom's core design principles? We coded paragraphs (n=1051) from the Human Relations Area Files against variables (n=33) that related to collective decision-making and group

function. We found that most design principles found widespread support in hunter-gatherer societies. Functional diversity was high, featuring the inclusion of elder opinion (95.83%) and female presence (75%). Collective-choice agreements were strong, characterized by extensive dialogue (96.15%), consensus (66.07%), and the consideration of minority opinions (71.43%). Monitoring was conducted by the upholding of deliberation norms such as turn-taking (80%), changing minds with evidence (100%), and decision-making with the spirit of utilitarian motivation (83.33%). Additionally, graduated sanctions included the punishment of bad-faith actors (75%) and changing status based on argumentation (83.33%). Finally, while conflict resolution mechanisms were conducted using formal rules (80.85%) and formal councils (69.57%), the use of judicial systems was opposed (33.33%). Overall, collective decision-making was commonplace in hunter-gatherer societies, organized around, specifically, Ostrom's core design principles three, four, five, and six. These results support the idea that Ostromian dynamics characterized human societies long before large-scale common-pool resource management.

Feeding futures: A biocultural perspective on school food equity and Canada's National School Food Program

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National School Food Programs (NSFPs) are an applied policy approach to improving children's nutritional status, social and health equity, and increasing food literacy. In this study I investigate Canada's emerging NSFP using a biocultural framework as an example of human evolutionary food sharing, where cultural practices, social structures and biology interact to affect potentially children's nutritional outcomes. In 2024 the federal government announced the creation of a National School Food Program and Policy (NSFPP) committing $ 1 billion over five years; as of 2025 all provinces, territories and some Indigenous communities have signed on. In 2024 we did an online survey of parents of elementary school children along with focus groups with parents and interviews with teachers to understand how they envision the possibility of developing a culturally inclusive and equitable food program. We found that participants were generally committed to principles of equity, diversity, and inclusion in an NSFP with key elements including halal food options, culturally diverse and Indigenous foods, and a desire for communal eating that reflects older models of food sharing and social cohesion. Some points of contention were how to incorporate diverse food offerings and student dietary needs (e.g. religious and health requirements) into an NSFP. As the NSFP rolls out across the country, we hope to evaluate children's nutritional, educational, developmental and mental health outcomes.

Climate change and habitat fragmentation: Projected distributions of black-horned capuchin (*Sapajus nigritus*) in Brazil

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As anthropogenic pressures continue to drive climate change, the fragmented Atlantic Forest - the only habitat and endemic range of the black-horned capuchin (*Sapajus nigritus*) - is becoming increasingly unsuitable. To assess the species' potential future distribution, current bioclimatic variable data and species occurrence records were used to develop a Maximum Entropy (MaxEnt), creating a presence probability raster for Brazil. This raster was then used to project the species' distribution under a moderate (SSP 126) and an extreme (SSP 585) future climate scenario. The resulting maps illustrate the predicted probability of the occurrence of the black horned capuchin across Brazil under each scenario. Additionally, maps were also produced to demonstrate the probability that the species will continue to occupy the same locations which were observed from the species occurrence records. By using road data to proxy measure forest fragments, we were then able to analyze which fragments were facing the largest changes in predicted probability of capuchin presence. Maps were then produced so that fragments could be visualized and regions with the largest changes could be prioritized for conservation. These projections indicate that under both moderate and extreme climate scenarios, habitat suitability within Atlantic Forest Fragments is expected to decline for the black-horned capuchin.

Collagen clues: Dietary differences between Maya and Aztec populations revealed through stable isotopic analysis

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Cross-cultural bioarcheological studies in Mesoamerica are largely underutilized, and civilizations like the Maya and Aztecs have very little information available to be studied, which does not help this problem. Food is one pathway for studying these populations as it is a large part of how people connect and share culture. People acquire, grow and maintain agriculture and farming practices throughout their lives. The diets and subsistence patterns of the Maya and Aztec peoples offer a wealth of information regarding a population's local environment, social structures, agricultural practices and even trade. Stable isotope analysis is one of the most informative techniques to reconstruct diet and health of past populations. This study examined the dietary differences between Aztec and Maya populations through the comparison of diet composition identified as animal protein versus plant-based diets. In this study, four previously published studies were reviewed, and the raw stable isotopic data was extracted and compiled. A total of 133 adults from Maya and Aztec populations were examined. A scatterplot was made to visually map differences in δ13C and δ15N. Two Mann-Whitney-U tests were performed to compare separated Maya and Aztec data. There was a statistically significant difference in δ13C, meaning a difference in plant

consumption. The δ13C mean for the Maya population (-10.74) was higher than the Aztec population (-8.05) corresponding to a p-value of 0.0008585. No statistically significant difference in δ15N was found, meaning no statistical difference in protein type. δ15N means for the Maya and Aztec population are 9.69 and 9.71 respectively, corresponding to a p-value of 0.404. This poster will explore possible reasons for these results from a cultural ecology perspective; through things such as differences in terrain, cultural practices, agricultural techniques, and study limitations

Dietary changes through isotope analysis ($\delta^{13}C$ and $\delta^{15}N$): The case of the Saint-Just de Valcabrère Necropolis, France (4th to 11th Centuries AD)

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The necropolis of Saint-Just de Valcabrère, located in southern France at the base of the Pyrenees, dates back to the 4th century AD and is associated with the ancient city of Lugdunum Convenarum. From that time onwards, funerary buildings and tombs were continuously continued to be placed on the same site diachronically until the construction of the present basilica of Saint-Just de Valcabrère in the 11th century, when funerary traditions underwent significant changes. Since 2016, over 250 late Roman and Medieval burials have been excavated. This study presents collagen carbon and nitrogen isotopic results (n=102) from 82 individuals to explore shifting dietary patterns between the Roman and Medieval periods. In addition, 20 faunal samples were analyzed to provide a preliminary framework for understanding dietary habits at the site. This first isotopic study of the region, spanning both the Roman and Medieval periods, highlights dietary changes potentially linked to shifts in social structure, political organization, environmental conditions, or a combination of these factors. Over time, adult consumption of animal and plant proteins varied: Roman $\delta^{13}C$ and $\delta^{15}N$ values averaged −19.4‰ and 10.6‰; Early Medieval −19.2‰ and 10.0‰; High Medieval −18.2‰ and 9.3‰. No significant differences in $\delta^{13}C$ and $\delta^{15}N$ values were observed based on the biological characterization of adult individuals, although the data suggest that differences were more strongly associated with economic status. At the time of initial sampling, only one marble sarcophagus had been identified, containing a ~20-year-old woman with the highest nitrogen levels of the Medieval period and the second highest among all adults ($\delta^{15}N$ 11.6‰). This finding raises important questions about diet, burial practices, and social status. By characterizing the diet of this population from southwestern France, this study contributes to our understanding of how societies adapted as their socio-political and environmental contexts evolved.

Establishing forensic thresholds for kerf integrity in burned bone

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In response to pressure for standardization and validated practices in forensic anthropology, my research examines the structural integrity of saw marks and related features in burned bone. The Organization of Scientific Area Committees for Forensic Science (OSAC) has called for validated, replicable protocols in trauma analysis. However, there are no specific guidelines currently addressing the effects of heat on saw mark morphology. The acceptance of evidence often depends on proven and repeatable methods; the absence of standards causes considerable challenges for both casework and the credibility of expert testimony. To address this gap, my research looks at how progressive burning affects the preservation of kerf mark features in bone, to pinpoint the stages at which these marks lose their forensic value. We used mature sheep legs as proxies for human bone, and conducted controlled dismemberment with various saw types, including circular saw, reciprocating saw, crosscut saw, and rip saw. The legs were then burnt in stages, from carbonization to calcination, under outdoor fire conditions. Under high-resolution digital imaging using multiple light sources, the burnt remains will be analyzed, allowing for feature differentiation. Blue light will enhance surface striations, red light highlights textural contrasts in kerf walls, and polarized light reveals crystallinity changes along fracture edges. Complementary elemental analysis using portable X-ray fluorescence (pXRF) tracks calcium and phosphorus levels, since their relative concentrations reflect the degree of thermal alteration and may signal when microscopic features are likely to degrade beyond forensic usefulness. The goal of the study is to determine if these findings could guide the development of standardized protocols for interpreting tool marks in burned bone, improving both the reliability of the analysis and its acceptance in court.

Birth weight shapes resilience to kidney damage during ultra-endurance exercise

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Birth weight is strongly associated with organ functional reserve; that is, a component of somatic maintenance encompassing functional capacity beyond the bare minimum required for survival. In the kidney, low birth weight (LBW; under 2.5 kgs) is associated with fewer nephrons that must work harder to adequately meet filtration demands, reducing the buffer zone between increased

demand and kidney damage. Endurance exercise is one such key source of external demand that can elicit short-term damage known as Acute Kidney Injury (AKI), but we do not know if birth weight is an independent risk factor for exercise-induced AKI. In this study, we test the hypothesis that birth weight will shape risk of AKI among 44 adult ultramarathon athletes racing in either the heat or the cold. Birth weight was a strong non-linear predictor of AKI risk, explaining large portions of the variance in AKI and predicting outcomes with almost 80% accuracy, holding other predictors constant. All athletes with clinically-LBW exhibited AKI, regardless of whether racing in the heat or the cold, suggesting that early life investment in 'maintenance' in the form of costly renal functional reserve, reflected by birth weight, may universally provide immediate survival advantages under exercise-related stress as well as long-term health benefits.

A comparison of the inferences yielded by three different means of quantifying growth differences in archaeological samples

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A challenge of studying growth is how best to compare growth across past populations. Researchers have used different approaches including skeletal growth profiles (SGPs), ANCOVA analysis, and z-scores calculated using modern reference data. However, new methods for juvenile age estimation based on known-age individuals in historical populations are now available. These historical populations may serve as a reference sample for many ecologically diverse populations prior to the antibiotic era. This yields potential for expanding studies of growth in the past by examining discrepancies between dental and skeletal age across samples, regardless of chronological age. In this study, we compare the inferences about growth yielded by three different approaches applied to children under 12 years of age from three known-age collections: the Hamann-Todd (n = 23), the Lisbon (n = 85), and the Certosa Cemetery (n = 70) collections. We test the following approaches: ANCOVAs applied to raw femur length; ANOVAs and ANCOVAs applied to mean z-scores calculated for all available long bones using the Maresh data as a reference; and ANCOVAs applied to a new alternative method in which dental and skeletal age are calculated using the same reference population. We find different patterning of growth across samples for each of the three approaches yielding different interpretations. Differences in growth between samples are easily discernible using SGPs. Z-scores enabled identification of growth deficits relative to a modern population, but do not identify differences in rate of growth between the samples. The calibration approach revealed differences both in size and tempo between the samples. These three approaches represent theoretically and empirically different ways of

examining population differences in growth. Given that in archaeological samples, age is most often estimated by dental development rather than known, the calibration method may provide additional information on developmental progress not already captured by existing approaches.

The material culture of the accumulative stone throwing behaviour in wild chimpanzees (*Pan troglodytes verus*)

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In Boé National Park in Guinea-Bissau, a community of wild Western chimpanzees (*Pan troglodytes verus*) has been observed engaging in a potentially cultural behaviour: accumulative stone throwing (AST). Individuals repeatedly throw rocks at particular trees, resulting in the creation of AST sites recognizable by wound scars on the trees and the accumulation of rocks around the base and/or within the trunk. Although previous research suggests that AST may represent a cultural tradition playing a role in long-distance communication, aspects of its purpose and material culture remain unclear. The study area encompasses approximately 100 km2, with data collected during reconnaissance surveys by previous research teams in 2014 and 2017. New camera traps installed near and between preferred food trees and at increasing distances from AST sites supplement previous behavioural observations, permitting a wider perspective on the context of the behaviour. Videos will be used to determine how AST signals are influenced by features of the landscape, such as the presence of food trees, and/or by audience effects. Dendrochronological dating of wound scars from AST throws using a relative dating technique will provide time-depth for AST site use, and quantification of scarring frequency, size, and scar concentration on the tree will permit description of the perishable component of the behaviour's material culture. Finally, three-dimensional morphometric analyses and surface mapping will be used to quantify use-wear patterns on stones used for AST in order to distinguish them from unused stones. As an example of primate stone-tool use in a non-foraging context, AST has important implications for our ability to identify tool use in the archaeological record, and for our understanding of the origins of communicative tool use. Rare behaviours like AST also have implications for great ape conservation, by providing support for the maintenance of both cultural and biological diversity in endangered populations.

An analysis of the positional behaviour and substrate use of mantled howler monkeys (Alouatta palliata) in an anthropogenically fragmented forest

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Positional (postural and locomotion) behaviour of primates is typically described relative to the subjects' ecological environment and morphological evolution, largely determining reproductive success and survival through primate movement and access to food. This study examined the positional behaviour of three different age/sex classes of mantled howler monkeys (Alouatta palliata) within a fragmented forest to analyze the positional repertoire of these wild monkeys in relation to age/sex class and environment. In addition to positional behaviour, substrate details during behavioral contexts were collected to determine whether the role and degree of anthropogenic stress, displayed at the Estación Biológica La Suerte in Costa Rica, would limit monkey positional capabilities and substrate use. We collected behavioural data on positional behaviour, substrate size, and behavioural activity on individual focal monkeys for 110.5 hours in December-January 2024-2025 and June-July 2025. We collected data on adult male, adult female, and juvenile monkeys with instantaneous scans taken each 1min. The most common postural behaviour and its associated activity was sitting during rest across age-sex classes, while the most common locomotive behaviour displayed by adult males and juveniles was quadrupedal walking, and scrambling for adult females. Results showed that juveniles had the least versatility in both postural and locomotion behaviours, while adult males and females had greater variation. The reduced movement displayed by juveniles may be an indicator of both energetic restrictions via food scarcity in a fragmented forest, and inter-/intra-species competition. To provide insight into the potential impacts of anthropogenic activity and overcrowding in fragmented forests as well as other disturbed environments, further research is required to better understand the positional adaptations and development in varying age-sex classes of mantled howler monkeys.

Redefining cultural food: Exploring adolescents' food preferences in Southampton, UK

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Adolescence is an extended period of biological and social change where young people acquire increased agency that extends to their food choices. No longer navigating their food environment solely with their caregivers, youth become active consumers and have greater control over their dietary options. In our increasingly multicultural societies, there are new questions about what cultural food is, who has access to it, and how these categories are defined. When arriving in new countries, immigrants often aim to preserve their food practices to stay connected to their culture, but this does not always extend to youth. During my PhD fieldwork in 2023 in Southampton, U.K., I interviewed 87 adolescents in one-on-one and small group interviews, and three photovoice sessions. All participants completed a questionnaire with a youth-adapted food security survey. Based on these conversations, I explored the following: 1) How do young people make decisions pertaining to their diet and how does household food insecurity constrain their choices? 2) How do

free school meals and the school canteen shape these choices? 3) How does cultural background impact food preferences? While I anticipated to hear how school canteens primarily serve what is considered traditionally 'British' cuisine, I did not expect youth from multicultural households to also list these dishes as their favourite foods, e.g. fish and chips, Cornish pasties, and steak and kidney pie. In contrast youth mentioned how they enjoyed working in the kitchen because it provided them with the opportunity to spend time with and learn recipes from their family. These findings demonstrate how adolescents navigate a food culture informed by traditional family and English dishes. A traditional definition of 'British' food is often used to other cuisine from different cultures; I argue that listening to experiences of youth is critical to reimagining how we conceptualize cultural food.

Fecal proteomics of wild capuchins reveals impacts of season, diet, age, and sex on gut physiology

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Understanding how primate physiology responds to ecological stressors is a central concern of evolutionary genomics, but the constraints of non-invasive sampling have limited access to functional molecular data from wild populations. Here, we demonstrate that fecal proteomics can fill this gap by revealing how the gut responds to ecological stimuli at the cellular level in wild populations. We sequenced 45 fecal proteomes from 24 individual white-faced capuchins (*Cebus imitator*) from the Sector Santa Rosa population in Costa Rica, using LC- MS/MS with label-free quantification. We identified 394 host-derived proteins strongly localized to gut tissues and functionally enriched for digestive and immune functions, including 41 linked to seasonality, age, sex, and diet. Additionally, we quantified abundances of proteins from dietary fruit and insects, helminth gut parasites, and gut microbes, providing an integrated multi-omic profile of host physiology, diet, and microbial ecology. We show that non-invasive proteomics can complement population genomics by integrating cellular physiological data from wild primate populations, expanding the scope of molecular primatology. Our results demonstrate the viability of using

quantitative fecal proteomics in free-ranging populations of mammals to integrate host physiology, diet, and microbial ecology through non-invasive means.

Mice as models for human skeletal stress: Addressing challenges in bioarchaeological research

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Bioarchaeology investigates past human populations through the study of skeletal remains, with skeletal markers of physiological stress providing insights into responses to environmental, nutritional, and social challenges. These markers, observable as macroscopic changes such as porosity or irregular growth, are associated with diverse conditions including infection, trauma, circulatory and metabolic disorders, blood diseases, and autoimmune responses. However, ambiguity in their interpretation and the absence of detailed life histories for archaeological remains limit the ability to draw definitive conclusions about past health and lifestyle. Animal models have long advanced biomedical research by replicating human physiological processes under controlled conditions. Mice offer advantages due to genetic similarity, short lifespans, and ease of maintenance, yet their application in bioarchaeology remains limited. This study examines how skeletal mouse models may clarify the causes of skeletal stress markers. A sample of mice with documented physiological stress scores and life histories, aged 3–25 months, was examined. Femora were prepared as histological slides for gross structural analysis, and measurements of cortical thickness at the midshaft, femoral neck, and femoral head were recorded. Linear regression was used to assess the relationship between these measurements and physiological stress scores. Results showed that mouse femora exhibited human-like bone structures. Cortical thickness measurements showed a trend toward significance with physiological stress scores, suggesting a possible link between stress and bone morphology. Femoral neck and head measurements did not show a significant correlation. A larger sample size is needed to confirm these trends. These findings highlight the potential of controlled mouse models to inform interpretations of skeletal stress markers, offering a framework to bridge experimental studies with bioarchaeological research and improve understanding of the biological and environmental factors influencing past human populations.

Pregnancy, precarity, and production at a pan grave cemetery in Sheikh Mohamed, Gharb Aswan, Egypt

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Little is known of the Nubian Pan-Grave culture, a group of semi-nomadic desert dwellers who entered Egypt from southern regions during the political crisis of the Second Intermediate Period (c. 1800-1500 BCE). In 2018, the Aswan-Kom Ombo Archaeological Project (AKAP) uncovered a Pan-Grave cemetery (SM14) in Sheikh Mohamed, Gharb Aswan, Egypt, including Tomb 24, where an adult female individual aged 30–34 years and her unborn fetus were interred. They appear to have died shortly before or during delivery, as the fetal skeletal remains were full-term (39.3 +/ 2.08 weeks). The female individual exhibits several pathological conditions including severe anteversion (torsion) of both femora and new reactive bone on the left pubic symphyseal surface that may be related to complications shortly before or during the birthing process. The pair were wrapped in a leather shroud and buried with an Egyptian marl jar, Nubian black-topped bowl fragment, and more than 840 ostrich eggshell beads at various stages of production. Viewed through a bioarchaeology of care framework, the burial illuminates the life of a pregnant, possibly disabled woman who may have engaged in bead production. Situating this mother-fetus dyad within the broader epigraphic and iconographic record of the Nile valley, we underscore both the precariousness of childbirth and the lived experience of maternal mortality in the region.

Evaluating bone density in patients with peripheral nerve injury

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Peripheral nerve injuries can render an affected limb flaccid and insensate. Our rodent model has shown that there is a significant loss of bone mineral density (BMD) post-injury. Whether these injuries also lead to BMD loss in humans, has not yet been tested. This represents a major knowledge gap as untreated bone loss in an arm already lacking motor and sensory protection could increase the risk of fractures and further exacerbate functional decline. Thirty adult participants with a brachial plexus injury resulting in shoulder and/or elbow deficits were recruited. Each patient underwent full body DEXA scans and results from the injured arm were compared to those from the uninjured arm. Results revealed a significant decrease in both BMD (82±13%) and lean tissue mass (83±9%) and an increase in fat tissue mass (157±45%) in the injured arm. All changes began 1-year since injury and persisted over time. There were no differences in BMD between patients with motor recovery and patients with little to no motor recovery. Data indicated that male and female patients were classified to have either regional osteopenia (T-score between -1.0 and -2.5) or regional osteoporosis (T-score -2.5 and below). Patients with nerve injuries have

significant loss of BMD and lean tissue mass, accompanied by infiltration of fat tissue, in the region of their injury. These findings are persistent even in those with motor recovery and those who are 10+ years post-injury. This suggests that loss of BMD is not due to weakness or lack of arm use. Rather, recent data from animal studies show an intimate relationship between sensory and sympathetic nerves and bone turnover. This highlights the importance of early detection and early integration of osteoporosis management into the treatment of nerve injuries to prevent irreversible bone loss and to minimize the risk of fractures.

Recent lifestyle change impacts sleep and circadian rhythms among the Indigenous peoples of Peninsular Malaysia

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Sleep disorders are rising globally, but their lifestyle causes remain unclear. We recorded sleep-wake patterns via actigraphy from 1036 Orang Asli adults across 33 communities in Peninsular Malaysia undergoing market integration, marked by changes in permanent infrastructure (electricity and housing), digital technologies (smartphones), and labor practices (i.e., wage labor). We evaluated associations with sleep timing (onset, offset and regularity), quality (nighttime awakenings and waking after sleep onset) and quantity (sleep duration), while accounting for age and sex. Delayed and destabilized sleep timing was observed in communities with powerline access, also resulting in shorter sleep duration; paradoxically, it also improved sleep quality, suggesting increased homeostatic pressure. Age and sex were strong and consistent predictors of sleep variation: older adults had earlier, shorter, and more consistent, consolidated sleep patterns. Men displayed later and shorter sleep patterns than women, likely reflecting gendered divisions of labor among the Orang Asli. Despite averaging relatively few hours slept (6 hrs), Orang Asli exhibited relatively efficient sleep, potentially challenging the notion that longer sleep is universally

beneficial. These findings underscore the complex interplay of biology, ecology, and culture in shaping sleep and circadian rhythms.

Are ethics in danger of becoming a new gatekeeping tool of neocolonialism in research

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What is considered ethical is historically bound and ever changing, it is situation specific and will of course vary from one locality to another. This paper is a very personal view of the ever-changing dilemmas on ethics of research in my field of research: palaeoanthropology, biological anthropology, bioarcheology or any archaeological research including skeletal remains of past human populations, burials and the associated material culture. Rather than passing judgements on fellow scholars --- as I firmly believe that the lapses in ethical behaviour stem from lack of reflection on the issue, succumbing to the cultural and academic norms and pressures --- it is supposed to warn against **imposing** the current western approach to ethics when working in international settings. This presentation looks at more than 30 years of my involvement in multidisciplinary international projects in the field, from an undergraduate team member to the current role most often as a principal investigator, as a very personal quest for ethics and how they pertain to colonial power imbalances in our field. In an increasingly neocolonial world, we need to pay attention to how our best intentions and principled approaches can negatively affect the people we are working with and for. As Principal Investigators on grants (often the only source of funding), Canadian scholars need to strike a fine balance between their different roles, and guard against inadvertently using *ethics* as yet another tool of oppression and colonization.

Decision-making in bioarchaeological research design: Reflections from a multi-step, team project

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Many, if not most, bioarchaeological projects involve teams of people making contributions over several stages (steps, phases) in a research project. At every stage, a desire to hold ethics at the forefront can (and should) structure the decision-making process. Here we discuss the decision-making that unfolded in a study of fragmentary Holocene burials from the Turkana Basin, Kenya, and reflect on our efforts to make appropriate research design decisions that limit destruction while still answering major research questions. This paper unpacks the choices made in selecting teeth for destructive sampling, outlines the rationale for a staged approach to analyses, and reflects on lessons learned so far. We share preliminary results from imaging and histological

analyses (see also submitted abstract of Harrington et al.), and discuss how these results direct our efforts as we move toward the end-stages of the project.

From fields to fauna: Isotopic perspectives on Iron Age subsistence at Non Ban Jak, Northeast Thailand

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Agriculture was a central driver of biological, social, and cultural change in Mainland Southeast Asia during the Iron Age (IA). This study presents new isotopic evidence from human and faunal dental enamel at Non Ban Jak (Upper Mun River Valley, northeast Thailand) to assess diet, agricultural practices, and access to resources. $\delta^{13}C$ values indicate consistent reliance on C_3 crops, especially rice, with reduced variability relative to the Bronze Age, suggesting a more uniform IA diet. A broader $\delta^{18}O$ range reflects changing water use, likely tied to irrigation systems and monsoonal variability. No significant dietary differences were observed across social or biological groups, pointing to broadly equal access to resources. Comparative faunal enamel values indicate continued use of domestic animals alongside wild resources, situating human diets within a broader subsistence economy. Together, these results highlight the intensification of irrigated rice agriculture in the IA UMRV and its role in shaping subsistence and social organization.

Sample size requirements for estimating the population correlation coefficient (ρ): Results from a preliminary analysis using random resampling of variables from Howells data set

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The Pearson correlation coefficient is used extensively in biological anthropology to estimate the magnitude of association, or linear relationship, between two variables (X & Y). The Pearson population correlation coefficient (ρ), which is considered the true magnitude of association between X and Y, and is typically unknown, is estimated by the Pearson sample correlation coefficient (r). Previous research has shown that how well the sample correlation coefficient r estimates the population parameter ρ depends on both the sample size (n) and on the magnitude of ρ, such that the sample size needed to estimate ρ accurately increases with decreasing

magnitude of ρ. Here, using random resampling with replacement of variables from Howells craniometric data set comprising 1368 observations (males), we generate probabilities that the sample estimate r is within ±5%, ±10% or ±20% of the population parameter ρ based on a range of sample sizes, where ρ is represented by the observed correlation between variables in the data set. These probabilities represent the degree of confidence one has that the sample estimate r is within the desired fraction of the population parameter ρ based on the sample size n. Our results show that required sample sizes varied widely. For example, a sample size of n>1000 was needed when ρ=0.1079 and the desired accuracy was ±20% with a confidence of 0.80 (80%), but a sample size of only n=8 was sufficient when ρ=0.9788 and the desired accuracy was ±5% with a confidence of 0.949. Overall, our results suggest that required sample sizes needed to estimate the true correlation between variables are likely greater than researchers assume when the magnitude of association between variables is likely to be low to modest (e.g., ρ ≤ 0.70) and the desired accuracy and confidence in the estimate is high (±5% or ±10% with 95% confidence).

A lemon a day keeps the hemorrhagic lesions away, but what else? Mechanisms underlying ascorbic acid's role in skeletal integrity.

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Responding to calls for less reliance on comparative diagnostic approaches, paleopathology is shifting toward epistemological frameworks that ground analyses in the biological processes underlying bone lesion formation. This poster examines the relationship between scurvy (ascorbic acid [AA] deficiency) and its impact on biopathophysiological mechanisms affecting skeletal tissues. Paleopathological approaches tend to emphasize AA deficiency primarily through its impact on vascular fragility, hemorrhage, and subsequent inflammatory skeletal lesions, visible macroscopically. Studies of scurvy, however, could benefit from a better understanding of the cellular effects of AA deficiency. This synthesis combines paleopathological studies and clinical research on contemporary populations and animal models to highlight relevant biopathophysiological pathways and inspire new methods for investigating scurvy archaeologically. AA directly regulates osteoblast and osteoclast differentiation, influencing bone formation and affecting bone matrix gene expression. As an antioxidant, AA limits osteoclast-driven bone resorption by neutralizing free radicals and reducing oxidative damage. AA also promotes bone formation through its function as a signalling factor, by upregulating the transcription factor osterix, which drives the differentiation of bone marrow stromal cells into mature osteoblasts. Thus, AA deficiency can lead to osteopenia and osteoporosis. Histological changes that may be visible include reduced cortical cross-sectional area, cortical bone porosity and trabecularization, or lower Haversian canal density. Additionally, animal studies have demonstrated that AA deficiency is detectable through metabolomic approaches targeting serum-derived signatures such as

reduced carnitine levels. AA is required for carnitine biosynthesis, and low levels occur due to insufficient transport of fatty acids to the mitochondria, resulting in impaired energy metabolism. Research is needed to establish whether carnitine and other metabolite levels can be reliably measured in skeletal tissues and if values are preserved in archaeological contexts. Recognizing that AA deficiency alters skeletal biology beyond vascular changes broadens our understanding of scurvy, allowing for the integration of multiple detection techniques.

Standards don't apply: Impacts of context-specific preservation on methods of sex determination for recovered First and Second World War soldier remains

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Around the world, the remains of missing and unaccounted for Canadian service members from the First and Second World Wars are found every year. The Commonwealth War Graves Commission (CWGC) is tasked with the recovery and initial assessment of identification for our soldiers, along with their burial. Although the CWGC is on the front lines of the recovery efforts, identification remains the responsibility of the country the service member came from. In Canada, this is the Canadian Armed Forces Casualty Identification program (CASID). Sex estimation is a key component of the osteobiographical sketch, and the all-male service population provides a rare opportunity to test a variety of methodologies. The nature in which the service members fell along with local taphonomic conditions lead to unique preservation and recovery that may require a specific suite of methods to best complete an osteobiography. This creates a situation where novel techniques might play an outsized role in sex estimation compared to more common and well-established methods. This presentation provides an overview of the nature of the recovered remains from these contexts, and the impact on the use of various morphological and metric methods of sex determination from skeletal remains. This research provides the CASID program with key data to increase the understanding of the population and accuracy of their methods.

Maternal subjective social status in rural Nicaragua: A mixed-methods analysis of cultural and economic factors

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Background: Across cultures, women, especially mothers, experience disproportionate levels of inequality, often manifesting in relatively poorer health outcomes. One measure of inequality, socioeconomic status (SES), is strongly and positively associated with maternal health. Recently,

subjective social status (SSS), one's perceived rank relative to others, has been found to better predict health outcomes than objective SES measures (OSS), such as income and education. Indeed, in the rural community of Los Robles, Nicaragua, SSS was found to positively correlate with maternal mental health (MMH). However, the variables that people use to determine their SSS are poorly understood. Objective: This mixed-methods study investigates how maternal SSS is perceived and assigned within Los Robles. It is hoped that this will, in turn, inform a better understanding of the determinants of MMH. Methods: Quantitative analyses drew on cross-sectional data from 236 mothers, assessing factors associated with maternal SSS, including household wealth (HHW), education, household food insecurity (HFI), MMH, and perceived social support (PSS). Ordinal logistic regression modelling tested the hypothesis that psychosocial factors (HFI, MMH, PSS) would be more strongly associated with SSS than OSS (HHW, education). Qualitative data were collected through ethnographic fieldwork and interviews with 16 mothers to explore the context-specific dimensions of SSS. Interview data were analyzed using thematic analysis to complement and provide depth to the quantitative results. Results: Quantitative and qualitative analyses found that OSS factors, HHW (COR: 1.10; 95% CI: 1.04, 1.16), and income were positively associated with SSS. PSS had the strongest association with SSS, with a one-unit increase associated with an 84% higher likelihood of higher SSS (COR: 1.84; 95% CI: 1.34, 2.54). Conclusions: Qualitative findings demonstrated further support for interpersonal relationships, self-esteem, and religiosity affecting SSS independent of OSS. These findings indicate that psychosocial factors, alongside OSS, influence how maternal SSS is perceived in Los Robles.

Assessing spatial and behavioural risk factors for zoonoses in lemurs

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Lemurs are the most endangered group of animals in the world and share a landscape with a human population faced with a limited access to clean water, sanitation, and hygiene. Previous studies have reported increased detection of gastrointestinal pathogens in lemurs living in disturbed forests compared to those living in intact forests. However, factors influencing pathogen acquisition in lemurs are poorly understood. In this study, I conducted full-day group follows to measure behavioural risks for acquiring gastrointestinal parasites in two groups of Propithecus coquereli and two groups of Eulemur fulvus; one of each living near and far from a community, within the Ambanjabe Field Site in Ankarafantsika National Park. The presence of human and domestic animal feces and other signs of human disturbance were measured in 10% of each group's home range to characterize the relative environmental risk of parasite infection across groups. I collected fecal samples from each group to ascertain parasite egg count and diversity. This study design enables measuring the effect of proximity to a human community on a specialist

species and a generalist species. Preliminary results indicate numerical differences in risky behaviours between species and between near and far groups, and significant differences in spatial risks present in the home ranges of Eulemur fulvus groups vs. Propithecus coquereli groups, but not between near and far groups. The study identifies important nuances in land-use patterns that do not strictly adhere to the political boundary of the human community. Characterizing these nuances will improve our understanding of the factors influencing pathogen acquisition, and the impact of gastrointestinal pathogens on lemur population dynamics, as well as providing insights to pathogen transfer to human communities in Ankarafantsika National Park.

Correct, partly correct, and incorrect: Assessing patterns of utility for an age estimation method using only the retroauricular area of the ilium

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In previous research we have presented evidence that the retroauricular area, the general area immediately posterior to the auricular surface, is a reliable indicator for age estimation in cases involving a broad range of ages at death. In said research, logistic regression classified individuals into three age groups according to the morphology of their retroauricular area. These groups comprise younger (20-39 years old), middle (40-65), and older adults (66+). A data collection protocol for this feature was designed to ensure that methodology was consistent, explicit, and straightforward. This method was tested in a group of 119 individuals from the Terry Collection at the Smithsonian Institution's Museum of Natural History, selected through stratified sampling to ensure balanced representation by sex and age. Accuracy of this analysis was recorded as 53%. However, introducing the concept of "partly correct" information circumvents this issue while maintaining simplicity and ease of data collection and method applicability. A "partly correct" classification eliminates one of the three age groups with certainty and accuracy, even though it cannot provide a correct classification between the remaining two age groups. Information deemed as "partly correct" was obtained in a further 33% of the cases. Only then 14% of the cases were incorrect or indeterminate. This information still narrows down the estimation, including real-case scenarios that could be implemented according to the practitioner's best judgement. With only two scoring areas, this protocol is simple to apply, requiring minimal training while still providing coarse but accurate estimates of age. Other age estimation methods typically display the opposite pattern, in which younger and/or older adults are misclassified. In contrast, this approach is not useful for estimating age of middle-aged individuals.

Those remembered & forgotten: Uncovering the lost dead of the Klondike Gold Rush, archival research and beyond

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As an archaeologist who has experience working in Klondike Gold Rush, internment and residential school contexts, I am sometimes asked how all of these topics could possibly relate to one another. The short answer is that they are all informed by archival research, made challenging through the loss and degradation of associated records, material culture and sites. In cases such as these, where there has been intentional or natural occlusion or loss of mortuary landscapes, archival research is the most basic starting point and one of the most significant sources of information for narrowing down a search and clarifying the results obtained through techniques such as subsurface detection and excavation. A form of research that, unlike most, can be undertaken by and benefits from the investigations of experts and community members alike. Among other things, we consider census records, newspapers, journals, maps, diaries, photographs, and sacramental records. But what happens when, as in these cases, the written record has, in part, been lost, destroyed, suppressed, or its reliability is in question? We dig deeper, we spread the net wider, and we get creative, moving beyond the bounds of what might be considered traditional archival research, relying solely on primary documentation. A conscientious researcher might make use of internet archaeology, digital repositories like the Internet Archive, genealogy sites, cemetery databases and forums, spaces built and curated by dedicated community members and independent researchers. What was once thought to be lost might be found anywhere, and, in the world of today, it will inevitably end up online. By actively pursuing all avenues, traditional and non-traditional, archival research remains an invaluable tool in complex situations such as these, aiding in the relocation of the lost dead and understanding how they came to be, whether they be prospectors, internees, or children.

Are we adequately accounting for diagenetic lead contamination in archaeological skeletal remains?

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Within trace element analysis studies of lead in skeletal remains, the possibility that diagenetic lead from the postmortem environment has entered a bone or tooth sample and overprinted the biogenic (lifetime) concentration of skeletal samples is a core methodological limitation. The following premises have often guided bioarchaeological approaches addressing the possibility of

diagenetic lead contamination: (1) Enamel should be preferentially sampled because it is less susceptible to diagenetic alteration than bone; (2) Mechanical abrasion of samples removes surface contaminants; (3) Other aspects of diagenetic alteration (e.g., maximum threshold concentrations of “diagenetic” trace elements, histological preservation indices, crystallinity indices, mineral or collagen content ratios) are linked to diagenetic lead contamination and can be used to screen samples. Our larger investigation of lead exposure in Greece during late antiquity (3rd to 7th centuries A.D.) involved generating element maps of bone and tooth sections with synchrotron radiation-micro-X-ray fluorescence imaging (SR-μXFI), allowing us to pinpoint diagenetic lead contamination with high spatial resolution and test these premises. Our results challenge some of the above premises. We identified cases of extensive diagenetic alteration of enamel and cases where contaminants diffused past the threshold of mechanical abrasion in bone and tooth samples. We also failed to find a clear association between many common diagenetic parameters and diagenetic lead contamination. Overall, we advocate for comprehensive approaches in screening samples for diagenetic alteration and for the increased use of element mapping approaches to inform bulk sampling strategies.

Restitution in practice: Reflections on the Medicine Hat Ancestors Reburial Project

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While the ethical landscape that underpins human osteology teaching collections continues to evolve, the University of Alberta Department of Anthropology continues to work with Indigenous communities and partners as part of the Medicine Hat Ancestors Reburial Project (MHARP). With the goal of the respectful reburial of three archaeological human Ancestors who have been cared for in trust within the department’s Osteology Collection since 1967, the MHARP team has been collaborating with Indigenous descendant communities to consider the complexities and pathways for returning the Ancestors to the land. As the reburial of the Ancestors approaches, the project team, comprised of members from the University of Alberta, Miywasin Friendship Centre, and the City of Medicine Hat, reflect on 1) the principles that guided the MHARP, 2) the challenges encountered, and 3) the lessons learned when facilitating the community-led reburial process. It is the hope that in sharing the story of the MHARP, institutions considering restitution of remains or cultural items will appreciate, anticipate, and prepare for the considerations discussed with the understanding that positive outcomes require inclusivity, flexible timelines, supportive partnerships, cultural guidance, and human empathy. Teachings from the MHARP are related back to how the University of Alberta community is working to reimagine the vision and mission of the department teaching collections to support a contemporary discipline.

Cultural protocols and biomolecular tools: Exploring the use of ZooMS for Ancestral Remains identification.

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Zooarchaeology by Mass Spectrometry (ZooMS) is a biomolecular method that identifies archaeological bone through collagen peptide fingerprinting. While originally developed for faunal analysis, ZooMS also offers a rapid and cost effective approach for determining whether highly fragmented or morphologically ambiguous remains are human. The ADαPT lab at UBC has worked in partnership with First Nation communities to develop culturally sensitive laboratory protocols and minimally invasive sampling approaches, striving for respectful and collaborative research practice. Together, we have worked to establish laboratory practices that emphasize minimally-invasive sampling, spiritual safety, and community decision-making. This presentation will reflect on both the technical possibilities of ZooMS for identifying human remains and the cultural protocols that have been developed through collaboration. By combining methodological innovation with cultural protocols, ZooMS can serve as a tool for supporting Indigenous-led heritage stewardship in BC.

Not extinct yet: Mechanisms driving species-area relationships in lemurs.

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Our study aimed to determine how the shape varies and mechanisms influence species-- area relationships within the same taxon but between different ecoregions Location: Madagascar. Taxon: Arboreal mammals (lemurs). We surveyed arboreal mammals (lemurs) in 42 tropical dry deciduous forest fragments in Ambanjabe Field Site in Ankarafantsika National Park in Western Madagascar and 27 primary mid-- elevation rainforest fragments in the Tsinjoarivo-- Ambalaomby new protected area in Eastern Madagascar using line-- transect methods. We determined which of 20 species-- area models were the most likely using the ‘sars’ R package and AICc in each ecoregion. We assessed what drove the shape of the SARs using the Measurement of Biodiversity framework. We found that SAR models differed between ecoregions, with the power model (AICc = 89.04) as the most likely in the west and the Monod model (AICc = 86.98) followed by three candidate models (Kobayashi, AICc = 87.02; logarithmic, AICc = 87.6; and negative exponential, AICc = 88.61) in the east. Spatial aggregation of species drove species richness patterns in the

west, and species diversity and evenness drove species richness patterns in the east. Our study demonstrates that while the power and negative exponential model are good starting points, other models are also likely models to describe SARs in arboreal mammals such as primates. These patterns can reflect different mechanisms driving SARs.

Domain, density, depth, and diameter: A concise method for grading cribra orbitalia in Early Neolithic and Chalcolithic juvenile individuals from the Central Zagros Region

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This research was conducted with the objective of devising a new method for grading cribra orbitalia in order to explore the severity and cause of the lesions. This new method allows for concise and consistent comparison of the lesions between sides and among individuals. This study was conducted on two genetically linked groups of juvenile individuals in the Central Zagros region of Iran. One group were very early goat herders in an optimal region (Ganj Dareh, 10,100 Cal. BP) while the other group were intensive agriculturalists in a marginal region (Seh Gabi, 6,000 Cal BP). This research was performed through the examination of the orbital bones for cribra orbitalia. Pores of the lesions were then graded by location on the orbit (domain), density, depth, and individual pore diameter. This was done to quantify the severity of the porosity for analysis and comparison, as well as to make a cursory hypothesis about the causative metabolic disease (anemia or scurvy). Supplementary analysis of additional non-specific indicators of stress was conducted to support further conclusions regarding the possible diseases present. This study found evidence of cribra orbitalia in 45% (9/20) of the Seh Gabi juvenile individuals compared with 11% (1/9) of those from Ganj Dareh. These numbers support claims that Chalcolithic agricultural societies had increased rates of metabolic bone diseases relative to Early Neolithic goat herders. Moreover, this grading method allowed for additional comparisons, such as that 56% (5/9) of the individuals that have both left and right orbits present for analysis share the same grade in three of the four (3/4) categories; this suggests that the condition of one orbit is a reliable reflection of the condition of the other orbit.

Research and collaborations in primate genomics across borders

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In an era of increasing global connectivity, collaborative research in primate genomics offers unprecedented opportunities to advance our understanding of evolutionary biology, conservation,

and species resilience. This presentation explores the challenges and successes of conducting cross-border genomic research on primates, drawing from the coordination of fieldwork and laboratory activities across Latin America, Africa, Asia, and North America. Focusing on species such as white-faced capuchins (Cebus capucinus), howler monkeys (Alouatta spp.), and lemurs (e.g. Varecia variegata), we will highlight how international partnerships, ethical compliance, and logistical coordination have enabled the collection, transport, and analysis of genetic samples under diverse regulatory frameworks, including CITES and CFIA. The presentation will showcase studies from collaborative projects involving institutions in Costa Rica, Mexico, and Peru, emphasizing the role of multilingual communication, field safety planning, and genomic technologies in facilitating conservation-oriented research. We will also discuss the importance of inclusive training environments and capacity-building for students and early-career researchers in genomics and primatology. By sharing insights from the administrative complexities of managing international research budgets, navigating international permits, and mentoring diverse teams, this presentation aims to foster dialogue on best practices for ethical and practical cross-border collaborations in biological anthropology.

“My ancestors are dancing”: Theorizing self-identities, biological affinities, and inheritance in the 21st century using Two-Eyed Seeing.

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While completing my Master’s research exploring craniofacial variation in a living Western Canadian Indigenous population (n = 10), it became apparent that the census-style model of collecting ancestry data by having participants self-select identifiers from a checklist does not effectively account for the external factors that inform self-identity. This left me with a key study design problem to solve: how can I collect, translate, and analyze biogeographic ancestry data in a way that is scientifically robust and respects Indigenous views of community, identity, self, and belonging? Participants in my project were invited to write about themselves and where they come from using whatever strategies felt most appropriate to them and were later prompted to select which geographic region(s) of the world they most closely associate with their ancestry. Many chose to share family names, personal stories, and communities and ancestors they feel connected to which led to wider discussions about status under the Indian Act (R.S.C., 1985, c. I-5), “pretendians”, concerns over thinning blood, and small choices they make about the details they share while introducing themselves. This presentation will discuss the practice of Two-Eyed Seeing as it applies to biological anthropology and how relationality can be applied in future study designs as an indigenist research framework.

Behavioural responses to challenging circumstances: Field research on flexibility in *Macaca fuscata* and *Sapajus* spp.

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Understanding the drivers, expressions and limits of behavioural plasticity – the ability of animals to modify their behaviours flexibly according to their circumstances – is a key for anticipating animal resilience in the face of rapid human-induced environmental change. Our research focuses on behavioural plasticity in response to challenging circumstances in wild and free-ranging nonhuman primates, and links these behavioural responses to larger-scale ecological changes and pressures. We integrate animal behaviour data collection with technological approaches, like digital mapping and modeling, in three main study systems: 1) A free-ranging population of Japanese macaques (*Macaca fuscata*) at the Awajishima Monkey Center (AMC) in Japan; 2) Bearded capuchin monkeys (*Sapajus libidinosus*: Near Threatened species) in rescue facilities and reintroduction settings in northeastern Brazil; and 3) Blond capuchin monkeys (*Sapajus flavius*: Endangered species) in an Atlantic Forest fragment surrounded by industry and agriculture. We investigate the “necessity drives innovation” and “plasticity reduces extinction risk” hypotheses, by examining individual behaviours and changes in space use and group dynamics in these systems. Here, we discuss three examples of our research that contribute to the overarching investigation of behavioural plasticity: individual compensatory behaviours in physically impaired Japanese monkeys; use of forest strata by different age/sex classes of blond capuchin monkeys; and rehabilitation and release of bearded capuchins. With the UN Decade of Restoration, and a global focus on biodiversity conservation, data on how individual animals adjust their behaviours to compensate for challenging circumstances – such as living with physical impairment and disability, or living in small habitat fragments, or learning to live in the wild after rehabilitation and release from captive environments – informs efforts to understand and mitigate negative impacts of human-induced environmental change.

Evaluating the effectiveness of talar geometric morphometrics for sex estimation in a South African population

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Introduction: Accurate sex estimation is vital in forensic/biological anthropology for identifying missing persons and reducing case backlogs. In South Africa, with high violent crime rates and 7–10% unidentified remains, many are recovered fragmented or incomplete. Pelves and crania, though most reliable for sexing, are often absent or damaged. Dense bones like the talus survive taphonomic processes, making them useful alternatives. This study assesses talar sexual dimorphism using 3D geometric morphometrics to develop population-specific standards for improved sex estimation. Methods: A total of 300 individual samples were used for this study, with ethics approval obtained (HREC REF: 988/2023). 3D digital models of each talus were obtained using a 3D surface Artec scanner (resolution: 0.1 mm, accuracy: 0.05 mm). Meshes were processed in the Viewbox dHAL software for landmarking. Statistical analyses were conducted using R software, with significance assessed at $p \leq 0.05$ and shape was visualised using a wireframe diagram.Results: Significant shape differences were found between sexes in pooled and ancestry-specific samples ($p < 0.001$). Sexual dimorphism was partly allometric, with centroid size explaining 34% of shape variance. Males had larger tali (ANOVA: $F = 150.7$, $p < 0.001$). PCA revealed that the first four PCs captured 43.6% of shape variance. DFA achieved 82.7–91.4% correct classification. Morphologically, females exhibited a slender talar body, longer neck, and more laterally tilted trochlea, whereas males showed a more posteriorly elongated talus. Among ancestries, SAEA exhibited the largest centroid sizes. Conclusion: This study provides the first 3D GM analysis of South African tali, revealing clear sexual dimorphism and moderate allometric effects. The high classification accuracy underscores the value of GM for forensic identification and demographic research. These findings improve understanding of talar variation and may have implications for both forensic practice and clinical studies on lower-limb biomechanics.

In obtaining population-specific data for sex estimation, how reliable is the use of three-dimensional computed tomography (3DCT)? A study conducted on the humerus of South African Blacks (SABs)

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Human identification is an integral part of forensic and biological anthropology. Biodata information such as age, sex, ancestry, antemortem stature, and factors of individualisation obtained from recovered skeletons in forensic cases are used in the construction of the biological profile of the deceased. Of particular importance is the estimation of biological sex, which can help unravel other anthropological parameters. South Africa has a multi-dimensionally high crime rate, and its largest distinct population group, i.e. SABs, is most affected by such crimes. Several authors

have used measurements of the humerus to carry out sex discrimination among South Africans, with such attempts largely confined to direct assessment of post-mortem specimens or limited to the study of subjects of European Descent. This study, therefore, attempted to overcome the drawbacks of direct osteometry on post-mortem and chronologically older subjects by using a non-invasive method, the 3DCT, to obtain population-specific data from a contemporary Black South African population group. Measurements were obtained from premortem humeral CT records of 97 Black South Africans (M=64; F=33, age range = 18-60 years) housed in the Radiology Department of the Charlotte Maxeke Johannesburg Academic Hospital. The Xiris and IntelliSpace software were used to reconstruct three-dimensional (3D) profiles of the isolated humeri from which a combination of linear measurements was obtained. The percentage accuracy of previously published equations derived from humeral measurements of the same population group yielded low average classification accuracies (73.5% - F = 57.6; M = 89.4) when tested using the current study. Discriminant function analyses yielded acceptably high average classification accuracies for sex estimation, which ranged from 83.5% to 90.7%. These results indicate that the CT-derived measurements' functions in the current study are reliable in the estimation of the sex of contemporary SABs. The high average classification accuracies show that the humerus has a high sexual dimorphism and as such, relevant to forensic applications.

Stone tool-use rehabilitation for the improvement of releasability and welfare in captive robust capuchins (*Sapajus* spp.)

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Rehabilitation protocols for rescued captive primates should enhance welfare while fostering species-typical skills relevant for post-release survival. We evaluated the effects of a nut-cracking enrichment protocol on the behavior of captive capuchin monkeys (Sapajus spp.) at a rescue center in Cabedelo, Paraíba, Brazil. Our objective was to decrease stress-related and negative social behaviors while increasing manual manipulative foraging skills and positive social behaviors. During a two-week baseline period, we recorded afternoon behaviors using an ethogram previously developed by the COLAB (UFRN) for similar research. Each individual was then provided with five Macaíba nuts (Acrocomia aculeata, ~44g each) three days per week. This nut species is naturally exploited by wild capuchins using stone tools, making it ecologically relevant. Hammer stones (~2.4 kg, one per individual) and anvil stones (~15kg, two per group) were introduced simultaneously and remained accessible throughout the protocol. After three weeks, one quarter of the nuts were experimentally pre-opened to demonstrate the presence of an edible kernel.

Observations continued five days per week across the study period. Results indicated no significant change in stress-related behaviors ($t = -0.63$, $p = 0.54$). Social interactions showed non-significant trends of increased positive ($t = -0.88$, $p = 0.39$) and decreased negative behaviors ($t = 1.42$, $p = 0.19$). In contrast, manual manipulative foraging behaviors increased significantly across the population ($t = -7.11$, $p < 0.001$), with especially strong effects in adult males and females. We also detected group-level differences in manipulation rates (ANOVA, $F = 9.85$, $p = 0.0017$). These findings indicate that nut-cracking enrichment can promote the development of manipulation skills critical for survival, while also suggesting promising welfare-related trends. Such protocols represent a critical step in preparing rescued capuchins for successful reintroduction as well as improving the living standards of those who remain in rescue centers.

Before the data: From connection to refining the lens in Dominican Republic food insecurity research

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In order to both share the experience of conducting fieldwork in a community and elicit discussion from others on the topic, this presentation reflects on the early stages of a research project investigating food insecurity in a low-income urban area of Santo Domingo, Dominican Republic. Through two exploratory fieldwork seasons in 2024 and 2025, and a literature review, the project aims to contribute to a deeper understanding of food insecurity lived experiences in Caribbean and Latin American urban contexts. Fieldwork seasons have highlighted important takeaways. First, resilience and adaptability proved to be essential, as fieldwork revealed the local context that required logistical adjustments for which community engagement is both essential and demanding. Second, collaboration is rarely straightforward and needs alignment of goals and expectations between the interested parties. Third, ethics clearance can be a practical challenge that requires extensive time and adjustments to meet institutional requirements before data collection begins. The experience in seeking to develop a project in this low-middle-income country could be instructive for others planning to embark on a similar journey. This could also be a good opportunity to receive feedback from those with more experience with such research before data collection begins. The research process itself is an object of reflection, and methodological components are currently being refined through field-based insights, community feedback, and literature review.

Later molar development presents alongside wisdom tooth impaction in post-industrialized English non-adults

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Wisdom tooth impaction occurs when a third molar (M3) fails to erupt into occlusion properly. The etiology of M3 impaction is multifactorial; non-adults with smaller jaws and later-forming molars are at higher risk for impaction. During growth, diet texture and vitamin D level may influence jaw shape and molar development timing, thus affecting M3 impaction. During industrialization in England, diet texture softened and vitamin D levels decreased. We hypothesized that a harder diet and higher vitamin D support jaw growth and molar development. Pre-industrial non-adults were predicted to have smaller jaws, on-time molar development, and fewer impacted M3s compared to post-industrial non-adults. Pre- (ca. 800-1600, n=52) and post- (ca. 1711-1857, n=54) industrial non-adults aged ~7-20 years old from the Universities of Bradford, Durham, and Sheffield were included in our study. We scored first molar wear to compare relative hardness of diets. Nine jaw measurements were also collected, and molar mineralization was scored from dental radiographs using a modified Demirjian system. We estimated biological age using osteological fusion to compare pre- and post-industrial non-adults of similar cohorts. Kruskal-Wallis tests, Mann-Whitney tests, and Analyses of Covariance were done with PAST 4.0 software. Compared to the post-industrial group, first molars were more worn in the pre-industrial group ($p<0.02$). Also, the pre-industrial group had slightly longer mandibles later in adolescence ($p=0.05$), with narrower bicondylar breadth ($p=0.04$) and mandibular arch breadth ($p=0.05$). Pre-industrial M3s developed earlier relative to osteological development ($p=0.02$) and were less often impacted ($p<0.01$). These findings support that industrialization increased risk of M3 impaction via later M3 development compared to osteological development, linked to a softer diet and lower vitamin D levels.

Reassessing gender in Andean mummy bundles: Mortuary practices on the central coast of Peru

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Archaeological interpretations of gender in the Andes have long been shaped by colonial and Western binary frameworks that equated biological sex with specific labour roles and ritual functions. These frameworks assigned textile tools to women and technical or metallurgical artifacts to men, often erasing more fluid or complementary gender roles central to Andean cosmology. While much scholarship has focused on the North Coast and Highlands, the Central Coast remains comparatively understudied, despite its rich tradition of elaborate mummy bundles. This project examines mortuary practices from Pachacamac, Huallamarca, Huaycán de Pariachi, Ancón and Puruchuco to explore how gendered identities were constructed, negotiated, and

commemorated through burial. Non-destructive methods, including CT scanning and radiography, are being used to document the placement of artifacts, the structure of bundles, and associated skeletal remains. Artifacts are categorized by type (e.g., textile tools, metal objects, ritual goods), and their spatial distribution is analyzed in relation to biological sex, age, and inferred status. By integrating bioarchaeological analysis with gender theory, queer theory, and intersectionality, this study aims to reassess whether Central Coast mortuary practices reinforced binary gender categories or reflected more fluid, context-dependent roles. Particular attention is paid to items such as tupu pins and Spondylus shells, whose distributions across sexes suggest meanings tied more to status and ritual than to gender alone. Preliminary results highlight regional variation in artifact associations and complicate assumptions of strict gendered labour divisions. This research contributes to decolonizing Andean mortuary archaeology by foregrounding Indigenous concepts of duality and fluidity, while also demonstrating the potential of non-destructive imaging technologies for the ethical study of culturally sensitive remains.

Conservation education of adolescents in southern Madagascar: Regular conservation club meetings impact expressed learning from field trips.

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Field trips to see wild primates are known to be important conservation education tools for adolescents living in primate source countries. We surveyed three groups of adolescents (ages 12-18) before and after a field trip to see wild lemurs at local reserves in Madagascar. Surveys investigated whether membership in a conservation club impacted expressed learning from field trips, and adolescents were either 1) members of a conservation club for two or more years and from a town (Sampoana, n=14), or new members of a conservation club and from 2) a city (Fort Dauphin, n=21), or 3) a village (Berenty, n=14). We predicted that adolescents would learn about lemurs and conservation during the field trip, and would demonstrate this by answering more survey questions correctly and in greater detail after the trip. We further predicted that adolescents who had been members of a conservation club for at least two years (town group) would answer more survey questions correctly and in greater detail than adolescents who were new members of a conservation club (city and village groups). We found that adolescents provided fewer correct answers about lemurs but significantly more correct answers about conservation ($p<0.001$) in surveys completed after the trip. Adolescents who had been long-term members of a conservation club also answered significantly more survey questions correctly overall ($p<0.001$), and also significantly improved their number of correct responses after the trip ($p<0.001$) unlike the village or city respondents. We conclude that long-term membership in a conservation club prior to a field trip to see wild lemurs enhances the learning that occurs on such a trip.

Disease control or simply pets: Domestic cats as animal technologies used by the Schreiber family

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During excavations for the Schreiber Wood Project (University of Toronto Mississauga), two accumulations of small faunal remains were identified. One accumulation of bones was found amongst the foundation of a barn (n=57), and the second was found surrounding a structural footing on a small out-building (n=173) on the late-19th and early-20th century homes of the Schreiber family. The location and array of taxa represented suggests the accumulations were formed by a small predator, likely domesticated cats (Felis catus). Additionally, skeletal remains of domesticated cats have been identified on the property. Zooarchaeological and taphonomic analysis was undertaken on the small faunal remains and domesticated cat remains. Limited evidence suggests that domesticated cats may have been used by humans as animal technologies, to curb the spread of disease and vectors. Animal technologies are defined as animals being used to serve a functional purpose or given a working role by humans; for example, domesticated cats as an alternative to rat poison. This poster explores the idea that the Schreiber family utilized domestic cats on their property in the late-19th and early-20th century to help control pests around their rural homes, perhaps, in part, to prevent the spread of animal-borne diseases amongst humans. The significance of domesticated cats used as animal technologies for pest control and subsequent disease prevention can help shape our understanding of human-animal relationships in southern Ontario in the late-19th and early-20th century.

How do we care for our human skeletal remains? Starting the collaborative conversation.

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This research presents findings from an initial survey examining the state of human skeletal remains collections housed within post-secondary institutions across British Columbia. As academic institutions increasingly grapple with ethical responsibilities regarding the use and policies governing human skeletal remains, and their accession procedures, understanding the scope and governance of these collections has become critically important. Our survey methodology involved a structured questionnaire distributed to all universities and colleges in BC. Data collection focused on institutional uses of skeletal remain in teaching, including course and level of instruction, and existing policies governing these collections, including at which institutional level the policy is set. Preliminary findings reveal significant variation in collection sizes and different approaches to the classroom use of the collections, as well as an interest in

collaborating to build robust cross-institution relationships and consistent approaches. This study provides the first systematic overview of human skeletal remains collections in BC's academic landscape, offering essential baseline data for policy development and highlighting opportunities for improved ethical stewardship and collaboration. The findings contribute to broader discussions about decolonizing teaching collections and academic practices while supporting institutions in developing more responsible approaches to human skeletal remains curation. It is our intention to extend this survey to other institutions across Canada

From adolescent stage to adolescent process

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“I feel like before I was a teenager, I started to become a teenager.” Adolescence is a uniquely human period key to the study of growth and development. In the North American imagination, the teenager occupies a distinct space between childhood and adulthood often defined by replicable biological and social markers. However, the age at which an individual experiences these transitions, and what developmental markers are most important to their own experiences of teenagerhood are deeply subjective. As part of a broader study on growth outcomes amongst young adults in the Greater Toronto Area, we conducted semi-structured interviews with 64 participants between the ages of 20 and 30 years. During the course of these interviews participants identify teenagerhood as a process, incorporating biological, social, and structural factors into their subjective definitions of adolescence. These factors include: beginning or ending puberty; starting middle school; starting high school; moving house/country; increased responsibility; adoption of care roles; exposure to taboo experiences; and their numerical age having the word teen in it. While there are myriad definitions of adolescence using either social or biological markers, and population level understandings of adolescence are important for grounding research, it is also crucial to be able step back from academic abstractions to view adolescence as an individual biocultural process informed not only by time and place, but also individual life experiences and perspectives. This presentation explores participant reflections on their subjective experiences of becoming adolescent, nuancing our understanding of adolescence from a distinct category to a biocultural process involving deeply entwined social and biological factors.

An interdisciplinary approach to residential school investigations: The contribution of archaeology

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Archaeology plays a vital role in multidisciplinary investigations of former Indian Residential School sites by offering tools, methods, and perspectives that support the respectful recovery of truth. Techniques such as remote sensing, excavation, archival analysis, and spatial modeling can help identify unmarked graves, reconstruct historical landscapes, and contextualize material evidence. These investigations are inherently complex and emotionally difficult, requiring careful navigation of cultural sensitivities, incomplete records, and the lasting impacts of colonial trauma. When combined with survivor testimony, archival records, and forensic analysis, archaeological insights contribute to a more comprehensive understanding of historical injustices and strengthen community-led efforts toward truth, justice, and healing.

Role of Ethiopian Orthodox Church Forests in sustaining primates in a changing world

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Worldwide, sacred forests serve as vital refuges where cultural values and ecological functions intersect, offering critical biodiversity sanctuaries in human-dominated landscapes. In Ethiopia, the Orthodox Tewahedo Church has safeguarded forest fragments for centuries, creating islands of green that preserve both ecological integrity and spiritual traditions in the intensively cultivated highlands. While these church forests are well known for their botanical and cultural significance, their role in sustaining primate populations under accelerating human and climatic pressures has received little attention. To better understand whether and how Ethiopian church forests support primate populations, we administered individual interviews and focus group discussions in northwestern Ethiopia. We assessed the scale and nature of primate–human interactions and investigated the governance systems that preserve church forests. Preliminary findings reveal that church forests provide essential habitats for primates, including crop raiding species, as surrounding protected areas diminish. Cultural and religious prohibitions often discourage killing, even during periods of severe crop loss, although some trapping was reported when damage became critical. Clergy governance and community norms continue to reinforce forest protection, but sustainability is increasingly threatened by declining youth engagement and illegal wood extraction. Overall, these findings indicate that church forests and their governance systems play a vital role in sustaining primates while enhancing community resilience in a rapidly changing environment.

Together in death: A re-evaluation of relationships between the deceased in double burials

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Double burials have long been viewed as representative of close, often familial or biological relationships. The aim of this work was to examine the ways in which these burials are approached by determining whether aDNA analysis is confirming initial assumptions regarding the relationships between deceased persons buried together. This dissertation examined 35 case studies consisting of simultaneously co-buried individuals from a variety of geographic and temporal origins. This study reviewed the common osteoarchaeological and funerary archaeological methods involved in the initial examination of said double burials. Direct comparisons were then made between the initial conclusions and the results of subsequent genetic testing in each case. Overall results revealed that initial relational assumptions are often inaccurate, and consequently show that, in relation to double burials, genetic kinship is not as significant a factor as previously thought. The limitations of bioarchaeological and funerary archaeological methods, as well as the enormous range of beliefs and practices, make necessary a multifaceted approach to these burials, alongside an understanding of the many case-specific nuances.