INSTITUTE OF ARCHAEOLOGY AND DEPARTMENT OF ANTHROPOLOGY

THEMES IN PALAEOANTHROPOLOGY AND PALAEOLITHIC ARCHAEOLOGY

Core Module for MSc in Palaeoanthropology and Palaeolithic Archaeology (30 credits): ARCL0123

MODULE HANDBOOK 2023-24

Olduvai Gorge, Tanzania – I. de la Torre

Coordinator: Matt Pope

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Office hours: please email to make an in-person or online appointment.

IMPORTANT INFORMATION REGARDING ASSESSMENTS:

The **coursework coversheet** is available on the course Moodle pages and here: https://www.ucl.ac.uk/archaeology/current-students under "Policies, Forms and Guidelines".

Please enter **your five-digit candidate code on the coversheet and *in the subject line*** when you upload your work in Moodle.

Please use **your five-digit candidate code as the name of the file** you submit.

For instructions on coursework submission, IoA referencing guidelines and marking criteria, as well as UCL policies on penalties for late submission, over-length work, the use of text generation software please refer to:

https://www.ucl.ac.uk/archaeology/current-students/ioa-student-handbook/13-information-assessment

https://www.ucl.ac.uk/archaeology/current-students/ioa-study-skills-guide/referencing-effectively-and-ioa-guidelines

https://www.ucl.ac.uk/students/exams-and-assessments/academic-integrity
https://library-guides.ucl.ac.uk/referencing-plagiarism/acknowledging-AI

1. MODULE OVERVIEW

Module description

This is the handbook for the core module of the MSc in Palaeoanthropology and Palaeolithic Archaeology, taught through Terms 1 and 2. It is a compulsory component of the degree programme, taught by UCL's leading specialists in the fields concerned.

Module Aims

This module provides a grounding on key subjects necessary for study and research in the fields of Palaeoanthropology and Palaeolithic Archaeology. It aims to provide post-graduate coverage of the following subject areas:

- History of approaches to palaeoanthropology and palaeolithic archaeology.
- Aspects of primate behaviour, adaptation and evolution.
- Recent hunter-gatherer lifeways and the use of ethnoarchaeology and experimental archaeology.
- Quaternary environmental history, faunal communities and palaeoecology.
- Approaches to taphonomy and site formation processes.
- The human fossil record and the evolution of human life history.
- The role of genetic evidence in studying human evolution.
- Stone artefact analysis
- Key case studies drawn from various time periods.

Learning Outcomes

On successful completion of this module, students will:

- Have a very strong foundation for graduate study in the fields of Palaeoanthropology and Palaeolithic archaeology.
- Be knowledgeable about the methodological and analytical approaches, and the theoretical models which have been used in reconstructing the human evolutionary past.
- Be able to review and critically appraise a wide range of primary and secondary sources and data relating to these fields.
- A detailed knowledge of human biological and cultural evolution.
- Expansion of written and oral skills in communicating complex ideas and data-sets derived from these academic disciplines.
- Ability to critically evaluate evidence and arguments regarding issues in human evolution.

Methods of Assessment

This module is assessed by means of two essays of 3,000 words each: one in the field of Palaeoanthropology and the other relating to Palaeolithic Archaeology. The deadlines for the essays will be:

- *Essay 1: Friday 9th January 2024*
- *Essay 2: Wednesday 9th April 2024*

Communications

- **The Course Moodle Page is the main hub** for this course.
- Important information will be posted by staff in the **Announcements section of the Moodle page** and you will automatically receive an email notification for these.
- Please post any general queries relating to module content, assessments and administration **in the MS Teams Module forum** (The forum will be checked regularly.

For personal queries, please contact the co-ordinator by email.

Contributing Lecturers

Aida Andres (UCL Genetics) Nick Ashton (British Museum) Silvia Bello (Natural History Museum) Dorian Fuller (UCL IoA Archaeology) Garrett Hellenthal (UCL Genetics) Philip Hopley (Birkbeck College) Sandra Martelli (UCL Biosciences) Aida Gomez-Robles (UCL Anthropology)	Claire Lucas (British Museum) Louise Martin (UCL IoA Archaeology) Matt Pope (UCL IoA Archaeology) Ceri Shipton (UCL IoA Archaeology) Christophe Soligo (UCL IoA Anthropology) Rhiannon Stevens (UCL IoA Archaeology) Mark Thomas (UCL Genetics)

Week-by-week summary

Week	Date		Subject	Lead
1	2	Oct	History of Palaeolithic Archaeology & Palaeoanthropology	Matt Pope
2	9	Oct	Site Formation	Matt Pope
3	16	Oct	Survey and Excavation	Matt Pope
4	23	Oct	Human Fossil Record	Aida Gomez-Robles
5	30	Oct	Human Fossil Record	Aida Gomez-Robles
6	6	Nov	**Reading Week**	
7	13	Nov	Plio-Pleistocene Environments	Phil Hopley
8	20	Nov	Late Pleistocene Europe	Matt Pope
9	27	Nov	Stone tool Analysis	Ceri Shipton
10	4	Dec	Stone Tools and Cognition'	Ceri Shipton
11	11	Dec	Anatomy Human Speech	Sandra Martello
			Christmas Break	
12	8	Jan	Primate Evolution	Christophe Soligo
13	15	Jan	Adaptation Phylogeny	Christophe Soligo
14	22	Jan	Faunal Analysis	Louise Martin
15	29	Jan	Stable Isotopes	Rhiannon Stevens
16	5	Feb	Archaeobotany	Dorian Fuller
17	12	Feb	**Reading Week**	
18	19	Feb	Genetics	Mark Thomas
19	26	Feb	Genetics	Garrett Hellenthal & Aida Andres
20	4	Mar	Genetics	Aida Andres & Mark Thomas &
21	11	Mar	Human Behaviour	Silvia Bello
22	18	Mar	Artefact Study	Nick Ashton Claire Lucas

Class Structure

The module is taught through lectures followed by discussions in a weekly two-hour class. Students will be required to undertake set readings, complete pre-class activities and make contributions to the discussions.

Workload

This is a 30-credit module which equates to 300 hours of learning time including session preparation, background reading, and researching and writing your assignments. With that in mind you should expect to organise your time in roughly this way:

40 hours	*Staff-led teaching sessions (lectures, seminars, tutorials, etc.)*
160 hours	*Self-guided session preparation (reading, listening, note-taking and online activities), about 6 hours a week*
50 hours	*Essay 1*
50 hours	*Essay 2*

Feedback

In trying to make this module as effective as possible, we welcome feedback from students. You will be asked to give your views on the module in an anonymous questionnaire which will be circulated at the end of the course. If students are concerned about any aspect of this module we hope they will feel able to talk to the Module Coordinator, but if they feel this is not appropriate, they should contact the Academic Administrator (Judy Medrington), or the Chair of Teaching Committee (Rachel King)

2. METHODS OF ASSESSMENT

The module will be assessed by **two essays of 3,000 words each**, one of which should be on a 'Palaeoanthropological' topic (see Group A essays at the end of this handbook) and one on a 'Palaeolithic Archaeological' topic (see Group B essays at the end of this handbook).

You can choose which order your write these in. It is very important to select essay topics which do not overlap closely with those being written for other modules being undertaken as part of the degree. If you are uncertain, please check with the Module Coordinator.

The coordinator will be willing to discuss an outline of the student's approach to the assignment, provided this is planned suitably in advance of the submission date.

. The deadlines for the essays will be:

- **Essay 1: Friday 9th January 2024**
- **Essay 2: Wednesday 9th April 2024**

COURSEWORK

Detailed guidance on the production, submission and assessment of coursework can be found in Chapter 13 of the Institute of Archaeology Student Handbook and the Institute of Archaeology Study Skills Guide. Please note that there are **penalties for late and over-length coursework, and for academic misconduct including plagiarism**. In some circumstances these penalties can be severely detrimental to your degree result, so **if in doubt or difficulty always seek guidance from a relevant member of staff**, such as the Course Coordinator, Degree Coordinator, Master's Tutor or Institute of Archaeology Academic Administrator.

Use of AI Applications and Software

The use of AI to generate written content is not allowed for production of the essay assessments on this course and will be penalised. However, the use of software for language and writing review and improvement is permitted, but the software and the way it has been used must be indicated in the relevant boxes on the coursework coversheet. UCL defines language and writing review as checking "areas of academic writing such as structure, fluency, presentation, grammar, spelling, punctuation, and language translation". Should you be unsure about your use of AI, or wish to use AI in a way not covered by this statement, please speak to one of the tutors.

LIBRARIES AND OTHER RESOURCES

To help you research for the essays essential reading for this course is available online through UCL's e-library. However, further reading not available online will be found in the library of the Institute of Archaeology and UCL's Science Library (particularly the Anthropology Section). Libraries outside of UCL which have relevant holdings include those at the University of London at Senate House and the British Library.

Coursework will be marked and returned within four weeks of the official submission deadline.

3. CLASS DETAILS

TERM 1

Week 1. History of Palaeoanthropology and Palaeolithic Archaeology. Matt Pope

This introductory session will examine the fascinating history of evolutionary thought concerning the origins of humans from the first provocative critiques of the biblical narrative in the mid 19th century through until the present day. We will divide this seminar into two: firstly looking at the discovery and changing interpretation of ancestral hominin fossils based on their morphology and more recently ancient DNA; and secondly the interpretation of developments in human behaviour from the material record left by their activities as well as their physical remains. In general, explanations that integrate many aspects of human anatomy and behaviour into single transformations have broken down, so that human evolution is now interpreted as a mosaic pattern.

Bowler P.J. 1986. *Theories of Human Evolution: A Century of Debate, 1844-1944*. Baltimore, Johns Hopkins University Press. (Anthrop: B 30 BOW; History of Science: RG 5 BOW)

De Groote I. et al. 2016. New genetic and morphological evidence suggests a single hoaxer created Piltdown Man. *Royal Society Open Science* 3: 160328. (Online)

Delisle R. 2006. *Debating Humankind's Place in Nature: The Nature of Paleoanthropology: 1860-2000.* New York, Prentice Hall. (Arch: BB 1 DEL; Issue Desk DEL 4)

Dennell R.W. 2001. From Sangiran to Olduvai, 1937-1960: The quest for 'centres' of hominid origins in Asia and Africa. In R. Corbey & W. Roebroeks (ed.): *Studying human origins: Disciplinary history and epistemology*. Amsterdam: Amsterdam University Press, 45-66. (Arch: BB1 Qto COR)

Grayson D.K. 1983. *The Estabishment of Human Antiquity*. New York, Academic Press. (Arch: AG GRA; or order from Library Stores)

Henke W. 2007. Historical Overview of Paleoanthropological Research. In W. Henke & I. Tattersall, (eds.) *Handbook of Paleoanthropology*. Berlin: Springer-Verlag, 1-56. (Online book – see library catalogue)

Lewin R. 1987. *Bones of Contention*. University of Chicago Press, Chicago. (Arch: BB 1 LEW)

Reader J. 1981. *Missing Links: The hunt for the earliest Man*. London, Penguin. (Arch: BB 1 REA)

Sackett J.R. 2000. Human antiquity and the Old Stone Age: the nineteenth century background to palaeoanthropology. *Evolutionary Anthropology* 9: 37-49. (Online)

Schroeder L. 2020. Revolutionary fossils, ancient biomolecules, and reflections in ethics and decolonization: Paleoanthropology in 2019. *American Anthropologist* 122(2): 306-320. (Online)

Schwartz J.H. (ed). (2018). *Rethinking Human Evolution*. London, The MIT Press. (On order for library)

Tattersall I. 2000. Paleoanthropology: the last half century. *Evolutionary Anthropology* 9: 2-36. (Online)

Trinkaus E. & Shipman P. 1993. *The Neandertals. Changing the Image of Mankind*. London, Jonathan Cape. (Arch: Issue Desk TRI; Anthrop: B 34 TRI)

Walker A. & Shipman P. 1996. *The Wisdom of Bones*. Weidenfeld & Nicolson, London. (Arch: BB 1 WAL).

Week 2. Site Formation Studies in Palaeolithic Archaeology– Matt Pope

Palaeolithic archaeology is preserved as part of the recent geological record and can be found in a variety of different sediment types. These include lake sediment, ancient soil horizons, river deposits, intertidal silts, cave sediments and slope deposits. Understanding the sedimentary context of a site is the first step in being able to reconstruct the processes that lie behind the formation of the record. In the lecture we look at examples from a variety of different contexts to explore how archaeologists work with Quaternary sediment specialists to understand the formation of the record. We'll be looking at concepts such as:

- Spatial Resolution: The degree to which a site preserves the traces of past human behaviour in three dimensions.
- Time Averaging: The degree to which an archaeological record relates to periods of time, from the moment to the palimpsest.
- Post-Depositional Modification: How can you identify movement or sorting of material by sedimentary processes.
- Preservational Bias: How, at different spatial scales, can we know what we are missing?
- *In Situ* Archaeology: Does it exist? What is its value?
- The Archaeological Site: What does it mean in the Palaeolithic?

- Been, E., Hovers, E., Ekshtain, R., Malinski-Buller, A., Agha, N., Barash, A., Mayer, D., Benazzi, S., Hublin, J.J., Levin, L. and Greenbaum, N., 2017. The first Neanderthal remains from an open-air Middle Palaeolithic site in the Levant. *Scientific reports*, *7*(1), p.2958. (Online)
- Benito-Calvo A. & Torre I. de la 2011. Analysis of orientation patterns in Olduvai Bed I assemblages using GIS techniques: Implications for site formation processes. *Journal of Human Evolution* 61, 50-60. (Online)

Goldberg P. & Macphail R. 2006. *Practical and theoretical geoarchaeology.* (Chapter 6 on "Aeolian settings and geomorphological environments" and Chapter 8 on "Caves and Rockshelters") Malden MA, Blackwell Science: 169-187. (Arch: BA 10 GOL; Issue Desk GOL2)

- Hovers, E., Ekshtain, R., Greenbaum, N., Malinsky-Buller, A., Nir, N., Yeshurun, R., 2014. Islands in a stream? Reconstructing site formation processes in the late Middle Paleolithic site of 'Ein Qashish, northern Israel. *Quaternary International* 331: 216-233. (Online)

Isaac G.L. 1983. Bones in contention: competing explanations for the juxtaposition of Early Pleistocene artefacts and faunal remains. Reprinted in B. Isaac (ed.) *The Archaeology of Human Origins.* Cambridge, Cambridge University Press: 325-335. (Arch: BB 1 ISA, Issue Desk ISA1)

- Malinsky-Buller, A., Hovers, E., Marder, O., 2011. Making time: 'Living floors', 'palimpsests' and site formation processes – A perspective from the open-air Lower Paleolithic site of Revadim Quarry, Israel. *Journal of Anthropological Archaeology* 30: 89-101. (Online)
- Sánchez-Romero, L., Benito-Calvo, A., Pérez-González, A. and Santonja, M., 2016. Assessment of accumulation processes at the middle Pleistocene site of Ambrona (Soria, Spain). Density and orientation patterns in spatial datasets derived from excavations conducted from the 1960s to the present. *PloS one*, 11(12), e0167595. (Online)

Stern N. 1993. The Structure of the Lower Pleistocene Archaeological Record. *Current Anthropology* 34, 201-225. (Online)

Schick, K., 1992. Geoarchaeological analysis of an Acheulean site at Kalambo Falls, Zambia. *Geoarchaeology*, *7*(1), pp.1-26. (Online)

Schick, K.D., 1986. *Stone Age sites in the making: experiments in the formation and transformation of archaeological occurrences*. Oxford, British Archaeological Reports 319. (Arch: AH Qto SCH)

Week 3. Survey and Excavation Methodology in Palaeolithic Archaeology – Matt Pope

How do we find sites preserving the human evolutionary record? What approaches are available to use and shown to be successful in surveying or evaluating landscape to locate are of potential and test them? In this lecture we'll move ion from considering the complexity of the early prehistoric archaeological record towards remote and field based techniques for finding it. Consideration will be given to how to avoid sampling biases and how to develop effective staged approaches in both research-led and developer funded contexts.

In part two, the methodologies available for recording and sampling archaeological sites in open air and karstic contexts will be presented and discussed.

Banning, E.B., 2021. Sampled to death? The rise and fall of probability sampling in archaeology. American Antiquity, 86(1), pp.43-60.

Bates, M. and Pope, M., 2016. Methods for reconstructing Ice Age landscapes. Lost landscapes of Palaeolithic Britain. English Heritage.

Isaac, G.L., 1981. Stone Age visiting cards: approaches to the study of early land use patterns. *Pattern of the past: studies in honour of David Clarke*, pp.131-155.

Rick, T.C., Alsharekh, A.M., Braje, T.J., Crowther, A., Erlandson, J.M., Fuller, D.Q., Gill, K.M., Groucutt, H.S., Guagnin, M., Helm, R. and Hofman, C.A., 2022. Coring, profiling, and trenching: Archaeological field strategies for investigating the Pleistocene-Holocene-Anthropocene continuum. Quaternary International, 628, pp.1-17.

Week 4. Human Fossil Record I: Stem hominins, Australopiths and early *Homo* – Aida Gomez-Robles

In this lecture we will explore the origins of bipedalism and its related anatomical adaptations. We will also look at some of the species that have been put forward as the first hominins and the controversies regarding their possible hominin classification. We will review the first undisputed hominins, *Australopithecus*, and we will also introduce *Paranthropus*, a lineage of very robust hominins that went extinct despite highly specialized dietary adaptations. We will cover the origin of the genus *Homo* and the earliest species within our own genus.

Harcourt-Smith, W.E.H. (2015) 'Origin of Bipedal Locomotion', in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 1919–1959.

Wood, B. and Harrison, T. (2011) 'The evolutionary context of the first hominins', *Nature*, 470(7334), pp. 347–352.

Senut, B. (2015) 'The Miocene Hominoids and the Earliest Putative Hominids Hominids', in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2043–2069.

White, T.D. *et al.* (2015) 'Neither chimpanzee nor human, *Ardipithecus* reveals the surprising ancestry of both', *Proceedings of the National Academy of Sciences*, 112(16), pp. 4877–4884.

Kimbel, W.H. and Villmoare, B. (2016) 'From *Australopithecus* to *Homo*: the transition that wasn't', *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1698).

Haile-Selassie, Y., Melillo, S.M. and Su, D.F. (2016) 'The Pliocene hominin diversity conundrum: Do more fossils mean less clarity?', *Proceedings of the National Academy of Sciences*, 113(23), pp. 6364–6371.

Collard, M. and Wood, B. (2015) 'Defining the Genus *Homo*', in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2107–2144.

Schrenk, F., Kullmer, O. and Bromage, T. (2015) 'The Earliest Putative Homo Fossils', in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2145–2165.

Week 5. The Human Fossil Record II: Later Members of Genus *Homo*) – Aida Gomez-Robles

This lecture will introduce the later members of *Homo,* from *Homo erectus* up to *Homo sapiens*. We will review the reasons that *Homo heidelbergensis* are such a problematic taxon, before examining the differences, both anatomical and behavioural, between our own species and our contemporaries, *Homo neanderthalensis*. We will go over the various models that have been used to explain the origin and dispersal of *Homo sapiens*, and get briefly review the ongoing research into interbreeding in late *Homo*. Finally, we will explore the more distant relatives with whom we once coexisted, *Homo floresiensis*, *Homo luzonensis* and *Homo naledi*, and the enigmatic Denisovans.

Antón, S.C., Potts, R. and Aiello, L.C. (2014) 'Evolution of early *Homo*: An integrated biological perspective', *Science*, 345(6192).

Baab, K.L. (2015) 'Defining *Homo erectus'*, in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2189–2219.

Rightmire, G.P. (2015) 'Later Middle Pleistocene *Homo'*, in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2221–2242.

Harvati, K. (2015) 'Neanderthals and Their Contemporaries', in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2243–2279.

Harvati, K. and Ackermann, R.R. (2022) 'Merging morphological and genetic evidence to assess hybridization in Western Eurasian late Pleistocene hominins', *Nature Ecology & Evolution* 6, pp. 1573–1585

Gómez-Robles, A. (2019) 'Dental evolutionary rates and its implications for the Neanderthal–modern human divergence', *Science Advances*, 5(5), eaaw1268.

Galway-Witham, J. and Stringer, C. (2018) 'How did *Homo sapiens* evolve?', *Science 360*, pp. 1296–1298.

Bergström, A. *et al.* (2021) 'Origins of modern human ancestry', *Nature*, 590(7845), pp. 229–237.

Bermúdez de Castro, J.M. and Martinón-Torres, M. (2022) 'The origin of the *Homo sapiens* lineage: When and where?', *Quaternary International* 634, pp. 1–13.

Peyrégne, S., Slon, V. and Kelso, J. (2023) 'More than a decade of genetic research on the Denisovans', *Nature Reviews Genetics* [Preprint]. Available at: https://doi.org/10.1038/s41576-023-00643-4.

Aiello, L.C. (2015) '*Homo floresiensis'*, in W. Henke and I. Tattersall (eds) *Handbook of Paleoanthropology*. Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 2281–2297.

Détroit, F. *et al.* (2019) ‘A new species of *Homo* from the Late Pleistocene of the Philippines’, *Nature*, 568(7751), pp. 181–186.

Week 7. Plio-Pleistocene environments– Phil Hopley

The climatic and ecological context of human evolution is crucial to the understanding of hominin adaptations and the speciation and extinction of early hominins. This seminar will outline trends in global and African climate in the Plio-Pleistocene and will discuss the geological and palaeontological evidence used to reconstruct hominin environments. We will discuss different hypotheses relating to the micro- and macro-evolutionary responses of hominins and other species to Plio-Pleistocene climatic change. Hominin ecomorphology will be discussed within the context of changing environments.

Behrensmeyer A.K. 2006. Climate Change and Human Evolution. *Science* 311 (5760): 476-478. (Online)

Behrensmeyer A.K., Todd N.E., Potts R. & McBrinn G.E. 1997. Late Pliocene faunal turnover in the Turkana Basin, Kenya. *Science* 278: 1589-1594. (Online)

Cohen, A. S. et al. (2022). Plio-Pleistocene environmental variability in Africa and its implications for mammalian evolution. *Proceedings of the National Academy of Sciences* 119 (16), e2107393119.

Kingston J. 2007. Shifting adaptive landscapes: Progress and challenges in reconstructing early hominid environments. *Yearbook of Physical Anthropology* 134 (S45): 20-58. (Online)

Maxwell, S. J. et al. (2018). Sporadic sampling, not climatic forcing, drives observed early hominin diversity. *Proceedings of the National Academy of Sciences* **115**(19): 4891-4896. (Online)

Potts R. 1996. Evolution and climate variability. *Science* 273: 922-923. (Online)

Sponheimer M., Passey B., de Ruiter J., Guatelli-Steinberg D., Cerling T., & Lee-Thorp J. 2006. Isotopic Evidence for Dietary Variability in the Early Hominin Paranthropus robustus. *Science* 314 (5801): 980-982. (Online)

Zachos J., Pagani M., Sloan L., Thomas E., & Billups K. 2001. Trends, Rhythms, and Aberrations in Global Climate 65 Ma to Present. *Science* 292 (5517): 686-693 (Online)

Week 8. Late Pleistocene Europe: Chronology, Environment and People

Late Pleistocene Europe (c.115-11.7ka) is characterised by significant climatic and environmental variability, including the expansion and contraction of continental ice sheets and associated shifts in ecosystem dynamics. Against this backdrop we see significant changes in the archaeological record, most notably the extinction of Neanderthals, the range expansion of anatomically modern humans, and an increase in diversity of cultural and technological artefacts. Using Late Pleistocene Europe as a case study, this seminar will look how we can integrate chronological, environmental and archaeological data to further our understanding of the Palaeolithic.

Binney H., Edwards M., Macias-Fauria M. et al. 2017. Vegetation of Eurasia from the last glacial maximum to present: Key biogeographic patterns. *Quaternary Science Reviews* 157: 80-97. (Online)

Blockley S. P. E., Blockley S. M., Donahue R. E. et al. 2006. The chronology of abrupt climate change and Late Upper Palaeolithic human adaptation in Europe. *Journal of Quaternary Science* 21: 575–584. (Online)

Burke A., Kageyama M., Latombe G. et al., 2017. Risky business: The impact of climate and climate variability on human population dynamics in Western Europe during the Last Glacial Maximum. *Quaternary Science Reviews* 164: 217-229. (Online)

Elias S. and Mock C. (2013) *Encyclopedia of Quaternary Science*. London: Elsevier. (Online)

Higham T.G.H., Douka K., Wood R. et al. 2014. The timing and spatiotemporal patterning of Neanderthal disappearance. *Nature* 512: 306-309. (Online)

Lowe J.J. and Walker M.J.C. (2015) *Reconstructing Quaternary Environments*. London: Routledge. (Online)

Rasmussen S.O., Bigler M., Blockley S.P. et al. 2014. A stratigraphic framework for abrupt climatic changes during the Last Glacial period based on three synchronized Greenland ice-core records: refining and extending the INTIMATE event stratigraphy. *Quaternary Science Reviews* 106: 14-28. (Online)

Staubwasser M., Dragusin V., Onac B.P. et al. 2018. Impact of climate change on the transition of Neanderthals to modern humans in Europe. *Proceedings National Academy Sciences U.S.A*. 115, 9116-9121. (Online)

Week 9. Stone Tool Technology– Ceri Shipton

Stone artefacts provide the most ubiquitous, longest, and continuous record of hominin behaviour, stretching over millions of years. They are difficult to make and therefore allow for comparisons of complex behaviours of different hominin species. This session will explore the evolution of lithic technology through the Palaeolithic from the Lomekwian, purported to be 3.3 million years old, to the Upper Palaeolithic in the last 50 thousand years. We will consider the major transitions in stone tool technology and what they might mean for hominin behaviour more generally.

Diez-Martín, F., Wynn, T., Sánchez-Yustos, P., Duque, J., Fraile, C., de Francisco, S., Uribelarrea, D., Mabulla, A., Baquedano, E. and Domínguez-Rodrigo, M., 2019. A faltering origin for the Acheulean? Technological and cognitive implications from FLK West (Olduvai Gorge, Tanzania). *Quaternary International*, *526*, pp.49-66. (Online)

Goring-Morris, A.N. and Belfer-Cohen, A., 2020. Noisy beginnings: the initial upper palaeolithic in southwest Asia. *Quaternary International*, *551*, pp.40-46. (Online)

Harmand S., Lewis J.E., Feibel C.S., Lepre C.J., Prat S., Lenoble A., Boës X., Quinn R.L., Brenet M., Arroyo A. and Taylor N., 2015. 3.3-million-year-old stone tools from Lomekwi 3, West Turkana, Kenya. *Nature* 521:310-315. (Online)

Hallinan, E. and Parkington, J., 2017. Stone Age landscape use in the Olifants River Valley, Clanwilliam, Western Cape, South Africa. *Azania: Archaeological Research in Africa*, *52*(3), pp.324-372. (Online)

Stout D., Semaw S., Rogers M.J. and Cauche, D., 2010. Technological variation in the earliest Oldowan from Gona, Afar, Ethiopia. *Journal of Human Evolution* 58: 474-491. (Online)

Shipton, C., 2022. Predetermined Refinement: the Earliest Levallois of the Kapthurin Formation. *Journal of Paleolithic Archaeology*, *5*(1), pp.1-29. (Online)

Shunkov, M.V., Kozlikin, M.B. and Derevianko, A.P., 2020. Dynamics of the Altai Paleolithic industries in the archaeological record of Denisova Cave. *Quaternary International*, *559*, pp.34-46. (Online)

Toth, N. and Schick, K., 2019. Why did the Acheulean happen? Experimental studies into the manufacture and function of Acheulean artifacts. *L'Anthropologie*, *123*(4-5), pp.724-768. (Online)

Week 10. Stone Tools and Cognition'. Ceri Shipton

Evolutionary approaches to human cognition can draw on fossil evidence (eg. endocasts) and on comparative data from living primates. Archaeologists recover a more extensive record of behaviour in surviving material culture, albeit sampling only a limited range of the full range of behavioural adaptations that would have characterized hominin life. In this lecture we will focus on cognitive archaeology, and consider the strategies of inference that enable reconstruction of the cognitive abilities of earlier hominins.

Muller, A., Clarkson, C. and Shipton, C., 2017. Measuring behavioural and cognitive complexity in lithic technology throughout human evolution. Journal of Anthropological Archaeology, 48, pp.166-180.

Schlanger, N., 1996. Understanding Levallois: lithic technology and cognitive archaeology. Cambridge Archaeological Journal, 6, pp.231-254.

Stout, D. and Chaminade, T., 2012. Stone tools, language and the brain in human evolution. Philosophical Transactions of the Royal Society B: Biological Sciences, 367(1585), pp.75-87.

Week 11. The Anatomy and Evolution of Modern Human Speech – Sandra Martelli

One of the defining modern human characteristics is the extensive use of speech, using acoustic signalling and language to communicate with others (both humans and non-humans). Speech is also an important tool to internally organise thought processes. Speech is a highly complex system, including amongst other things speech production and speech recognition which both have substantial impact on morphology and configurations and organisation of the brain. The evolutionary origins of speech are not resolved, as there is no equivalent model observed in living animals. Furthermore, complex systems like speech are difficult to track in the fossil record, all of which invites much debate and speculation. This session will introduce students to the anatomical requirements for speech production and provide a rough sketch of neurolinguistic requirements for speech and speech acquisition. The session will also introduce students to the limitations of what the hominoid fossil record can reveal about the evolution of modern human speech

Ackermann, H. 2008. Cerebellar contributions to speech production and speech perception: psycholinguistic and neurobiological perspectives. *Trends in Neurosciences,* 31**,** 265-272. (Online)

Barney, A., Martelli, S., Serrurier, A. & Steele, J. 2012. Articulatory capacity of Neanderthals, a very recent and human-like fossil hominin. *Philosophical Transactions of the Royal Society B-Biological Sciences,* 367**,** 88-102. (Online)

Blasi, D. E. Moran, S., Moisik, S. R., Widmer, P., Dediu, D. & Bickel, B. 2019. Human sound systems are shaped by post-Neolithic changes in bite configuration. *Science,* 363, 1192-+ (Online)

Bowling, D.L., Dunn, J.C., Smaers, J.B., Garcia, M., Sato, A., Hantke, G., Handschuh, S., Dengg, S., Kerney, M., Kitchener, A.C., Gumpenberger, M., Fitch, W.T. 2020. Rapid evolution of the primate larynx?. PLOS BIOLOGY, 18(8): e3000764. (Online).

Brenowitz, E. A., Margoliash, D. & Nordeen, K. W. 1997. An introduction to birdsong and the avian song system. *Journal of Neurobiology,* 33**,** 495-500. (Online)

Falk, D. 1975. Comparative anatomy of the larynx in man and the chimpanzee: implications for language in Neanderthal. *American Journal of Physical Anthropology,* 43**,** 123-132. (Online)

Fant, G. 1960. *Acoustic Theory of Speech Production,* The Hague, Mouton & Co. (UCL SSEES Library: R.XXIII.5 FAN)

Fitch, W. T. 2000. The evolution of speech: a comparative review. *Trends in Cognitive Sciences,* 4**,** 258-267. (Online)

Fitch, W. T. 2012. Evolutionary Developmental Biology and Human Language Evolution: Constraints on Adaptation. *Evolutionary Biology,* 39**,** 613-637. (Online)

Fitch, W. T., De Boer, B., Mathur, N. & Ghazanfar, A. A. 2016. Monkey vocal tracts are speech-ready. *Science Advances,* 2. (Online)

Guenther, F. H. & Vladusich, T. 2012. A neural theory of speech acquisition and production. *Journal of Neurolinguistics,* 25**,** 408-422. (Online)

Han, Y., Jun, W., Fischman, D. A., Biller, H. F. & Sanders, I. 1999. Slow Tonic Muscle Fibers in the Thyroarytenoid Muscles of Human Vocal Folds; A Possible Specialization for Speech. *The Anatomical Record,* 256**,** 146-157. (Online)

Heim, J. L., Boe, L. J. & Abry, C. 2002. Neandertal vocal tract adequate for speech. New investigations, new prospects. *Comptes Rendus Palevol,* 1**,** 129-134. (Online)

Hiiemae, K. M. & Palmer, J. B. 2003. Tongue movements in feeding and speech. *Critical Reviews in Oral Biology & Medicine,* 14**,** 413-429. (Online)
Holden, C. 2004. The origin of speech. *Science,* 303**,** 1316-1319. (Online)
Honey, C. J., Thompson, C. R., Lerner, Y. & Hasson, U. 2012. Not Lost in Translation: Neural Responses Shared Across Languages. *Journal of Neuroscience,* 32**,** 15277-15283. (Online)
Houghton, P. 1993. Neandertal supralaryngeal vocal tract. *American Journal of Physical Anthropology,* 90**,** 139-146. (Online)
Ichim, I., Kieser, J. A. & Swain, M. 2007. Tongue contractions during speech may have led to the development of the bony geometry of the chin following the evolution of human language: a mechanobiological hypothesis for the development of the human chin. *Medical Hypotheses,* 69**,** 20-24. (Online)
Joly, O., Pallier, C., Ramus, F., Pressnitzer, D., Vanduffel, W. & Orban, G. A. 2012. Processing of vocalizations in humans and monkeys: A comparative fMRI study. *Neuroimage,* 62**,** 1376-1389. (Online)
Klatt, D. H., Lieberman, P. & Crelin, E. S. 1973. Speech production abilities of primates and human evolution. *Journal of the Acoustical Society of America,* 53**,** 309-10. (Online)
Kuhl, P. K. 2010. Brain Mechanisms in Early Language Acquisition. *Neuron,* 67**,** 713-727. (Online)
Lieberman, P., Crelin, E. S. & Klatt, D. H. 1972. Phonetic ability and related anatomy of the newborn and adult human, Neanderthal man, and the chimpanzee. *American Anthropologist,* 74**,** 287-307. (Online)
Lieberman, P., Klatt, D. H. & Crelin, E. S. 1971. Anatomical constraints on speech in chimpanzee, newborn *Homo sapiens* and Neanderthal man. *Journal of the Acoustical Society of America,* 50**,** 139-+ (Online).
Nishimura, T., Mikami, A., Suzuki, J. & Matsuzawa, T. 2006. Descent of the hyoid in chimpanzees: evolution of face flattening and speech. *Journal of Human Evolution,* 51**,** 244-254. (Online)
Perkins, W. H. & Kent, R. D. 1986. *Textbook of functional anatomy of speech, language, and hearing,* London, Philadelphia, Taylor & Francis. (UCL Medical Science: Qto JH160 PER)
Serrurier, A., Badin, P., Barney, A., Boe, L. J. & Savariaux, C. 2012. The tongue in speech and feeding: Comparative articulatory modelling. *Journal of Phonetics,* 40**,** 745-763. (Online)
Steele, J., Clegg, M. & Martelli, S. 2013. Comparative Morphology of the Hominin and African Ape Hyoid Bone, a Possible Marker of the Evolution of Speech. *Human Biology,* 85**,** 639-672. (Online)

TERM 2

Week 12. Primate Evolution and Behaviour – Christophe Soligo

Research on non-human primates forms an integral part of palaeoanthropological research due to the comparative insights non-human primates provide into human evolution. Tool use, hunting and the recent discovery and descriptions of local cultural traditions in a range of non-human primate species are some of the most obvious behaviours exhibited by extant primates with a direct relevance to human evolution. Similarly, the fossil record of non-human primates is of foremost importance in that it provides insights into the physical and temporal framework within which the earliest phases of human evolution took place. This session will give students an overview of the latest developments in the fields of palaeoprimatology and comparative primate behaviour. This session will give students an overview of the fields of palaeoprimatology and of primate comparative anatomy and behavior.

Campbell et al. (2011). *Primates in Perspective.* 2nd Edition. Oxford University Press. (Anthrop: B 24 CAM)

Cartmill M. 1990. Human uniqueness and theoretical content in paleoanthropology. International *Journal of Primatology* 11:173-192 (Online)

Fleagle J.G. 2013. *Primate Adaptation and Evolution*. 3rd ed. Academic Press, San Diego. (Online – Chapters available from library as separate downloads)

Hartwig C. (ed.) 2002. *The Primate Fossil Record*. Cambridge, Cambridge University Press. (Anthrop: B 40 HAR)

Martin R.D. 1990. *Primate Origins and Evolution*. Princeton University Press, Princeton. (Anthrop: B 34 MAR)

Reed K.E. & Bidner L.R. 2004. Primate communities: past, present, and possible future. *Yearbook of Physical Anthropology* 41: 2-39. (Online)

Soligo C. (ed.) 2007. Primate Evolution and Environments. *Folia Primatologica* 78: 273-448. (Online)

Soligo C & Smaers JB. 2016. Contextualising primate origins – an ecomorphological framework. *Journal of Anatomy* 228: 608–629. (Online)

Strier K. 2017. *Primate Behavioral Ecology* (5t* edn). Routledge, New York. (Anthrop: B 24 STR)

Whiten A. 2005. The second inheritance system of chimpanzees and humans. Nature 437: 52-55. (Online)

Week 13. . Adaptation, Phylogeny and Reconstruction of Behaviour – Christophe Soligo

The process of natural selection is central to understanding how the environment has shaped human evolution. It also provides the theoretical framework for using skeletal evidence to reconstruct behaviour of humans and other animals in the past. In this session we go through concepts of adaptation, how to test hypotheses of adaptation, and the challenges of then using evidence of adaptation to reconstruct behaviour.

Cartmill M. 1990. Human uniqueness and theoretical content in paleoanthropology. International *Journal of Primatology* 11:173-192 (Online)

Felsenstein J. 2003. *Inferring Phylogenies*. Sunderland (Mass.): Sinauer Assocs. (Biology J 9 FEL)

Goswami A, Smaers JB, Soligo C, Polly PD. 2014. The macroevolutionary consequences of phenotypic integration: From development to deep time. *Philosophical Transactions of the Royal Society of London, B: Biological Sciences* 369 (1649): 20130254. (Online)

Hall B.K. 2007. Homoplasy or homology: dichotomy or continuum? *Journal Human Evolution* 52: 473-479. (Online)

Nunn C.L. 2011. *The Comparative Approach in Evolutionary Anthropology and Biology*. University of Chicago Press, Chicago. (Anthrop: B 30 NUN)

Plavcan J.M., Kay R.F., Jungers W.L. & Van Schaik C.P. (eds) 2001. *Reconstructing Behavior in the Primate Fossil Record.* New York, Kluwer Academic/ Plenum Publishers: 1-41. (Arch: BB 3 PLA; Anthrop; B 44 PLA)

Rose M.R. & Lauder G.V. (eds.) 1996. *Adaptation*. San Diego, Academic Press. (Biology J 7 ROS)

Smith R.J. 2016. Explanations for adaptations, just-so stories, and limitations on evidence in evolutionary biology. *Evolutionary Anthropology* 25: 276-287. (Online)

Soligo C & Smaers J.B.. 2016. Contextualising primate origins – an ecomorphological framework. *Journal of Anatomy* 228: 608–629. (Online)

Week 14. Exploitation of Faunal Resources: Late Glacial Hunters of the Jordanian Steppe – Louise Martin

A key research focus in the Late Pleistocene of the Fertile Crescent area has been shifts in hunter-gatherer resource use and the impacts of climate changes in the late Glacial periods, which herald the arrival of agriculture in the early Holocene. This seminar side-steps the fertile zones of the Levant, focusing instead on the semi-arid steppes of Jordan, which has been a research area for several Institute of Archaeology researchers. Here, we will explore human-animal interaction (hunting methods, pressure on wildlife, and the organization of hunter-gatherer sites) through a series of zooarchaeological studies, and see how this area informs on broader debates about resource intensification in the Epipalaeolithic period.

Garrard A.N. and Byrd B.F. (2013) *Beyond the Fertile Crescent. Late Palaeolithic and Neolithic Communities of the Jordanian Steppe*. Oxford, Oxbow (Chapters 1, 9) (Online)

Henton, E., Martin, L., Garrard, A., Jourdan, A.L., Thirlwall, M. and Boles, O., 2017. Gazelle seasonal mobility in the Jordanian steppe: the use of dental isotopes and microwear as environmental markers, applied to Epipalaeolithic Kharaneh IV. *Journal of Archaeological Science: Reports* 11: 147-158.(Online)

Maher, L.A., Richter, T., Macdonald, D., Jones, M.D., Martin, L. and Stock, J.T., 2012. Twenty thousand-year-old huts at a hunter-gatherer settlement in eastern Jordan. *PloS ONE 7* (2), p.e31447. (Online)

Maher L.A., Richter T. & Stock J.T. (2012) The Pre-Natufian Epipaleolithic: Long-term behavioural trends in the Levant. *Evolutionary Anthropology* 21: 69-81. (Online)

Martin, L., Edwards, Y. and Garrard, A., 2013. Broad spectrum or specialised activity? Birds and tortoises at the Epipalaeolithic site of Wadi Jilat 22 in the eastern Jordan steppe. *Antiquity 87* (337): 649-665.(Online)

Martin, L., Edwards, Y.H., Roe, J. and Garrard, A., 2016. Faunal turnover in the Azraq Basin, eastern Jordan 28,000 to 9000 cal yr BP, signalling climate change and human impact. *Quaternary Research 86* (2): 200-219.(Online)

Munro, N., 2009. Epipaleolithic subsistence intensification in the southern Levant: the faunal evidence. In J-J. Hublin, M.P. Richards (eds.) *The Evolution of Hominin Diets*. Springer, Dordrecht: 141-155.

Richter, T., Maher, L.A., Garrard, A.N., Edinborough, K., Jones, M.D. and Stock, J.T., 2013. Epipalaeolithic settlement dynamics in southwest Asia: new radiocarbon evidence from the Azraq Basin. *Journal of Quaternary Science 28* (5): 467-479. (Online)

Spyrou, A., Maher, L.A., Martin, L.A., Macdonald, D.A. and Garrard, A., 2019. Meat outside the freezer: Drying, smoking, salting and sealing meat in fat at an Epipalaeolithic megasite in eastern Jordan. *Journal of Anthropological Archaeology* 54: 84-101.(Online)

Stutz, A.J., Munro, N.D. and Bar-Oz, G., 2009. Increasing the resolution of the Broad Spectrum Revolution in the Southern Levantine Epipaleolithic (19–12 ka). *Journal of Human Evolution 56* (3): 294-306.(Online)

Week 15. Application of Proteomics Studies to the Palaeolithic – Rhiannon Stevens

This lecture will introduce the application of isotopic analysis to Palaeolithic and Mesolithic archaeological studies. Isotope of carbon, nitrogen, oxygen and strontium will be introduced, along with the mechanisms by which they vary in the biosphere. We will look at how stable isotopes ratios are measured and the types of materials that can be sampled. A range of Palaeolithic and Mesolithic archaeological case studies will show how isotope analyses can aid the reconstruction of past diets, environments and mobility patterns.

Principles of stable isotopes in archaeology:

Ben-David, M., & Flaherty, E.A. 2012. Stable isotopes in mammalian research: a beginner's guide. *Journal of Mammalogy* 93 (2), 312–328. (Online)

Bentley A. 2006. Strontium isotopes from the earth to the archaeological skeleton: a review. *Journal of Archaeological Method and Theory* 13 (3):135-187 (Online)

Lee-Thorp J. 2008. On isotopes and old bones. *Archaeometry* 50: 925-950. (Online)

Montgomery, J. 2010. Passports from the past: Investigating human dispersals using strontium isotope analysis of tooth enamel. *Annals of Human Biology* 37 (3): 325-346. (Online)

Pollard A.M. & Wilson L. 2001. Global biogeochemical cycles and isotope systematics - how the world works. In D.R. Brothwell & A.M. Pollard (eds.) *Handbook of Archaeological Sciences*. Chichester: John Wiley. (Arch: AJ BRO)

Case Studies:

Britton, K.H., Grimes, V., Niven, L., Steele, T. E., McPherron, S., Soressi, M., et al. 2011. Strontium isotope evidence for migration in late Pleistocene Rangifer: Implications for Neanderthal hunting strategies at the Middle Palaeolithic site of Jonzac, France. *Journal of Human Evolution*, *61* (2), 176–185.(Online)

Copeland, S R., Sponheimer, M., de Ruiter, D.J., Lee-Thorp, J.A., Codron, D., le Roux, P.J., et al. 2011. Strontium isotope evidence for landscape use by early hominins. *Nature*, *474* (7349), 76–78. (Online)

Milner, N., Craig, O.E., Bailey, G.N. & Andersen, S.H. 2006. Touch not the fish: the Mesolithic-Neolithic change of diet and its significance - A response to Richards and Schulting. *Antiquity* 80: 456-458. (Online)

Richards, M.P. & Schulting, R, 2006. Touch not the fish: the Mesolithic-Neolithic change of diet and its significance. *Antiquity* 80: 444-456. (Online)

Richards, M.P., & Trinkaus, E. 2009. Out of Africa: modern human origins special feature: isotopic evidence for the diets of European Neanderthals and early modern humans. *Proceedings of the National Academy of Sciences* 106 (38), 16034–16039. (Online)

Schoeninger, M.J. 2014. Stable Isotope Analyses and the Evolution of Human Diets. *Annual Review of Anthropology*, *43* (1), 413–430. (Online)

Stevens, R.E., Jacobi, R., & Higham, T. 2010. Reassessing the diet of Upper Palaeolithic humans from Gough's Cave and Sun Hole, Cheddar Gorge, Somerset, UK. *Journal of Archaeological Science 37*, 52–61. (Online)

Stevens, R.E., Hermoso-Buxán, X.L., Marín-Arroyo, A.B., González Morales, M.R., & Straus, L.G. 2014. Investigation of Late Pleistocene and Early Holocene palaeoenvironmental change at El Mirón cave (Cantabria, Spain): Insights from carbon and nitrogen isotope analyses of red deer. *Palaeogeography, Palaeoclimatology, Palaeoecology 414*, 46–60. (Online)

Week 16. Archaeobotany of hunter-gatherer and hominin diets (30 Jan) - Dorian Fuller

The study of palaeolithic subsistence has often emphasized "Man the Hunter" in part because of limited empirical evidence of plant components of past diet. This has translated into popular notions, such as "Palaeo-diet" that emphasize meat and assume that starch-rich diets are a production of the advent of cultivation. Recent archaeobotanical recovery and theoretical development, however, has begun to call these assumption into question as archaeobotanical evidence has revealed Palaeolithic tuber use, starchy nut and small seed use. The mounting evidence for diversity in palaeolithic plant consumption may also challenge the concept of a "Broad Spectrum Revolution", which has often been seen as a development of the terminal Pleistocene that paved the way for cereal consumption and agriculture. This session will explore some theoretical evidence for early dietary diversity and starch consumption as well as a selection of archaeobotanical case studies from southern Africa, north Africa, China and Australia.

Key Readings

Larbey, C., Mentzer, S. M., Ligouis, B., Wurz, S., & Jones, M. K. (2019). Cooked starchy food in hearths ca. 120 kya and 65 kya (MIS 5e and MIS 4) from Klasies River Cave, South Africa. *Journal of Human Evolution*, *131*, 210-227. (Online)

Wadley, L., Backwell, L., d'Errico, F., & Sievers, C. (2020). Cooked starchy rhizomes in Africa 170 thousand years ago. *Science*, *367*(6473), 87-91. (Online)

Barton, R. N. E., Bouzouggar, A., Collcutt, S. N., Marco, Y. C., Clark-Balzan, L., Debenham, N. C., & Morales, J. (2016). Reconsidering the MSA to LSA transition at Taforalt Cave (Morocco) in the light of new multi-proxy dating evidence. *Quaternary International*, *413*, 36-49. (Online)

Florin, S.A., Fairbairn, A.S., Nango, M., Djandjomerr, D., Marwick, B., Fullagar, R., Smith, M., Wallis, L.A. and Clarkson, C., 2020. The first Australian plant foods at Madjedbebe, 65,000–53,000 years ago. *Nature Communications*, *11*(1), pp.1-8. (Online)

Guan, Y., Pearsall, D. M., Gao, X., Chen, F., Pei, S., & Zhou, Z. (2014). Plant use activities during the upper Paleolithic in east Eurasia: evidence from the Shuidonggou site, Northwest China. *Quaternary International*, *347*, 74-83. (Online)

Further readings

Champion, L. and Fuller, D. Q. (2019) Archaeobotany: Methods and Themes. In Mitchell, Peter (ed.) *The Oxford Encyclopedia of African Histories: Methods, Sources, and Historiographies.* Oxford: Oxford University Press. (Online) [For those less familiar with archaeobotanical methods and issues in general, this provide an overview geared towards field conditions in Sub-Saharan Africa. It also includes a section on "Hunter-gatherer plant use" based on various African assemblages. **PDF to be made available via moodle**.]

Hillman, G. C., & Wollstonecroft, M. M. (2014). Dietary diversity: our species-specific dietary adaptation. In: *Archaeology of African Plant Use* (eds. C. J. Stevens, S. Nixon, M. A. Murray and D. Q. Fuller).Walnut Creek: Left Coast Press/UCL Institute of Archaeology Publications. Pp. 37-49 **PDF to be made available via moodle.**

Roberts, P., & Stewart, B. A. (2018). Defining the 'generalist specialist'niche for Pleistocene Homo sapiens. *Nature Human Behaviour*, *2*(8), 542-550. (Online)

Jones, M. (2009). Moving north: archaeobotanical evidence for plant diet in Middle and Upper Paleolithic Europe. In *The Evolution of Hominin Diets* (pp. 171-180). Springer, Dordrecht. (Online)

Morales, J. (2018). The contribution of botanical macro-remains to the study of wild plant consumption during the Later Stone Age and the Neolithic of north-western Africa. *Journal of Archaeological Science: Reports*, 22, 401-412. (Online)

Dilkes-Hall, I. E., O'Connor, S., & Balme, J. (2019). People-plant interaction and economic botany over 47,000 years of occupation at Carpenter's Gap 1, south central Kimberley. *Australian Archaeology*, 85(1), 30-47(Online)

Week 18 . Genetics and Human Evolution I: Introduction – Mark Thomas

The study of molecular information revolutionised anthropology in the 1960s and 1970s, pointing to major conclusions such as the close relationships of humans to chimpanzees and the relatively high levels of genetic variation within human populations as opposed to between. In recent decades genetics has taken a central place in understanding modern human origins, and the study of ancient DNA may give us a complete Neanderthal genome within a matter of years. This session combines the history of understanding with current major topics in human evolutionary genetics.

Cavalli-Sforza L., Menozzi P. & Piazza A. 1994. *The History and Geography of Human Genes*. Princeton, NJ, Princeton University Press. (Arch: BB 1 CAV)

Fu, Q et al. 2014. Genome sequence of a 45,000-year-old modern human from western Siberia. *Nature* 514**:** 445-449. (Online)

Fu Q. et al. 2016. The genetic history of Ice Age Europe. *Nature* 534: 200-205. (Online)

Green R.E. 2010 A draft sequence of the Neandertal genome. *Science* 328 (5979): 710-722. (Online)

Jobling M.A., Hurles M.E. & Tyler-Smith C. 2004. *Human Evolutionary Genetics: Origins, Peoples and Disease.* London, Garland Science Publishing. (Arch: BB 1 JOB; Medical Science: BK 10 JOB)

Krings M. et al. 1997. Neanderthal DNA sequences and the origins of modern humans. *Cell* 90: 19-30. (Online)

Mendez, F. L. et al. 2013. An African American paternal lineage adds an extremely ancient root to the human Y chromosome phylogenetic tree. *American Journal of Human Genetics* 92**:** 454-9. (Online)

Reich D. 2018. *Who We Are and How We Got Here*. Oxford: Oxford University Press. (Arch: BB1 REI)

Meyer, M. et al. 2014. A mitochondrial genome sequence of a hominin from Sima de los Huesos *Nature* 505: 403-406. (Online)

Prufer, K. et al.2014. The complete genome sequence of a Neanderthal from the Altai Mountains *Nature* 505**:** 43-49. (Online)

Prugnolle, F., Manica, A. & Balloux, F. 2005. Geography predicts neutral genetic diversity of human populations *Current biology* 15 (5): R159-R160. (Online)

Sankararaman S, Patterson N, Li H, Pääbo S, Reich D 2012. The date of Interbreeding between Neandertals and Modern Humans. *PLoS Genetics* 8(10): e1002947. (Online)

Slon V. et al. 2018. The genome of the offspring of a Neanderthal mother and a Denisovan father. *Nature* 561: 113-116.

Week 19. Genetics and Human Evolution II: Demographic History – Garrett Hellenthal & Aida Andres

We describe popular techniques being applied to genome-wide genetic variation data in order to infer features of human demography. Topics covered include genetic distance measures, principal-components-analysis, clustering algorithms, correlated drift models and haplotype-based methods. We highlight the intuition behind some of the widely-used software in the field and address their limitations. We also discuss how these tools have informed our current understanding of the population histories of modern and archaic humans, as well as their interactions and intermixing.

Green R.E. et al 2010. A draft sequence of the Neandertal genome. *Science* 328(5979):710-722. doi: 10.1126/science.1188021. (Online)

Hellenthal G. 2019. Population Structure, Demography and Recent Admixture. In DJ Balding (ed) *Handbook of Statistical Genomics*, 4th edition (Chapter 8). (Online)

Jacobs G.S. et al. 2019. Multiple Deeply Divergent Denisovan Ancestries in Papuans. *Cell* 177(4):1010-1021.e32. doi: 10.1016/j.cell.2019.02.035. (Online)

Kuhlwilm M. et al. 2016. Ancient gene flow from early modern humans into Eastern Neanderthals. *Nature* 530(7591):429-33. doi: 10.1038/nature16544. (Online)

Li H, & Durbin R. 2011. Inference of human population history from individual whole-genome sequences. *Nature* 475: 493-496. (Online)

McVean et al 2009. A genealogical interpretation of principal components. *PLoS Genetics* 5:e1000686. (Online)

Meyer G. et al. 2012. A high-coverage genome sequence from an archaic Denisovan individual. *Science* 338(6104):222-6. doi: 10.1126/science.1224344. (Online)

Novembre J. et al 2008. Genes mirror geography within Europe. *Nature* 456:98-101. (Online)

Patterson N. et al 2012. Ancient admixture in human history. *Genetics* 192:1065-1093. (Online)

Pritchard J.K., Stephens M. and Donnelly P. 2000. Inference of population structure using multilocus genotype data. *Genetics* 155:945-959. (Online)

Rosenberg N.A. et al 2012. Genetic structure of human populations. *Science* 298: 2381-2385. (Online)

Sankararaman S. et al 2014. The genomic landscape of Neanderthal ancestry in present-day humans. *Nature* 507(7492):354-7. doi: 10.1038/nature12961. (Online)

Schraiber J.G. & Akey J.M. 2015. Methods and models for unravelling human evolutionary history. *Nature Review Genetics* 16(12):727-40. (Online)

Speidel L. et al 2019. A method for genome-wide genealogy estimation for thousands of samples. *Nature Genetics* 51:1321-1329. (Online)

Week 20. Genetics and Human Evolution III: Signatures of Selection – Aida Andres & Mark Thomas

We discuss how genetics can help us understand how humans have adapted to their environment. We will introduce several methods commonly used to identify the genes that have mediated adaptation of humans to their environments. We will talk about methods that can identify the genetic signatures of population-specific adaptation to local environments, which generate genetic differences among human populations, and methods that identify the signatures of older events of genetic adaptation, which differentiate modern humans from archaic humans and other primates. We will also discuss the advantages and limitations of genomic analyses, and present some of the clearest and most interesting cases of natural selection in humans.

Ilardo M, Nielsen R. 2018. Human adaptation to extreme environmental conditions. *Current Opinion in Genetics and Development* 53:77-82. doi: 10.1016/j.gde.2018.07.003. (Online)

Nielsen R. 2005. Molecular signatures of natural selection. *Annual Review of Genetics*. 39:197-218. (Online)

Scheinfeldt L.B., Tishkoff S.A. 2013. Recent human adaptation: genomic approaches, interpretation and insights. *Nature Review. Genetics*. 14: 692-702. doi: 10.1038/nrg3604. (Online)

Week 21. From the Natural History Museum: Human Behaviour under the microscope – Silvia Bello

Early humans modified and used bones, teeth and antlers in many ways, leaving traces that can be associated with butchery, the production of tools and the manufacture of artistic objects. Recent developments in imaging technologies provide new insights in bone taphonomy, furthering our understandings of ancient human behaviours. In this seminar, I will present case studies in which multiple techniques have been used to visualize and analyse the internal and external features of modified bone, teeth and antler. Examples from Prehistoric Europe will be described to highlight how microscopy has helped to (1) identify organic tools such as knapping tools; (2) suggest alternative interpretations of how organic tools such as Magdalenian perforated batons were used; and (3) to distinguish symbolic cannibalism from the defleshing of human bodies, not associated with the consumption of the cadaver.

Bello S.M. and Galway-Whitham J. 2019. Bone taphonomy inside and out: Application of 3-dimensional microscopy, scanning electron microscopy and micro-computed tomography to the study of humanly modified faunal assemblages. *Quaternary International* 517: 16-32. (Online)

Bello S.M., Blinkhorn E., Needham A., Bates M., Duffy S., Little A., Pope M., Scott B., Shaw A., Welch M.D., Kinnaird T., Millar L., Robinson R., and Conneller C. 2020. Artists on the edge of the world: An integrated approach to the study of Magdalenian engraved stone plaquettes from Jersey (Channel Islands). *Plos One* 15(8): e0236875. (Online)

Bello S.M., Wallduck R., Dimitrijević V., Živaljević I., Stringer C.B. 2016. Cannibalism versus funerary defleshing and disarticulation after a period of decay: comparisons of bone modifications from four prehistoric sites. *American Journal of Physical Anthropology* 161(4), 722-743. (Online)

Hutson J.M., García-Moreno A., Noack E.S., Turner E., Villaluenga A., Gaudzinski-Windheuser S. (eds) 2018. *The Origins of Bone Tool Technologies*. RGZM – TAGUNGEN, Band 35
This collection of papers can be download free here:
https://www.academia.edu/37356967/The_Origins_of_Bone_Tool_Technologies_Full_Text_edited_by_Jarod_M_Hutson_Alejandro_Garc%C3%ADa_Moreno_Elisabeth_S_Noack_Elaine_Turner_Aritza_Villaluenga_and_Sabine_Gaudzinski_Windheuser

Soressi M, McPherron SP, Lenoir M, Dogandžić T, Goldberg P, Jacobs Z, et al. 2013. Neandertals made the first specialized bone tools in Europe. *Proceedings National Academy of Sciences* 110(35): 14186-14190. (Online)

Week 22a. From the British Museum (Franks House): Current Research on Lower and Middle Palaeolithic in UK – Nick Ashton

Nick Ashton has been a curator at the British Museum for over 35 years, specializing in Lower and Middle Palaeolithic archaeology and helps curate the extensive stone tool collections from these periods. He has directed and published major excavation projects at the Lower Palaeolithic sites of High Lodge, Barnham, Elveden and Hoxne (all Suffolk) and Happisburgh (Norfolk). He was Deputy Director of the Ancient Human Occupation of Britain Project (AHOB) funded by the Leverhulme Trust and is currently co-Director of the Pathways to Ancient Britain project funded by the Calleva Foundation. These projects have been examining the presence and habitat preferences of early humans in north-west Europe over the last 800,000 years. His particular interests are: the earliest occupation of northern Europe; the early human adaptation to northern environments; and the effect of changes in climate and island/peninsula status of Britain on new populations entering from Europe.

Ashton N.M. 2016. The human occupation of Britain during the Hoxnian Interglacial. *Quaternary International* 409: 41-53. (Online)

Ashton N.M. 2017. *Early Humans*. London: Harper Collins. (Arch: DAA 100 ASH)

- Ashton N.M. & Lewis S.G. 2012. The environmental context of early human occupation of northwest Europe: The British Lower Palaeolithic Record. *Quaternary International* 271: 50-64. (Online)
- Ashton N.M. & Scott B. 2015. The British Middle Palaeolithic. *Quaternary International* 411: 62-76. (online)

Ashton N.M. et al. 2016. Handaxe and non-handaxe assemblages during Marine Isotope Stage 11 in northern Europe: recent investigations at Barnham, Suffolk UK. *Journal of Quaternary Science* 31 (8): 837-43.

Hosfield R. 2020*. The Earliest Europeans: a year in their life: seasonal survival strategies in the Lower Palaeolithic*. Oxford, Oxbow. (on order for the library)

Lewis S.G., et al. 2019. Human occupation of northern Europe in MIS 13: Happisburgh Site 1 (Norfolk, UK) and its European context. *Quaternary Science Reviews* 211: 34-58.

Parfitt S.A., Ashton N.M., et al. 2010. Early Pleistocene human occupation at the edge of the boreal zone in northwest Europe. *Nature* 466**:** 229–233. (Online)

Parfitt S.A. et al. 2005. The earliest record of human activity in northern Europe. *Nature* 438: 1008-12. (Online)

Pettitt P. & White M. 2012. *The British Palaeolithic. Human Societies at the Edge of the Pleistocene World*. London, Routledge. (Arch: DAA 120 PET)

Week 22b. From the British Museum (Franks House): Upper Palaeolithic portable "art" collection in the British Museum – Claire Lucas

This session will focus on Magdalenian portable art, showing original objects from the British Museum collections and commenting on the relationship between the objects and their 'decoration'. The raw material, dimensions, manufacture and use of engraved or sculpted objects will be put in perspective with the themes and composition of the representations to understand their place within Palaeolithic material culture.

Bahn P.G. & Vertut J. 2016. *Images of the Ice Age*. 3rd ed. Oxford, Oxford University Press. (Arch: BC 300 BAH)

Cook J. 2013. *Ice Age Art. The arrival of the modern mind*. London: British Museum Press (Arch: BC300 COO; Issue Desk)

Fuentes O., Lucas C. & Robert E. 2017. An approach to Palaeolithic networks the question of symbolic territories and their interpretation through Magdalenian art. *Quaternary International* 503. (Online)

Lucas C. et al. 2019. Investigating the use of Paleolithic perforated batons: new evidence from Gough's Cave (Somerset, UK). *Archaeological and Anthropological Sciences* 11 (2) (Online)

Sieveking A. 1987. *A catalogue of Palaeoltihic art in the British Museum*. Cambridge, British Museum Publications. (Arch: DA 120 SIE)

4. ESSAYS

GROUP A: PALAEOANTHROPOLOGY

A1. ***History of palaeoanthropology.***
Write a synthesis of the history of interpretation of human evolution, focusing on a specific time period of your choice (e.g. late C19 / early C20).
(N.B. If you choose this essay topic, you should not select essay B1 for your second assessment).

A2. ***Adaptation and primate evolution.***
Review and evaluate the methods for studying adaptation in the primate fossil record, focusing your discussion on the origins and diversification of any specific clade within primate evolution.

A3. ***Hominin dispersals.***
Discuss the biogeographic history of the hominin clade, focusing on possible reasons behind the major dispersal events.

A4. ***Neanderthals and Homo sapiens.***
Synthesise what we know of the evolution and biology of Neanderthals and Modern Humans, focusing on the possible causes for the apparent demise of Neanderthals and the success of modern humans.
(N.B. If you choose this essay topic, you should not select essay B4 for your second assessment).

A5. ***Hominin adaptations.***
Discuss the development and significance of the bipedal locomotor adaptation in human evolution.

ESSAYS – GROUP B: PALAEOLITHIC ARCHAEOLOGY

B1. Review the history of research and theoretical agendas relating to the study of the earliest paleoanthropological and archaeological sites from Africa OR Asia
(N.B. If you choose this essay topic, you should not select essay A1 for your second assessment).

B2. ***Evolution of diet.***
Review and critique the various lines of evidence for the evolution of hominin diet EITHER (a) prior to the emergence of Neanderthals or other contemporary hominin populations OR (b) in Neanderthals and early Modern Humans (prior to the end of the Pleistocene). Discuss the potential importance of plant versus animal foods and in the case of earlier hominins the impact of the development of cooking.

(continued over)

B3. ***Earliest technology.***
Is there such a thing as the Developed Oldowan distinct from the Initial Oldowan represented at sites like Gona in Ethiopia and Lokalalei in Tanzania? Following from whether you agree or

disagree with the reality of the Developed Oldowan, what are the wider implications for hominin behaviours in the period 2-1.5 million years ago?

B4. ***Neanderthals and Homo sapiens***
There has been a long-term debate about the nature of the Middle to Upper Palaeolithic Transition in Eurasia and the replacement of Neanderthals by *Homo sapiens*. Contrast the spatial-temporal distribution and behavioural record of the two populations through the transitional period and evaluate the models for possible interactions and final replacement of Neanderthals.

B5. ***Taphonomy and site formation processes.***
Interpreting the hominin activity areas uncovered in Palaeolithic excavations requires a detailed understanding of the taphonomic and diagenetic processes which may have occurred since site abandonment. With reference to specific sites from the Lower and Middle Palaeolithic, evaluate the methods used in unravelling site formation processes and reconstructing activity areas.