Southampton, 14-16 January, 2016
Unravelling the Palaeolithic

ABSTRACT BOOKLET

http://unravelling2016.wordpress.com/
Unravelling the Palaeolithic 2016 is sponsored by:
Welcome to Unravelling the Palaeolithic!

Welcome to Southampton and Unravelling the Palaeolithic: 15 years of research at the Centre for the Archaeology of Human Origins (CAHO)! It does not seem like five years since we hosted the first symposium in January 2011. There is clearly a lot of interest in student-led symposia on the Palaeolithic and human origins. We hope you will enjoy the wide range of presentations and look forward to your participation in the discussions. Unravelling is a great opportunity for debate, and many of the presenters will welcome constructive feedback and discussion on their papers.

William Davies
Director, CAHO
Brief History of the Centre for the Archaeology of Human Origins

Since its establishment in 2000 by Prof. Clive Gamble, the research conducted by CAHO has been global and interdisciplinary. From the outset, upcoming researchers have been an integral part of the work done by CAHO: our alumni have gone on to work in many fields of Palaeolithic archaeology. Some are now lecturers, whilst others have become researchers, work in heritage consultancy and contracting, or have gone into archaeology planning and policy at national levels. CAHO currently has over 40 active members (University of Southampton staff and post-graduate students); many of our 120+ alumni still keep in touch with us, and have gone on to advance human origins research in many different places.

In its first fifteen years, CAHO research has covered fieldwork and museum based artefact analysis at a national and international level (Piel 6, Cave of Hearths and Ismila in Africa; Corfe Mullen, Broom, Hengistbury Head, La Cotte de Saint-Brelade in the UK and Channel Islands; Dolní Věstonice, Pavlov, Kostenki, Kebara in the Near East and Eastern Europe; early sites in North and South America). CAHO members have been closely involved with many major research projects and consortia over the last 15 years, including the Stage 3 Project (1996 – 2003), the Ice Age Network, EFCHED (Environmental Factors in the Chronology of Human Evolution and Dispersal: 2002 – 2006), Lucy to Language: Archaeology of the Social Brain (2003 – 2010) and RESET (RESponse of humans to abrupt Environmental Transitions: 2008 – 2013). Since 2013, CAHO has obtained some £1.4m in research grant funding for human origins research, enabling six postdoctoral research fellows to study Palaeolithic ceramic technologies (Dr Rebecca Farbstein), Neanderthal Jersey (Dr Marie-Anne Julien and Dr Andrew Shaw), storage and seasonality in the Upper Palaeolithic (Dr Alex Pryor), U-series dating of Upper Palaeolithic cave art (Dr Chris Standish) and the microscopic volcanic ash chronology of the Levant (Dr Dustin White).

CAHO is unique among (UK) centres of human origins research in having a contracting arm (CAHO-Contracting), run by Dr Francis Wenban-Smith. This consultancy service offers desk-based and field investigations throughout southern England. The results of one of these excavations, the elephant butchery site from Ebbsfleet in Kent, was published as a major monograph in 2013.

Research is nevertheless only one face of CAHO. Thanks to the MA in Palaeolithic Archaeology & Human Origins, CAHO researchers train new generations of Palaeolithic archaeologists from all over the world each year. The collections from the mysterious Welsh cave of Pob Ogof has served as a training for many future lithic specialists. As part of their “hands-on” degree, CAHO MA students have had the opportunity to travel to key sites in the UK and France. Many of them continue their interests in their doctoral research, studying and evaluating Palaeolithic dispersals and migrations, Neanderthal blade technology, Palaeolithic funerary practices, Neanderthal landscape provisioning, Palaeolithic social environments, evidence for the evolution of emotions, and the use of techno-ty-
polological variability as a proxy for reconstructing past behaviours and cognitions.

The John Wymer laboratory is the main physical hub of CAHO, housing our teaching collections (both artefacts and fossil casts) and extensive library (incorporating rare and unique volumes, and offprints), as well as postgraduate and postdoctoral researchers. We also have a covered knapping and experimental area outside, for the use of CAHO members, which is frequently used for teaching and research. CAHO events (reading groups, seminars, activities and meetings) are all held in the Wymer lab. You will get the chance to see the Wymer laboratory during the exhibition of paintings by Brian Graham on the evening of Friday, 15th January.

When CAHO was founded, no-one could have foreseen how successful it would become. It has developed into an established academic centre and an incubator of Stone Age specialists, but, most importantly, it provides an inspiring environment for new and established generations of human origins researchers to come together and generate new ideas. I am very pleased to be able to point out that this symposium is the result of the enthusiasm, determination and perseverance of our current new generation of human origins researchers. Once again, we welcome you to Southampton, and dedicate this symposium to all of those who have determined to trace the lives of our earliest ancestors.

William Davies  
Director, CAHO

For more information please see:
• https://www.pathbrite.com/CAHO/profile
• http://www.southampton.ac.uk/archaeology/research/groups/centre_for_the_archaeology_of_human_origins.page

Previous Directors of CAHO:
2004 – 2005: Dr James Steele;  
2005 – 2014: Dr John McNabb;  
2014 – present Dr William Davies.
The organising committee

Members (in alphabetical order):
Cory Cuthbertson, William Davies, Rebecca Farbstein, Samuel Griffiths, Christian Hoggard, Dan Hunt, Marie-Ann Julien, John McNabb, Alexander Pryor, Iza Romanowska, Andy Shaw, Chris Standish, Penny Tsakanikou
The symposium will begin at 13:00 on Thursday 14th January and run until c.16:00 on Saturday 16th January, with lunches provided on both Friday 15th and Saturday 16th.

A drinks reception and poster session will be hosted on the evening of the 14th, and the conference meal will take place on the evening of the 15th along with an exhibition of paintings by Brian Graham.

Presentations have been divided into the following broad themes:

- Palaeolithic Localities and Their Context: new discoveries and advances in the analysis and interpretation of Palaeolithic sites across the world.
- Insights into Palaeolithic Ecologies: food/resource acquisition and use, mobility and subsistence strategies.
- Lithic Technology: raw material provenance studies, technology and typology, quantitative approaches to analysis and interpretation.
- Materials and Methods in the Archaeology of Human Origins: advances in geographical and analytical modelling, experimental approaches to materials, modelling Quaternary palaeoenvironments, and chronology.
- Art, innovation and the social landscapes of Palaeolithic groups.

The Journal of Human Evolution will be sponsoring awards for the best student presentation and the best student poster. The drinks reception is sponsored by Archaeopress and Cambridge University Press.

On the afternoon of Saturday 16th Dr Pia Spry-Marques (University of Cambridge) will lead a workshop aimed at post-graduate students and early career researchers on:

**Securing a popular science book contract**

Have a book idea, but not sure what to do with it? During this informal talk/workshop, Pia Spry-Marques will discuss how to put together a book proposal if you are thinking of writing a popular science book and what to do to get it published.
Venue

Lecture Theatre A, Building 65, Avenue Campus, University of Southampton
SO17 1BF, Southampton, UK

BY RAIL OR COACH

Fast trains from London and Bournemouth/Weymouth stop at Southampton Central and Southampton Airport Parkway. Trains from Portsmouth and Bristol/South Wales stop at Southampton Central. There are also regular trains from major airports such as Gatwick and Heathrow to Southampton Central. You can find details of routes and timetables on the National Rail website.

National Express provides regular coach services to Southampton from central London, Heathrow, Birmingham, Bournemouth and the north. Southampton Coach Station is at Western Esplanade, in the city centre, close to the train station. Some coach services also stop at Highfield Campus.

You can continue your journey to our campuses using the unilink bus services or taxi. Avenue Campus is two miles from Southampton Central. unilink bus: U2B. The unilink bus fare is £2 for a single or £3.50 for an all-day pass. Taxi fares from the city centre are usually £6-10, depending on the campus.

BY CAR

Southampton is 75 miles (120km) from London. The M3 and M27 provide fast, direct access to the city. Postcodes for satnav are listed below for each campus, along with Google Maps directions. From the M3 Exit at junction 14 (Southampton A33). From the M27 For Highfield Campus, Avenue Campus, and also, if coming from the east, for Hospital Campus, exit at junction 5 (Southampton Airport).

BY AIR

Southampton International Airport is a few minutes away from the Southampton campuses by bus or taxi, off junction 5 of the M27. There are flights to Southampton from UK airports and mainland Europe.
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**Conference Dinner (B65 Cafeteria)**
The Middle Stone Age in Eastern Africa and its relationship to the evolution of Homo sapiens: a Turkana perspective

ROBERT FOLEY, HEMA ACHUYTAN, FEDERICA CRIVELARO, PETER GRIFFITH, AURELIEN MOUNIER, ENZA SPINAPOLICE, ANN VAN BAELEN, ALEX WILSHAW, AND MARTA MIRAZÓN LAHR

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Genetic, archaeological and fossil evidence are now routinely used in constructing models of modern human evolution. While all point broadly to the same thing - an evolution of modern morphology and ancestral genetic lineages in late Middle Pleistocene Africa, the chronological, geographical and ecological details are often sparse. This is particularly the case for the early part of the process, in the context of the African Middle Stone Age. In this presentation we review the complexity of current modern human evolutionary models, and consider them in the light of African biogeographical patterns and emerging evidence from fieldwork in West Turkana. We present new data from open-air MSA sites in West Turkana dating to around 300,000 years ago, adding to the complex picture of the behavioural context of early modern humans in Africa.
The Acheulean handaxe: more like a bird’s song than a Beatles’ tune?

Mark Collard1,2, Raymond Corbey3, Adam Jagić3, and Krist Vaesen3,4

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2 Department of Archaeology, University of Aberdeen, UK
3 Faculty of Archaeology, Leiden University, The Netherlands
4 School of Innovation Sciences, Eindhoven University of Technology, The Netherlands

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The goal of this paper is to provoke debate about the nature of the Acheulean handaxe. Specifically, we want to initiate a conversation about whether or not they are cultural objects. Currently it is assumed by the vast majority of archaeologists that the behaviours involved in the production of handaxes were acquired by social learning and that handaxes are therefore cultural objects. However, this hypothesis faces several problems. It underestimates the difficulty of inferring transmission mechanisms from artefacts. It conflicts with cultural evolutionary models and ethnographic data on key characteristics of cultural objects. It is difficult to square with the greatly increased rate of cultural change observed in post-Acheulean industries. And it fails to adequately account for the handaxes that have recently been found beyond the Movius Line, in China. We will argue that these and other problems can be better accommodated by what we have dubbed "the genetic transmission" hypothesis. Proposed by Foley (1987) and Richerson and Boyd (2005), this hypothesis contends that handaxe production was passed on across generations at least in part through genetic inheritance channels. Subsequently, we will use bird behaviours that have a substantial genetic component to illustrate how a behaviour as complex as handaxe production could be under genetic control. Thereafter, will discuss the applicability of the genetic transmission hypothesis to the industries that precede the Acheulean and to those that succeed it. Lastly, we will discuss the implications of the genetic transmission hypothesis for understanding the evolution of hominin behaviour.
Between the River and the Sea: Problems in the Interpretation of Pleistocene Sequences in the Medway Estuary, Kent

Martin Bates

School of Archaeology, History and Anthropology, University of Wales Trinity Saint David, UK

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“The estuary is the point where man, the sea - his immemorial ally and adversary - and the land meet and challenge each other” (U.S. Department of the Interior, National Estuarine Pollution Study, November 1969). Frameworks for contextualising and correlating Palaeolithic sites in southern England are often based on the fluvial archive of major rivers such as the Thames and Solent. These frameworks have been developed through study of sections and exposures in trenches, borehole records and most importantly quarry faces. These works have culminated in the ‘Bridgland Model’ that is now well developed, firmly entrenched in our discipline and forms the basis for integrating the archaeological record with the globally accepted Marine Isotope Record. Many of our key Palaeolithic sites have helped to calibrate this record through biostratigraphy, radiometric dating and palaeoenvironmental reconstructions.

By contrast evidence from the marine sector is based on seismic investigations, limited borehole coverage and minimal archaeological observations. Few sequences have been dated and commonly palaeoenvironmental interpretations are made on the basis of limited evidence. Often the sequences mapped and interpreted differ considerably from those observed in the terrestrial sphere and consequently producing a seamless model from terrestrial to marine sectors is difficult.

The point at which river meets the sea, the estuaries of the lower reaches of our major river valleys, are points where the interface between our two spheres of influence exists. These are the places where terrestrial or marine based frameworks integrate with those from the other sphere and where we are likely to discover elements of both systems interdigitated beneath the ground. Consequently if we are attempting to link on-shore and off-shore sequences this zone is critical to our modelling.

This paper uses the lower Medway Estuary in Kent as a case study to highlight some of the problems facing Quaternary Scientists attempting to interpret the complex evidence in these challenging environments. Two new interglacial sites at Kingsnorth and Allhallows have provided biostratigraphic, geochronological and palaeoenvironmental data that enable us to test the ‘Bridgland Model’ developed for the lower Medway and build an integrated estuarine model for Quaternary landscape development.
This paper presents the first optically stimulated luminescence dating results from the Palaeolithic ‘super site’ Woodgreen in the Avon Valley, Hampshire. Only nineteen ‘super sites’, exceptionally large concentrations of Palaeolithic artefacts, are known in Britain of which two, Woodgreen and Milford Hill, are found in the valley of the River Avon. This area is of interest as it is the main northern tributary to the now submerged Solent River. The floodplains of the Solent River and its tributaries formed important dispersal routes into Britain during the Pleistocene low sea-level stands as is suggested by the large quantity of Palaeolithic artefacts found in these areas. However, the Palaeolithic record from the Avon Valley remains poorly studied. There have been two principal impediments to a full appreciation of this significant record. Firstly, the majority of the Palaeolithic archaeology is derived from Pleistocene fluvial terraces, presenting a complex depositional environment that has been minimally studied. Secondly, an absence of age-markers has limited the chronological understanding of the archaeological record hindering its wider contextualisation.

This research addresses these issues through:

1. a study of the fluvial geomorphology of the Avon Valley using Lidar and borehole data and terrace exposures.
2. dating the sequence of river terraces to understand the timing and nature of terrace formation and Quaternary landscape change, as well as the age of the fluvial deposits from which artefacts are derived,
3. analysis of the Palaeolithic material derived from those terraces.

This approach provides the first dating framework for the Palaeolithic record of this catchment and will allow integration of the Avon record into the wider context of hominin presence in Britain.
Petit Portelet, Jersey: A New Neanderthal Site in Primary Context

Andrew Shaw\(^1\), Martin Bates\(^2\), Richard Bates\(^3\), Matt Pope\(^4\), Anne-Lyse Ravon\(^5\) and Beccy Scott\(^6\)

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\(^2\) Department of Archaeology, University of Wales Trinity Saint David, UK
\(^3\) Department of Earth Sciences, University of St Andrews, UK
\(^4\) Institute of Archaeology, University College London, UK
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\(^6\) Department of Britain, Europe and Prehistory, The British Museum, UK

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Here we report on the newly discovered, primary context Middle Palaeolithic archaeology from Petit Portelet, Jersey. Cut into granite bedrock, two gullies (Central and Western) situated on the modern foreshore have been investigated. Both contain fine grained sediments and have produced surface collections of Middle Palaeolithic stone tools, each reflecting distinct technological strategies (one focussed on Levallois reduction and the other on discoidal flaking). Small scale investigations carried out in July 2015 in the Western Gully identified minimally disturbed, fresh Middle Palaeolithic stone artefacts (including chips) within fine grained silts. Sediments preserved within the cliff sections at Petit Portelet include a raised beach thought to belong to the last interglacial (MIS 5e). The deposits within the Western Gully are attitudinally below the level of this beach, and may therefore predate the last interglacial. The Petit Portelet finds represent the first new Middle Palaeolithic locale to be discovered in Jersey since the 1880s. Coming from the intertidal zone, they offer a new perspective on the Pleistocene archaeological record of the island, and by extension, the wider region. While the Middle Palaeolithic record of Jersey is dominated by La Cotte de St Brelade with an extensive and prolific record (Callow and Cornford 1986) and another important cave site, La Cotte a la Chèvre (Callow 1986), most other Middle Palaeolithic finds from Jersey are isolated artefacts, discovered as contextless, littoral finds. While the assumption has generally been that these artefacts have been released by wave action from deposits preserved in cliff sections, Petit Portelet demonstrates that this is not necessarily the case. We now consider it probable that isolated and un-abraded Middle Palaeolithic artefacts and faunal remains originate from the fine-grained gully fills in the intertidal zone. The Petit Portelet locale forms part of a wider network of submerged Pleistocene capture points preserving fine-grained Middle Palaeolithic archaeological signatures. Such contexts, prevalent around the Normano-Breton Gulf, provide an exciting, new and accessible route into the lost landscapes of La Manche.


This paper proposes a general review of Palaeolithic sites on the Armorican peninsula with a focus on their palaeoenvironmental context. These early settlements of Western France occurred during Pleistocene climate changes; therefore they will be presented within their chronostratigraphical and environmental time frame.

Indeed the pre-Neanderthal and Neanderthal populations that occupied the region were present in both interglacial contexts and the cooler interstadials of glacial phases. From the Lower Palaeolithic until the Last Glacial Maximum of the Upper Palaeolithic people came to settle at different times adapting themselves to the climatic constraints of their period. Consequently numerous occupations took place at the end of interglacial stages, during rather mild conditions. This is the case for several important sites, for example Menez Dregan (Plouhinec, Finistère) and Piégu (Pléneuf-Val-André, Côtes-d’Armor). Contrastingly other occupations happened under periglacial contexts but during these cooler interstadials as seen at the settlements of Les Vallées-Nantois (Pléneuf-Val-André), Grainfollet and Les Gastines, and for the site of Le Mont-Dol (Ille-et-Vilaine).

This work explores how these populations adapted to climatic constraints questioning whether their lithic industries contain technological adaptations to environmental change and what this can tell us in combination with the palaeogeographical data.
New Finds of Incised Schist from the Magdalenian Site of les Varines, Jersey

Ed Blinkhorn¹, Chantal Conneller², Silvia Bello³, Sarah Duffy⁴, Martin Bates⁵, Richard Bates⁶, Marie-Anne Julien⁷, Matt Pope⁴, Beccy Scott⁴, ⁸ Andy Shaw⁷

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² University of Manchester, UK
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⁵ Trinity St.Davids, University of Wales, UK
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The Late Upper Palaeolithic archaeological site at Les Varines is situated to the northeast of St Helier in Jersey, at the head of a south-running dry valley, close to a spring and overlooked by a low granite cliff. Discovered by fieldwalking in the late 1990’s, excavation since 2010 has located the sediments from which material was deriving, and traced a complex series of slope deposits upslope to a point at which primary context archaeology is preserved. Artefact density increased and burnt bone and charcoal were recovered. Over 5000 flint artefacts have been excavated and individually plotted, an assemblage focussed on the production of narrow backed bladelets.

Amongst this material were recovered small, flat pieces of schist, a stone not local to the site, displaying a complex series of incisions. Microscopic analyses of the marks using an Alicona infinity focus optical microscope shows that these are consistent with having been made with stone tools. In this paper we present details of these artefacts, together with their context within the site and its significance.
A Re-Examination of the Late Nineteenth Century Palaeolithic Finds in the Upper Ravensbourne and Cray Valleys in South East England

FRANK BERESFORD

Independant Researcher

f.beresford@btinternet.com

Many palaeolithic sites discovered in the late 19th century lacked adequate publication and coherent curation of the assemblages which were frequently fragmented and dispersed by sale or exchanged or lost. This study focuses on some sites with this type of recent history that are located in the now dry upper valleys of the Ravensbourne and the Cray, adjacent south bank tributaries of the Thames, south east of London. In West Wickham two men, George Clinch and Arthur Santer Kennard, discovered lithic material in the years from 1878 to 1898. In Cudham, the most prolific finds were made in the 1890s by de Barri Crawshay. However, in 1999, John Wymer noted that both West Wickham and Cudham were “alleged to have produced large numbers of surface palaeoliths in the 19th century, but few can now be found or identified as coming from the locations recorded” (Wymer 1999, 167). During the past five years, parts of the original collections and other finds from the same area have been identified and studied in two museums. Partial accounts presented in various contexts that were produced during the period 1882 to 1908 have also been located and studied. Field visits have been made to all sites. Two preliminary reports on the Upper Ravensbourne have already been published (Beresford 2013, 2014) and the two final reports are now in preparation. This presentation is an up to date summary and will include the first reporting on the Upper Cray finds at Cudham.


This paper examines the record of Neanderthal occupation at the cave site of La Cotte à La Chèvre, situated on the north coast of Jersey in the English Channel. It proposes a new research agenda for the Middle-Palaeolithic of the La Manche region focusing on the provenance of raw material and its potential to unlock patterns of Neanderthal landscape use within the submerged and inaccessible area surrounding the site. Crucially, many of the stone tools recovered from Chèvre do not appear to have been made from flint beach pebbles, which are found on the Jersey coast and are of relatively little value in provenance studies. They are in fact more similar to those found in the Weichselian layers at La Cotte de St. Brelade with a high percentage of glossy dark flint and overall low presence of other rock types. This suggests that the Chèvre Neanderthals were using flint from primary Cretaceous deposits, the nearest sources of which are localised but now obscured by high Holocene sea levels. These artefacts consequently provide a prime opportunity for exploring the patterns of landscape use and spatial separation of the chaîne-opératoire. This research critically examines the geochemical techniques available to raw material studies developing methodological frameworks of wider value in Palaeolithic research. In addition a new research paradigm for the off-shore record is presented, one which makes use of an accessible and under-researched terrestrial record to develop models of landscape use within the wider submerged landscapes of the Pleistocene.
In the Paris Basin, open-air Palaeolithic sites generally belong to the final Magdalenian with examples such as Pincevent, Etiolles and Verberie. It is on these sites that the palethnographic approach of A. Leroi-Gourhan and his disciples was elaborated. However, for a long time, periods prior to the end of the Upper Palaeolithic did not focus a lot of attention, certainly because of the absence of well-preserved sites, but also because of a relative lack of interest on behalf of researchers who were working on this vast area. Thanks to a collective research project developed in the early 2000’s at the French National Center for Scientific research (CNRS), entitled “The Early Upper Palaeolithic of the centre and the south of the Paris Basin”, new data were collected leading to the development of an excavation program on the site of Ormesson (Seine-et-Marne) that began in 2009. After seven years of functioning, this program, initially focused on a Gravettian occupation dated 26500 uncal. BP and linked to bison hunting, has permitted the identification of four others occupations ranging from the end of the Middle Palaeolithic to the Badegoulian, and also including the Châtelperronian and the Middle Solutrean periods. The excellent state of preservation of these occupations leads us, besides the study of the environmental context (topography, plant environment, fauna, availability of raw materials, etc.), to a better understanding of subsistence economies and settlements functioning developed during 30000 years of human presence at this site.
Reassessing the Production of Handaxes Versus Flakes from a Functional Perspective

Alastair J. M. Key, Stephen J. Lycett

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2 Department of Anthropology, University at Buffalo, USA

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Bifacially flaked stone tools, traditionally referred to as “handaxes” were produced by Pleistocene hominins for over one million years over three different continents. This spatial and temporal prevalence raises questions about the factors that may have motivated their use as supplements to more simple flake tools. Hence, understanding the comparative functional performance capabilities of flakes and handaxes is essential to understanding factors that may have motivated the repeated production of handaxes during the Pleistocene.

Here, we examine this question using a larger scale experimental approach than has previously been undertaken. We statistically assessed the comparative functional efficiencies of basic flake cutting tools and handaxes when undertaking a series of distinct cutting tasks. Furthermore, for the first time, we examined the functional capabilities of flake tools that are of equal size and mass to handaxes. Our results identify that the specific material context in which these tools are used is key to their relative functional efficiencies, with basic flake cutting tools being significantly more efficient than handaxes when undertaking relatively small, precise cutting tasks. Alternatively, we identify that handaxes are significantly more efficient than basic flake cutting tools when tasked with cutting relatively large, resistant portions of material.

Thus, we conclude the adoption and widespread production of handaxes by Pleistocene hominins was motivated, at least in part, by requirements to undertake this specific type of task, rather than them being inherently superior to flakes in all cutting tasks. Indeed, interestingly, the comparative functional efficiencies of handaxes and flakes of equal size are far less pronounced than expected, with a number of tasks displaying no significant efficiency differences. Subsequently, we stress that a number of other hypothesized advantages of handaxes may have also been key to their widespread production and use by Pleistocene hominins.
‘Stitching up the Edges’: A Photogrammetric Analysis of Acheulean Handaxe Edge Morphologies and Their Potential Importance to the Debate on the Presence of Symmetry in Handaxes

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Handaxes are an iconic tool type of the Acheulean and Lower Palaeolithic, often used as a focus for research in a significant proportion of the literature surrounding both of these themes. However, although receiving a considerable amount of focus, one element of handaxes that has received relatively less attention than other technological components are handaxe edge morphologies. This is partly due to the emphasis placed on handaxe planform shape and typology in debates and research surrounding handaxes, along with some practical drawbacks in analysing and comparing the physical edges in a quantitative manner. This absence of focus is particularly apparent in discussions concerning the presence or absence of symmetry in Acheulean handaxes, a topic with a long history of debate and dispute. The core concept for symmetry has mostly revolved around the notion of planform symmetry and ideas associated with it, such as a conformation to underlying geometric rules like the Golden Ratio, or standardisation of shape due to preconceived mental templates. This debate, although still receiving new input, has largely continued to revolve and carry on in this same direction, focusing mainly on perceived presence/absence of planform symmetry within assemblages.

In order to add new impetus and offer a different angle to this debate, an innovative new analytical approach to analysing handaxes is proposed, which also draws on the relatively under-analysed edge morphologies of handaxes. A new photogrammetric methodology is introduced, using a more detailed and in-depth algorithmic process to build highly accurate and precise 3D models of handaxes. These models allow for new forms of testing and studies to be conducted, which are unrestricted by the physical constraints often imposed when working with the objects themselves. Through this it is hoped a new methodology for analysing handaxe edges can be gained, in order to highlight their importance and value when understanding this iconic tool type and contributing to wider debates, particularly when considering the nature of symmetry within handaxes.
Re-Framing the Transition Between Palaeolithic Reductive Stone Tools and Hafted Technologies: An Observational Analysis of the Relationship Between the Two Types of Tool-Making Activity and Their Underlying Cognitive Processes

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A new analytical method is being developed to assess changes in the cognitive loading imposed by different types of tool-making. The method has its roots in models applied by Occupational Therapists to analyse how variations between cognitive and motor components across tasks affect the outcomes of goal-directed activity. Here it is used in a pilot study to examine changes in the network of cognitive and motor components underlying the transition between reductive and hafted (combinatorial) tool technologies.

An expert knapper was filmed producing in sequence an Oldowan core and flakes; a flake blank worked into a handaxe; and a Levallois core and flakes. Two professional hafted tool makers were also filmed each making two distally cleft-hafted tools. The activities were observed and coded using a set of 30 established variables. Each variable represents a type of behaviour necessary for structuring goal-directed activity. The combined levels at which they appear during any task in question determines the effectiveness with which the activity can end in goal-achievement. Patterns in the representation of the variables across tasks were identified which showed both a continuity of change across all tasks at one level, and a marked difference between reductive and combinatorial technologies at another. This analytical approach is able to discriminate clearly between different tasks and offers a platform for analyzing cognitive change. A refined version of the method has potential for use with an expanded range of tasks in both qualitative and quantitative formats.
Statistical Analysis of Paradigmatic Class Richness Supports Greater Paleoindian Projectile-Point Diversity in Southeastern North America

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Ronald Mason’s hypothesis from the 1960s that the southeastern United States possesses greater Paleoindian projectile-point diversity than other regions is regularly cited, and often assumed to be true, but in fact has never been quantitatively tested. Even if valid, however, the evolutionary meaning of this diversity is contested. Point diversity is often linked to Clovis “origins,” but point diversity could also arise from group fissioning and drift, admixture, adaptation, or multiple founding events, among other possibilities. Before archaeologists can even begin to discuss these scenarios, it is paramount to ensure that what we think we know is representative of reality. To this end we tested Mason’s hypothesis for the first time, using a sample of 1,056 Paleoindian points from eastern North America and employing paradigmatic classification and rigorous statistical tools used in the quantification of ecological biodiversity.

Our first set of analyses, which compared the Southeast to the Northeast, showed that the Southeast did indeed possess significantly greater point-class richness. Although this result was consistent with Mason’s hypothesis, our second set of analyses, which compared the Upper Southeast to the Lower Southeast to the Northeast showed that in terms of point-class richness the Upper Southeast > Lower Southeast > Northeast. Given current chronometric evidence, we suggest that this latter result is consistent with the suggestion that the area of the Ohio, Cumberland, and Tennessee River valleys, as well as the mid-Atlantic coastal plain, were possible initial and secondary “staging areas” for colonizing Paleoindian foragers moving from western to eastern North America.
Subsistence, Mobility, and Food Storage in Upper Palaeolithic Europe

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Food storage is a technological and behavioural adaptation that fundamentally changed the human quest to find food. Storage behaviours are especially suited to the strongly seasonal environments of higher latitudes where cold-season food resources are most limited. As such, storage is postulated as one element in a suite of technological innovations that assisted the expansion of Homo sapiens into new, unfamiliar environments very different from our African homeland.

This presentation reports the first results of a study searching for evidence of food storage at the European Gravettian site of Pavlov I and Late Glacial site of Kostenki 11. By identifying 1) the seasons during which a site was occupied and 2) the actual seasonal availability of prey animals targeted by Palaeolithic groups, we are testing whether food storage can be identified by demonstrating human occupation during a season when none of the major prey species were being killed.

Our methods use strontium (high-resolution measurements by laser ablation) and oxygen isotope measurements and cementum thin sectioning of the same tooth to investigate seasonal mobility and season of death of all major prey species, and charcoal analysis to reconstruct the season of human occupation. The data collected so far will be presented and discussed, emphasising the emerging patterns that will be tested throughout the second half of the project.
The MIS 5e (Eemian) Pluvial Period in Yemen: Greening of the Desert and Opportunity for an Early Homo sapiens Dispersal

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The “Out of Africa II” model claims that Homo sapiens dispersed from Africa, replacing archaic populations in Europe and Asia. The timing of this event is highly debated with two arising hypotheses. One hypothesis favours multiple waves of dispersal during MIS 5 (130-75kya) through the Arabian peninsula, coinciding with pluvial conditions. A late dispersal, however, favours a dispersal after 65kya supported by technological innovation and cognitive advancement. Both hypotheses are subjected to scrutiny as MT-DNA data provides inconsistent results for dispersal dates – depending on the mutation rates utilised. Palaeoclimate data reveals pluvial phases between 130kya and 75kya in Arabia which would have supported waves of dispersal due to the greening of the desert; after 75kya the desert would once again act as a natural barrier against dispersing populations. There is, however, a small pluvial phase at ~65kya. In the past 15 years, stalagmite analysis has provided signals for climatic events and their effect on human societies. Here, revised U-series dates for the onset and termination of the most pluvial event (MIS 5e) and an isotopic analysis of δ18O and δ13C values from a Yemeni stalagmite are produced. Hitherto, the greening of the desert has only been inferred by evidence of increased precipitation; direct δ13C analysis had not been conducted. Results indicated that MIS 5e had an onset at ~128kya and termination at ~117kya (~11kyrs duration); oxygen isotopes reveal increased precipitation in Arabia due to the movement of the Indian Summer Monsoon; carbon isotopes indicate a savannah environment was present in Arabia during the MIS 5e pluvial event. Isotope values advocate monsoonal rains supported freshwater river systems, and a savannah environment suitable for Homo sapiens to inhabit and successfully disperse into Asia during the MIS 5 interglacial.
When Sooted Concretions Become Micro-chronological Archaeology: Establishment of Occupations’ Chronicles in Grotte Mandrin and Implications for Our Understanding of Mobility Strategies

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Soot deposits trapped in concretions (speleothems, travertines, carbonated crusts, etc.) are witnesses of human occupations in cavities. We developed an analytical methodology whereby soot deposits can be counted and their position in concretion can be documented, allowing identification of seasons of occupation in the cavity. These researches show that sooted concretions analysis enables the development of high temporal resolution archaeology, just like dendrochronology does for more recent periods. There is a real possibility for extending this pioneering study to cavities of all ages and areas, from Lower Palaeolithic, with the first traces of fire, to medieval or even modern times. Results have different implications depending on the concerned contexts.

One of the major areas of application is hominine’s mobility study, since sooted concretions turned out to be a perfectly suitable material for micro-chronologic studies with an unexpected high temporal resolution. At the Grotte Mandrin rock shelter (Drôme, France), thousands of clastic fragments from the walls were found in each archaeological level. Their surfaces sometimes wear calcrite crusts containing soot deposits, which appear as thin black laminae. Microscopic observation of these crusts revealed that they kept track of many hominine occupations. It is possible to link them with the archaeological units identified during the excavation. The MNP (Minimum Number of Passages) are usually high and correspond to each archaeological layer. They attest of the cumulative nature of those units and provide data on the mobility level of the past hominine groups whom occupied the rock shelter. The positions of soot films in concretions with annual lamination can also provide information about the dynamics of occupation of the cavity by past societies.

This study shows also that a very short time separates the Middle/Upper Palaeolithic transitional groups’ occupations from those of the last Mousterians in Grotte Mandrin. The research perspectives on soot deposits are diversified and raise the possibility to study past human groups, and in this case to rethink the Middle/Upper Palaeolithic transition with an unmatched temporal resolution. Presentation will focus on methodological questions, first results in Grotte Mandrin and their implications.
Of Horses and Reindeer: Zooarchaeological Research on the Late Pleniglacial Site of Korman 9 (Ukraine)

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Research on how modern humans adapted their subsistence strategies to the shifting climatic and environmental conditions of the Pleistocene is a recurring theme in zooarchaeological studies. The study of archaeological faunal specimens can provide a wealth of data ranging from the kinds of taxa hunted by Palaeolithic peoples to how bones and sites may have been disturbed by a range of agents and processes, all of which have the potential to inform (or misinform) us on past human diets and adaptations. This paper presents the data derived from the study of the zooarchaeological assemblage excavated at the Late Pleniglacial site of Korman 9, located on a c. 40-metre long and 5-metre deep succession of loess deposits and tundra gley and humic horizons in the Middle Dniester valley. Recent fieldwork in this area involving survey and test-excavations of sites newly-exposed by the Dniester reservoir lake have provided us with this unique opportunity to study previously-inaccessible assemblages dating to the Upper Palaeolithic, in the case of Korman 9, and also to the Middle Palaeolithic. The analysis of the fauna excavated at Korman 9 has revealed the hunting of horse (Equus ferus), reindeer (Rangifer tarandus) and hare (Lepus sp.) in the Middle Dniester valley during this period, the significance of which in terms of modern-human adaptations to climatic and environmental change will also be discussed here.

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Recent Investigations into the Stone Age Site of Isimila, Tanzania

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The Stone Age site of Isimila is located on the Iringa plateau, Tanzania, close to the East African Rift Valley. Due to the abundance of handaxes present at the site in both primary and secondary contexts, Isimila has long been recognised as a key site of international importance for understanding the behavioural complexity of our hominin ancestors often compared alongside major East African e.g. Kalambo Falls, Olduvai Gorge and Olorgesailie (Kleindienst and Keller 1976; Mcbrearty 1978). Despite the international significance of Isimila, the chronology, taphonomy and geomorphology of the site remain poorly understood, and are in urgent need of re-examination using modern analytical techniques and theoretical perspectives. Previous dating efforts (a single U-series date from a bone sample) gave an age estimate of 260 kya for the site (Howell et al. 1972). However, this date is problematic due to methodological inadequacies and therefore it is timely to undertake a re-characterisation of Isimila. The subject of this paper is to therefore give details of a new OSL dating and raw material provenance programme undertaken at Isimila in 2014 and 2015 that allows, for the first time, a chronological contextualisation of this unique and important Stone Age site within the broader setting of the East African Palaeolithic.
Middle Palaeolithic Finds in the Wadi Gamal, Western Delta, Egypt: Analysis of New in situ and Surface Findings

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Following a presentation at ‘Unravelling’ in Oxford (2015) further fieldwork has taken place on the Pleistocene Terraces of the Wadi Gamal, revealing in situ Middle Palaeolithic stone tools for the first time. The finds consist of a small sample of chipped stone artefacts of homogeneous local chert originating from the Wadi area that were found during the excavation of targeted test trenches in the Wadi Gamal. Most of these lithic artefacts indicate the use of Levallois technology. The edges of many flakes are surprisingly sharp, showing little or no rolling, suggesting little post-depositional movement. The excavation in particular of Areas 36, 38, 2 and 3 suggest proximity to a Middle Palaeolithic activity area, and only further investigations in 2016/17 will be able to reveal this. This presentation will also show the results of analysis on selected Middle Palaeolithic artefacts collected as part of a surface survey also on the Wadi. Hitherto this corner of North Africa had been a blank spot in terms of information concerning modern human presence in the area, with only sparse surface scatters of Middle Palaeolithic artefacts. The in situ finds, however, begin to shed new light on the northern Nile Valley and the movement of modern humans through the area.
This paper focuses on new research into the Stone Age of the Kagera River, which flows through Uganda, Tanzania and Rwanda. To date the LEAP Nile Project has focussed on: the excavation of two new sites in Uganda, Rubirizi 1 and 2; geoarchaeological survey, particularly along the lower and middle reaches of the river; and the analysis of materials from the Tanzanian site of Nyabusora which was excavated in the 1930s and 1950s but never fully published. The interdisciplinary landscape approach adopted, has demonstrated that this area has great potential in contributing to debates on East African Quaternary landscape change and the evolution of our species.

An overview of preliminary results from the survey and excavations at both Rubirizi and Nyabusora will be presented, including OSL dates from the excavations at Rubirizi which yielded Sangoan tools. Fewer than five Sangoan sites have ever been reliably chronometrically dated, and the sites at Rubirizi represent the first chronometrically dated Early-Middle Stone Age sites in Uganda. It is clear that while some elements of the lithic assemblages resemble artefacts from sites of comparable antiquity further east, particularly the bifacial elements are locally distinctive and differ from Early Stone Age (Acheulean) assemblages. This implications of such similarities and differences will be considered, specifically in relation to notions of innovation and embodied technological practice as well as more traditional concerns such as function. Although it is not yet known which species of hominin produced these lithics it is hoped that the renewed interest in this important area will establish the western rift region as one that is just as relevant to debates concerning the evolution of Homo sapiens as areas further east.
Palaeoenvironments Surrounding the Main Achuelean Occurrences (ca. 0.99 Ma) at Kilombe Revealed via a Rock Magnetic Approach of Particle Size Analysis

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The paucity of organic remains at Kilombe necessitates the use of geological proxies (environmental magnetism and geochemistry) in reconstructing environmental change. Whilst both proxies have proven valuable for evaluating long-term trends in climate change via changes in intensity of chemical weathering and pedogenesis at this site, interpreting trends on shorter timescales has proven difficult due to the number of autogenic factors including volcanic activity and dissolution affecting various parts of the sequence, specifically the main artefact horizon.

Sediment dynamics in both terrestrial and marine environments can be assessed by rock-magnetic and granulometric approaches. While traditional grain size analysis by either sieving, use of settling tubes or coulter laser diffracton mainly provides information on composition and transport, the magnetic mineral assemblages can also reveal to a greater degree the weathering conditions in the sediment source area. Here, we combine both methods to investigate the Quaternary sediments surrounding the main Achuelean occurrences at Kilombe which are shown to have been affected by dissolution.

This paper presents the results of a novel approach in quantifying the effects of dissolution on specific particle size fractions of bulk sediment samples at Kilombe using magnetic measurements. Results reveal a significant reduction in concentration of magnetite and loss of the superparamagnetic component across the < 2 micron fraction, and the progressive formation of the iron sulphide greigite from coarser to finer particle size fractions. Overall, results suggest that an increase in sediment accumulation rates resulting in rapid burial conditions is responsible for the dissolution in the Kilombe sediments which in turn may be linked to increased rates of erosion under much wetter conditions. These very much localised conditions are coeval with much wetter but highly variable climates across the Central Rift ca. 1 Ma.
The Curious Case of the Palaeolithic of Qatar

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The Arabian Peninsula, located as it is between Africa and Asia, is now generally considered to have been a nexus of Palaeolithic activity. However, the State of Qatar, a small peninsula extending northwards into the Arabian Gulf, was still thought to lack any evidence of Palaeolithic occupation, with the earliest finds categorised as Neolithic. Many lithic assemblages collected by the Danish Archaeological Expedition to Qatar during the 1950s and 1960s were identified as Palaeolithic by Holger Kapel (the expedition’s lithic specialist). From the 1970s onwards, following a series of misunderstandings and misinterpretations by others, this definition was generally dismissed by subsequent researchers, resulting in the curtailment of Palaeolithic research in Qatar and the region for over 30 years.

This paper reports on the extensive fieldwork carried out by the PADMAC Unit as Phase 1 of the PADMAC Unit Palaeolithic Research Agenda for Qatar, which has resulted, to date, in the identification of 35 Palaeolithic surface-scatters/sites, including five early Lower Palaeolithic knapping sites, and intriguing evidence of the Middle/Upper Palaeolithic transition in Arabia. Currently, no Acheulian or Middle Palaeolithic evidence has been identified. The Unit’s technological and typological analyses of the Qatar lithic assemblages, which affirm Kapel’s original interpretations, have been reported recently (Scott-Jackson, et. al. 2015), but here, this paper focuses on the techniques and experimental methodologies developed and used by the PADMAC Unit to discover these Palaeolithic surface-scatters/sites and to explore their spatial, geological and geomorphological contexts. Surface-scatters/sites represent by far the greatest body of evidence for Palaeolithic occupation of Arabia and provide valuable insights into the landuse preferences of these early hominins, supplementing the environmental and dating evidence revealed by the few excavated sites investigated to date.
Re-assessing the quality of published radiocarbon dates of the Middle and Upper Palaeolithic in Europe

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Radiocarbon dating the presence of humans is crucial in the Neanderthal – Modern Human co-occurrence debate. The accuracy and precision of these dates has been greatly improved over the past years following changes in sampling methods, dating techniques and the advent of Bayesian analyses. Using only the newest dates, produced by the latest techniques, is not sufficient to study human presence in Europe. The inclusion of radiocarbon dates made by older techniques is therefore necessary. The older techniques have drawbacks and the quality and accuracy of the radiocarbon date is variable. Scholars have provided tools to ‘cleanse’ databases by grading individual dates and selecting only the best ones for inclusion (Pettitt et al. 2003). However, there doesn’t seem to be a general acceptance of these tools, and many researchers still create their own auditing criteria (Graf 2009; Lorenzen et al. 2011; Stuart and Lister 2012).

Therefore we have explored the variables that influence the eventual quality of the radiocarbon dates and created new, simplified auditing schemes that are presented here. The auditing schemes takes the most common sample materials (bone gelatin, charcoal, shell and lignite), methods in pretreatment and measurement, as well as context into consideration, combined with what information accompanies the published radiocarbon date. Following the schemes, the researchers can attach a measure of quality to the radiocarbon date and decide whether to include it in their research. The auditing schemes have been tested on re-dated sites, to account for both the older as well as more recent techniques. The auditing schemes prove successful and easy to use. We argue that by adopting this standardised way of auditing radiocarbon dates, comparison of studies in Palaeolithic Europe is improved and will lead to more realistic results.
People Make Practice: How Networks and Metapopulations Can Help Us Understand the Lower to Middle Palaeolithic Transition

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Traditional interpretations of the Lower to Middle Palaeolithic transition present a broad sweeping change from traditional core and flake industries, often with a bifacial element, normally typified by the Acheulean, to a wholesale adoption of prepared core technologies such as Levallois. Examination of the archaeological record in a single region, for example Central Europe, and with any detail, shows this characterisation to be one that fails to highlight the variety of, and subsequent changes, in technological practice present during the period from 400 to 200 thousand years ago (kya).

By adopting a theoretical approach inspired by metapopulation ecology, I hope to explore how factors such as, population density, and changes in environmental affordance, may have affected the transfer of information and practice across social networks during the Lower to Middle Palaeolithic. It should be possible to create an agent-based model (ABM) to explore the nature of cultural transmission and the maintenance of practice during the period in question.

It is hoped that this will provide further evidence for reimagining the Lower to Middle Palaeolithic transition as a nuanced, localised, event which happened in different places at different scales.
The Chronology of the Last Neanderthals and the First Modern Humans in Eastern Europe: Current State of Research and New Results

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The arrival of anatomically modern humans (AMHs) in Eurasia has long been an active and vigorously contested area of research. Recent developments in ancient DNA analysis and improved dating using radiocarbon, luminescence methods and tephrochronology have transformed the debate and led to some breakthroughs in our understanding of this period. Nevertheless, much work remains to be done. Furthermore, there are many outstanding issues in the archaeology of this period, particularly concerning the attribution of various assemblages and “transitional” lithic industries to one population or another.

This presentation focuses on Eastern Europe and sets out the current state of research in this region and some crucial chronological issues that require further work. The attribution of the Bohunician and other industries and many key assemblages to Neanderthals or AMHs remains uncertain. In addition, modern-day political boundaries have affected research approaches and results, distorting our picture of the data.

The PalaeoChron project (www.palaeochron.org) seeks to improve the chronology of the arrival of AMHs in Eurasia with a large-scale dating programme using radiocarbon and luminescence techniques. The application of improved dating protocols and relatively novel methods such as single amino acid radiocarbon dating, Bayesian modelling of dates, and ZooMS holds great potential for resolving some of the chronological problems we currently face. Here we present some of the first results of the project and outline future plans.
Scratches, Scrapes and Splits: Marks and Breaks on the Earliest Weapons

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Plain wooden spears represent the earliest known weapons in the archaeological record and have come from Middle and Late Pleistocene sites in Europe and Australia. Ethnographic use of wooden spears is known from Oceania, North and South America, and Africa, where they were reportedly used as weapons for hunting and interpersonal violence. In spite of some of the archaeological spears being discovered in contexts signaling human predation, their function remains poorly understood. A better understanding of these weapons as tools for self-defence, as thrusting spears, hand-thrown spears or as weapons with multiple uses would aid in interpretations of these sites, and of hominin subsistence strategies in the Pleistocene.

Use-wear analysis on lithics has become a key area of research in interpreting the function of stone tools. It has been widely used as a method for interpreting lithic points potentially designed for weapon use. Similar methods could potentially provide an additional line of evidence for understanding the use of wooden spears. However, few studies exist on interpreting the marks on wooden spears, and have generally focused on tool marks. Other possibilities exist for the cause of such marks on wooden tools, including marks resulting from use, taphonomic processes and post-excavation handling.

This paper presents results of marks and breaks resulting from use in experimental work, using wooden spears in thrusting and throwing activities. Results of macro- and microscopic imaging of the marks and break on the wooden point from Clacton-on-Sea dating to ~400,000 BP, and marks on the wooden spear from Lehringen dating to ~125,000 BP will be presented. Marks observed on ethnographic spears from museum collections will also be discussed, including tool marks, evidence of resharpening, and marks potentially resulting from use. Future work, limitations, and potential methodologies for exploring the scratches, scrapes and splits on these early organic artefacts will be discussed.
The Versatilist’s Story of Human Dispersal: Climate Fluctuation, Adaptation and the Evolution of Human Uniqueness

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The Variability Selection Hypothesis proposed by Potts (1996; 1998) postulates the evolution of behavioural plasticity among early hominins arising during periods of strong environmental fluctuations in the last 6 million years. It argues that the inconsistency in selection regimes caused by the rapid environmental fluctuations produced particularly strong selection pressure on adapting to change rather than any particular set of environmental conditions.

This promoted adaptive changes leading to a higher level of behavioural plasticity and the evolution of organisms which can be described as ‘versatilists’, for example, early hominins. Here, we present an extension of the single locus model by Grove (2011) - the first formalisation of the Variability Selection Hypothesis into a mathematical framework.

The current implementation aims to assess the implications of the Variability Selection Hypothesis on the agents ability to disperse - a process visible in the archaeological record. The model was translated into a stochastic multi-agent simulation to investigate the dynamics between individuals with different positions and range on the adaptative spectrum (including the ‘versatilist’ individuals) within a non-homogenous population. The particular focus of this presentation is on the spatial structuring of the migration wave and the question of what characteristics of the original population play a role in its ability to disperse.
Episodic Sedimentary Regimes and Palaeolithic Histories

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In temperate latitudes, cave sequences are commonly characterised by episodic depositional regimes. Episodes or ‘phases’ of sedimentation can often be linked to broad scale environmental conditions. For example, pulses of regional climatic deterioration might be expressed in the sedimentary record by the occurrence of physically weathered rock (eboulis) and warmer climatic interludes may result in sedimentation with in-situ or re-worked pedogenic elements. Temporal gaps or ‘sedimentary hiatuses’ that occur between major pulses of sedimentation are both climatically and culturally significant. Gaps in sedimentation can sometimes span several thousand years and human occupations occurring during these times may leave palimpsest accumulations of cultural material on ground surfaces which are not accreting volume through natural geomorphic processes.

If sedimentary hiatuses remain unrecognised during archaeological investigations, material of drastically different ages can become mixed. This can have big implications for our understanding of Palaeolithic history and can give rise to systemic narratives of gradual evolution during the Palaeolithic. Such narratives may be unexpected in temperate latitudes given the rapid climatic oscillations that characterise much of the Palaeolithic timescale. We should perhaps expect more punctuated and abrupt cultural changes, in tune with adaptations to rapidly changing environments.

This paper reviews the significance of episodic sedimentary processes at two typical Palaeolithic cave sites: The Haua Fteah in Libya and Shanidar Cave in Iraqi Kurdistan. Both sites were excavated c.50-60 years ago and have been instrumental in the construction of Palaeolithic narratives ever since. They are primary records in the northern hemispheric history of hominin evolution and the spatio-temporal emergence of Homo Sapiens. At the Haua Fteah, a deep, high-resolution, sedimentary sequence spans c.150 ka years and human occupations are recorded intermittently throughout this timeframe. Shanidar Cave is perhaps most famous for its Neanderthal fossil record and Upper Palaeolithic lithic industries, both of which have an intricate relationship to the sedimentological record. The historical excavations at Haua Fteah and Shanidar Cave are compared with new data from renewed investigations. An understanding of episodic sediment process is shown to be fundamental to understanding the cultural remains in these archives.
New Radiometric Ages for the Palaeolithic Site of Riparo Mochi, Italy

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The rockshelter of Riparo Mochi, located on the Ligurian coast of Italy, is one of the most important early Upper Palaeolithic sites on the Mediterranean rim. It has been extensively studied for the past 70 years. It has a substantial stratigraphic sequence of ~15m deep spanning the Upper Palaeolithic to the Mousterian, including several semi-sterile deposits which give some confidence that there is not extensive mixing between different archaeological levels.

Mochi is the type-site for the Proto-Aurignacian. A series of radiometric dates on marine shells bearing traces of human modification has provided a chronological framework for this and for the final Mousterian at the site (Douka et al., 2012). Based on the modeling results, the end of the Mousterian has been estimated to date between 44 and 41.8 ka cal BP (68.2% prob.) and the Proto-Aurignacian at ~37 ka BP or 42.7-41.6 ka cal BP (68.2%). This appears to be the oldest dated Aurignacian assemblage in Italy. The sequence continues upwards with a more evolved Aurignacian phase and, later, a Gravettian phase which starts at ~26 ka BP or earlier. Given the very limited number of available materials for radiocarbon dating from the final Mousterian levels (bone has been tested but there is no collagen remaining), we decided to collect sediment samples for Optically Stimulated Luminescence (OSL) dating techniques, which provide a promising opportunity to date this important sedimentary succession.

In the present study, OSL ages will be presented along with available radiocarbon dates. This allows us to compare the results from two different techniques. The combination of the results using a Bayesian modeling approach allows us for the first time, to produce a more precise chronology for the Mousterian phases at the site, as well as to consider in greater detail the period during which the last Mousterian gave way to the early Upper Palaeolithic phases. The different periods of human occupation can be placed within an improved chronological framework which will aid us in considering the relationship between humans and palaeoenvironmental and palaeoclimatic variations in the Palaeolithic of Liguria and southern France.
Demography, Networks and Information Exchange in the European Upper Palaeolithic

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Much recent literature has focused on population size as a key factor in the survival and transmission of innovations (e.g. Shennan 2000, 2001). However, the level of connectedness within and between groups, is of equal, if not greater, importance: if a large population comprises a mosaic of closed social networks, potential for transmission of innovations will be restricted.

This talk will consider how we construct spatio-temporal distribution boundaries for “diagnostic” artefact types and technologies, and how we can (and cannot) relate them to reconstructions of population organisation and continuity. We shall examine the social landscapes (boundaries, communication routes, mobility of people and ideas) of the European Upper Palaeolithic using the case-studies of Aurignacian beads and pendants (Vanhaeren & d’Errico 2006) and Upper Palaeolithic ceramic technologies.


In order to understand hominin minds we need new ways of deriving predictions about their cognitive processes and mechanisms. We will show how Theory of Mind can be used to generate hypotheses about the cognitive abilities and behaviours of Palaeolithic hominins, which can be empirically tested against archaeological materials.

Theory of Mind is the ability to think about thoughts, or to conceptualise other agents as having their own mental states (such as desires, beliefs, and knowledge). It is essential for many complex, ‘higher’ cognitive processes such as social learning, language, and social emotions. It has been the subject of over 40 years of well-funded interdisciplinary research in education, psychology, and medicine. Special attention has focused on the cognitive and social deficits that emerge when Theory of Mind is impaired or delayed (such as in autism, schizophrenia, and language delay).

This research can be particularly relevant for archaeologists seeking to build models of emerging cognitive complexity, as behaviours underpinned by Theory of Mind can manifest themselves materially (for example, in tool standardization). Identification of hominin behaviours that required Theory of Mind provides information about other abilities that must also have been present (such as joint attention, imitation, and features of language). Using a series of case studies we will sketch a preliminary picture of emerging Theory of Mind in hominins, and the implications of this for understanding cumulative culture and style, art and religion, social organisation, landscape use, and the creation of referential objects.

This presentation aims to establish Theory of Mind as an interdisciplinary tool for generating testable predictions about ancient human minds. We aim to demonstrate to Palaeolithic archaeologists the potential this approach has to aid research in uncovering the cognitive evidence that lies in the material record.
Assessing Potential Applied Haematite Samples: New data for Cathole Cave, Gower Peninsula, South Wales

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Discovered in September 2010 was a probable Late Upper Palaeolithic engraving of a cervid in Cathole Cave on the Gower Peninsula in South Wales. A team from the University of Bristol along with members of the NERC-Open University Uranium Series Facility extracted samples from the surface on which the engraving was made in April 2012, together with a sample from a section of flowstone covering part of the reindeer’s muzzle; the samples taken where for Uranium Series dating. Several dates of 12,572 ± 600 years BP and 14,505 ± 560 years BP was obtained from the overlying flowstone, suggesting a minimum age for the engraving. This discovery prompted the author to explore the cave with a greater degree of scrutiny. As part of the remit to record this and other features within the cave, the Welsh heritage agency CADW commissioned a 3D digital survey of the main gallery and side chambers of the cave. This survey allowed the team to produce an accurate and definitive plan of the cave. In addition, a further exploratory survey was undertaken in July 2012 where the majority of the accessible surfaces of the cave were explored. This presentation describes the results of that phase of work, along with the results of samples taken from a possible haematite surface for RAMAN spectrometry and x-microfluorescence analysis.
Neanderthal Technological Behaviour During European Middle Palaeolithic: Production and Function of Pointed Tools

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This paper represents a summary of an ongoing research project focused on stone projectile technology during Middle Palaeolithic in South-western Europe. The first aim of the project is to understand whether Neanderthals were able to produce complex throwing weapons, most likely connected with subsistence activities. The use of stone projectile weapons is an advanced technological behaviour, which presumes a high level of cognition, a capacity for abstraction and to plan ahead, in order to supply every single component of the weapon.

Several analytical methods are used to examine convergent stone tools (Levallois points) from three Middle Palaeolithic sites located in southern France, Catalonia, and Italy. A technofunctional analysis of convergent stone tools is set to reconstruct the chaînes opératoires and the preferential operational schemes employed for the debitage, while use-wear analysis are concentrated upon specific patterns of tool utilizations (impact fractures, hafting marks, micropolish).

Preliminary results of macro-wear analysis and further understanding of the dataset for this project might produce fascinating outcomes about the multi-functionality of convergent stone tools and suggest the growing importance of complex throwing technologies in the European Middle Palaeolithic.
The Placement of the Hummalian in the Context of Early Middle Palaeolthic Blade Industries in Levant

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In the Near East, the laminar phenomenon appears at the end of the Lower Palaeolithic immediately following the Acheulo-Yabrudian and is then seen systematically in the Early Middle Palaeolithic (EMP) and later in the heart of the Middle Palaeolithic. The excavation at Hummal located in the arid steppe of Central Syria produced blade industries located in the stratigraphy between the Yabrudian and Levalloiso-Mousterian and this sequence is dated to about 200 ky. Today the Hummalian industry is seen as a single, but very complex reduction strategy related to both the Laminar and the Levallois-like system of debitage. It is a unique reduction system containing diverse types of core volume management. However, the Hummalian still shares many techno-typological similarities with the others laminar, lithic assemblages found on the EMP sites in Levant, the same chronological and stratigraphical position and similar land-use strategies.

Applying only the Tabun sequence with its Tabun D-type as a hallmark of the EMP in the Levant seems to be oversimplified. The EMP blade industries in Levant are predated by the Acheulo-Yabrudian techno-complex showing the production of thick side-scrapers and blades and handaxes. Thus, it seems that the changeover between both these lithic complexes is not only seen in chronological boundary but also imply the technological discontinuity and possibly a change in human populations. However, this systematic manufacturing of blades revealed on EMP sites could also represent the further, regional development of tradition of blade production already seen in Amudian and Pre-Aurignacien industries. The dating of Amudian in Qesem Cave placing this blade industry at MIS8/7 can support the local transformation of this phenomenon. Furthermore, in Tabun, Jelinek described Unit X as the evidence of cultural continuity since the technological and typological features of both Unit XI (Ea/Amudian) and Unit IX (Tabun D) are demonstrated in this single lithic assemblage. The lithic assemblage seems to conglomerate the Mughran tradition and elements of succeeding EMP complexes implying a cultural continuum rather than a hiatus. Recent progress in lithic technological studies and radiometric dating allow advance discussion of this phenomenon.
Simple Cores, Complex Minds: an Assessment of Variation in Lower Palaeolithic Core Working Technologies with Implications for the Origins of Levallois

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The widespread appearance of Levallois technology approximately 300,000 years ago, in Europe and Africa, is associated with significant behavioural and cognitive changes. The origins of this technique, however, are still highly debated. Fully developed Levallois reduction sequences seem to have their roots in a lesser-understood technique referred to as either ‘proto’, or ‘reduced’ Levallois, and more recently as Simple Prepared Core (SPC) technology. Identical reduction techniques have been identified in nine of the ten assemblages examined for this research. This has allowed for the construction of a new overarching technological definition of SPC technology which is now accepted to be present on a significantly wider scale both temporally and geographically. This paper examines the behavioural implications of technological relationship between SPCs and the Levallois technique whilst exploring the significance of the presence of SPC technology in the Lower Palaeolithic archaeological record of northwest Europe.

A clear conceptual link between SPC technology and the Levallois technique is apparent regarding the approach to the volume of the core and the targeted end product. However the lack of shaping of the preferential flaking surface prevents the SPC end products from being considered predetermined. As it is the predetermination of the final product that is linked with the cognitive complexity required to implement the Levallois technique, the hominins responsible for SPCs cannot be considered to demonstrate the same level of cognition as those with Levallois technology.
Bringing it All Back Home? Middle and Upper Palaeolithic Raw Material Constraints and Hominin Adaptational Strategies at Shanidar Cave, Iraqi Kurdistan

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With renewed excavations at Shanidar Cave in the northern Zagros Mountains of Iraqi Kurdistan, the first glimpses of hominin behaviour to have come out in more than half a century tells a story of severe raw material constraints exposed through strategies of lithic reduction. With lithics reflecting local landscape, the reduction strategies recently disclosed at Shanidar suggest intensive use of raw materials by small groups of hominins repeatedly over an extended period of time.

In an effort to quantify and contextualise the new evidence from Shanidar Cave, the resilience and resourcefulness of Neanderthals and modern humans in the face of the environmental deterioration of the late Middle and Early Upper Palaeolithic will be traced though a conceptual transect across Southwest Asia, tracking changes in hominin adaptational strategies through three distinct bio-geographical zones: from the highlands of the Zagros Mountains, over the steppe desert of the Syrian jazira, to the coastal plains of the Levant.

Adopting a methodology employing notions of mobility, land-use, and tool curation, the socio-economic complexity behind the technological decision making processes invested in the production of stone tools will be sought explained as responses to changing environments and raw material availability as hominins negotiate patterns of seasonality.

Earlier studies have tried to test the hypothesis that certain Zagros cave sites, situated above ca. 750 m.a.s.l., were exclusively occupied during short summer forays. While generally accepted on circumstantial evidence, the question of seasonal patterns at other times of the year, in contrast, has been identified as an important subject of research.

Hypothesising about non-summer movements of hominin groups away from the Zagros Mountains will be based on a bold conjecture involving an attempt to couple highland summer camps with winter occupations within the lowlands of another region.

While we await forthcoming new dates from the Middle Palaeolithic layers at Shanidar Cave, the fresh dates obtained from the Upper Palaeolithic stratigraphy makes possible the foundation for situating its lithic industries within a broader, more secure, regional framework.
In this study we compare the frequency, severity and location of enamel chipping (i.e., pressure flaking of tooth enamel) in multiple hominin species, with a focus on the newly discovered Homo naledi material. Original specimens were examined macroscopically, with a 10x hand lens used to help clarify whether a chip was of ante- or post-mortem origin. Permanent teeth with complete crowns evidencing at least some occlusal wear are included. The results agree with prior research showing Australopithecus and Paranthropus have overlapping ante-mortem chipping rates across tooth groups, ranging from 5 to 15%. However, fossils assigned to Australopithecus tend to have more chips per dentition than Paranthropus. In contrast H. naledi shows far higher rates than either, with 40% of teeth affected. Specifically, 53% of molars, 42% of premolars and 23% of anterior teeth have at least one chip; of these, 50% have two or more. Primary teeth are less affected with 14% of teeth having chips. Maxillary teeth are slightly more affected than mandibular (42% and 37% respectively), and 78% is located interproximally. Particularly common are several small chips above molar wear facets.

By way of comparison, only a few published archaeological samples have comparable frequencies, e.g., Inuit and a Scandinavian medieval population. Potential causes for this high rate in H. naledi may include dietary and non-masticatory causes, as well as morphological features such as enamel thicknesses. Due to the amount of chipping within the sample it is clear that teeth were exposed to regular acute trauma. The fact that interproximal areas are more affected than buccal, and posterior teeth more so than anterior is suggestive of a dietary cause rather than non-masticatory. A diet containing particularly hard, resistant food, or contaminants such as sand or grit seems likely. Diagnostic angled molar wear in the sample, as well as the small size (89% <0.5mm in diameter or show only superficial enamel flake loss) of the chips is supportive of the latter possibility. Overall, differences compared with other Plio-Pleistocene African hominins suggest that the H. naledi diet differed – in terms of food type or, more likely, contaminants therein.
This paper examines interactions between co-occupants of riverine niches in North West Europe during the Late Upper Palaeolithic using both ecological and archaeological data. It is argued that consideration of both the Lateglacial record and autecology of eel, beaver and horse supports a reinterpretation of some famous but enigmatic panels of Magdelenian mobiliary art as representations of eel fishing, along with horse and beaver exploitation in disturbed riverine habitats. It is further suggested that this constitutes a humanly constructed niche in both ecological and symbolic terms, which was also advantageous for human well-being and development during this period.
POSTER PRESENTATIONS
Quantitative Approaches to Understanding Biface Patterns at Olorgesailie, Kenya

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Appearing at around 1.7 million years ago and lasting for approximately one million years, the Acheulean represents a time period and technocomplex that has attracted a wide interest and much investigation. However, from a statistical perspective, previous research into inter-assemblage variability of bifaces at Acheulean sites have largely focused on variables such as shape, form and dimensional ratios (e.g. height/breadth) as well as raw material properties and use, while less attention has been paid to statistical quantitative analyses relating to frequency ratios of the occurrence of bifaces and other tool categories in Acheulean assemblages. Here, an attempt has been made to investigate intersite variability observed in bifaces patterns through statistical correlation analysis, using the typological lithic data from 17 assemblages from the Acheulean site of Olorgesailie, Kenya.

The goals of this research was to (a) test through statistical methods whether the observed dichotomy between the two different tool categories of bifaces and scrapers actually exists at Olorgesailie, and (b) with reference to existing hypotheses about lithic variability in Acheulean assemblages discuss the natural and behavioural processes which may have helped in the deposition and creation of these assemblages. By using Spearman’s rank correlation tests for the frequency and proportions of bifaces as compared to frequency and proportion of scrapers and comparing with artefact density and level of disturbance it was possible to unravel a pattern.

The results of this study revealed a negative correlation between the proportions of scrapers and bifaces across the lithic assemblages at Olorgesailie. It was also found that there is a statistically significant correlation between frequency and proportions of bifaces and level of disturbance across all 17 sites, a correlation which cannot simply be explained as the result of size-sorting in a fluvial setting. Therefore this correlation is likely to, at least in part, be the product of real behavioural use and discard patterns of the Olorgesailie hominins. Additionally a side test run on the typological data from Olduvai Beds III and IV showed a similar correlation between the proportions of bifaces and scrapers, alluding to a more wide-spread pattern of typological discard by Acheulean hominins.
The Unexplored Kalahari – an Early Stone Age site at Seo Pan, Southern Botswana

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This is a preliminary report of work in progress.

In 2014 and 2015 a small international team working with the Museum of Botswana surveyed rock outcrops in the Tsabong area of the southern Kalahari. 15 localities yielded surface Palaeolithic artefacts of which Seo Pan had the greatest concentration, extending across approximately 200 x 50 metres. The site lies on the edge of a small pan with a prominent outcrop of quartzitic sandstone in the centre of the artefact scatter, which was the lithic resource for artefacts.

Initial excavation here in 2015 revealed an occupation site rich in handaxes, cores and flakes. Slight evidence of MSA material is also present. Extrapolation from a 10 x 10 metre grid, within which four metre square pits were dug, suggests about ¼ million artefacts may be present at the site. Sand matrix samples for OSL dating were taken (there is no ‘soil’) and artefacts were processed for Edge Testing – a digital program that measures the loss of section mass from artefact edges as a proxy for relative dating within a site.

Seo Pan is already throwing up anomalies – the artefact scatter lies across, not with, the contour beside the pan; the density of subsurface artefacts is much greater than on the surface in one area, but not in others, their configuration suggests they have not moved far since deposition.

Palaeolithic occupation in the Kalahari is hard to detect because of masking by sand or calcrite; Seo Pan offers a rare opportunity to excavate a rich site. Our survey opens up the possibility that in late ESA and early MSA time a previously undetected lattice of occupation sites spread across the Kalahari environment. Further detailed exploration of this region is obviously needed.
The Ebbsfleet Elephant: Lithic Technology, Elephant Exploitation and the Lower/Middle Palaeolithic Settlement of Europe

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Located in the Lower Thames basin, to the southeast of London, the “Ebbsfleet Elephant” is a British MIS 11 (Hoxnian) Palaeoloxodon antiquus site, discovered in 2004 at Southfleet Road in the Ebbsfleet Valley (Kent) during construction of the new High Speed train line between London and the Channel Tunnel (Wenban-Smith et al. 2006). Analysis and publication having recently been completed (Wenban-Smith 2013), it is now possible to report the full results of the project. The site provides clear evidence of undisturbed hominin activity around one elephant carcass, together with lithic and faunal remains from the wider surrounding area and rich palaeo-environmental remains indicating the contemporary interglacial climate and local environment. The lithic material culture associated with the elephant horizon is dominated by flake production and simple flake-tools. This gives way higher up the stratigraphic sequence to a handaxe-dominated technological tradition, confirming previous indications — in particular from the sites of Swanscombe and Barnham — of a major lithic technological transition within the Hoxnian in Britain. Two main explanations can be presented for this: (1) in situ development of technological change, following an initial post-MIS 12 settlement from the European continent of hominin groups with a flake-core industrial tradition, or (2) a second wave of British settlement by continental groups with a different, handaxe-based technological tradition. These competing explanations have a long history in Lower/Middle Palaeolithic discourse, going back to Breuil (1926), and tied in with various assumptions on the nature of hominin society and the behaviour/cognitive foundations of lithic production. Thus this problem is not merely of parochial British interest, but ties in with both general approaches to lithic interpretation, and also our understanding of the Lower/Middle Palaeolithic occupation of northwest and central-northern Europe. Some new perspectives are brought to bear based on analysis of the organisation of lithic production at the Southfleet Road site. These suggest that, despite the apparent contrast in lithic approaches, there are key shared elements that support a notion of in situ development as opposed to a second wave of migration. Besides these wider issues of technological/typological interpretation, the lithic assemblage from beside the elephant reflects on-the-spot tool manufacture, presumably for butchery of meat and other edible parts. It is suggested that elephant (and other megafaunal) exploitation may have been an important aspect of successful hominin adaptation facilitating northward range-expansion, and that the Ebbsfleet elephant may well have been hunted.

In the Schöningen open-cast mine (Lower Saxony, Germany) Lower Palaeolithic sites have been discovered within an extensive Pleistocene glacial-interglacial sequence, extending from the Elsterian glaciation to the present. The Schöningen sites – among which the famous “Spear Horizon” Schöningen 13 II-4, where wooden spears were found within a rich context of mammalian remains and lithic artefacts – are highly relevant for understanding hominid behaviour and subsistence strategies.

The sequence exposed at Schöningen plays an important role in Middle Pleistocene chronostratigraphy. Despite extensive research, there is ongoing debate on the position of the Middle Pleistocene deposits, and – as a consequence – on the age estimate of the Palaeolithic sites. This research explores this debate, which relates to a) the interpretation of the stratigraphic sequence exposed at Schöningen, (b) the age of the Holsteinian Interglacial and its correlation with the marine isotope record, and (c) the number of interglacials between the Elsterian and the Saalian glaciations. The aim of this report is to contribute to the development of a reliable chronostratigraphic framework for the Palaeolithic archaeology from Schöningen, and to the development of a framework for the Middle Pleistocene in general. Three different models are proposed in the literature (Kuijjer, 2014). In the models, the oldest Palaeolithic find horizon in the open-cast mine (Schöningen 13 I) is assigned to the Holsteinian Interglacial, which is correlated with either MIS 13, MIS 11 or MIS 9. The “Spear Horizon” is either assigned to a stadial-interstadial phase following the Reinsdorf Interglacial or the Holsteinian Interglacial, and correlated with MIS 11 or 9. Interregional correlation of new biostratigraphic evidence (e.g. van Kolfschoten, 2012, 2014), indicates an age estimate of around 300ka (MIS 9) for the spear horizon (Schöningen 13 II-4), and an age estimate of around 400ka (MIS 11) for the oldest archaeological site from the open-cast mine (Schöningen 13 I).

Intraspecific Variation in the Supraorbital Torus of Homo heidelbergensis sensu lato

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The taxonomic status of Homo heidelbergensis sensu lato is highly debated, with some arguing that this group contains more variation than can reasonably be contained within one species. This study aimed to assess the variation within the supraorbital region in H. heidelbergensis specimens, in an attempt to shed light on their taxonomic status and relationship to later Pleistocene hominins. 3D geometric morphometric methods were used to create a grid of 350 semilandmarks, anchored by seven landmarks, across the browridge. This grid was placed onto surface models of 203 specimens, including: six H. heidelbergensis s.l. from Europe and Africa; a group of 100 Homo sapiens with temporal and geographic diversity; seven Homo neanderthalensis; 30 Pan paniscus; 30 Pan troglodytes troglodytes; and 30 Pan troglodytes schweinfurthii. Generalised Procrustes Analysis and Principal Component Analysis were used to place semilandmark configurations within the same shape space, and analyse the principal components of variance in tangent space.

Results showed that the first two principal components (PCs) accounted for 40.7% of the total sample variation, with over 90% of variation being explained by the first 20 PCs. Shape changes associated with PCs 1 and 2 related to depth of post-toral sulcus, degree of post-orbital constriction, and anterior and superior projection of the supraorbital tori and glabellar region. Procrustes distances were calculated, and variation was analysed through comparisons of the coefficient of variation of these distances within the respective taxa. It was found that the H. heidelbergensis s.l. group had comparable if not smaller variation to H. sapiens, and subgroups within H. sapiens, as well as to non-human ape species and subspecies groups. It was therefore concluded that the range of craniofacial variation in the supraorbital region for H. heidelbergensis s.l. falls within the boundaries for a single mono- or polytypic hominoid species.
A Pilot Study of MSA Obsidian Sources from Kilombe (site MSA 200) Using PXRF 120,000 Ka

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The new Middle Stone Age locality of Kilombe GqJh3 West 200 lies approximately 2 km west of the main Achulean site of Kilombe. The site, which was first excavated in 2012, comprises a large surface collection of long obsidian points and a number of in situ MSA obsidian flake tools the latter of which lie directly below a primary tuff currently dated by 40Ar/39Ar to 120,000 Ka. This poster presents the preliminary results of a small pilot study (15 artefacts) using portable XRF (niton gold 3) to determine the source and transport distances of the raw materials present in this assemblage.

PXRF has proven a useful tool in determining sources of obsidian on archaeological sites based on the use of the trace elements Rb, Zn, Sr, Y, Zr, and Nb, providing the limits of detection are calculated and issues of cross comparison between different instruments using different calibration methods are considered when comparing to published data. Preliminary results here suggest a South Naivasha source for part of the surface collection and one in situ flake tool. Other sources are apparent within this data set but are more difficult to determine using the PXRF method. These data may suggest the long distance transportation of obsidian over 100 km away from Naivasha to Kilombe ca. 120,000 Ka and further show the limitations of PXRF when sourcing Kenya type obsidians.
Investigating Neanderthal Subsistence at La Cotte de St. Brelade, Jersey

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In North-Western Europe bone preservation is usually poor in Middle Palaeolithic localities and long stratigraphic sequences are rare. The archaeological sequence of La Cotte de St. Brelade (Jersey), known for both abundant lithic and faunal material recording human activity and environmental conditions over the last 200,000 years, is an exception in this region. Here we present the results of a taphonomical and zooarchaeological investigation of the bone material from ten Saalian units in La Cotte. The results of this new analysis allow for a deeper understanding of the process of formation and modification of the different faunal assemblages from the site.

Throughout the sequence, the fauna is clearly dominated by large- and mega- herbivores, while similarly to other sites from Northern France, carnivore presence is extremely limited and even absent in some layers of La Cotte. If diagenesis has unevenly affected the faunal material, human inflicted damage such as typical cut marks or intentional bone breakages are present in all layers, attesting to the consumption and processing of different species, notably cervids, large bovids, rhinoceros and mammoths. Our results point toward an anthropogenic origin of the faunal assemblages from the different Saalian layers of the site, including the famous concentrations of megafaunal remains (the so-called ‘bone heaps’). Neandertals seem to have preferentially and repeatedly targeted large and very large (i.e. megafauna) herbivores that they have processed and likely consumed on the site. The treatment of the carcasses is different, however, depending on the layers and suggests that different activities took place here and/or different lengths of occupation. With other evidences from Northern France and England, La Cotte contributes to a better understanding of the diversity of the subsistence strategies developed by Neanderthals in North-Western Europe during the Middle Pleistocene.
Reanimating the La Cotte de St. Brelade ‘Bone Heaps’: Reconstructing Complex Early Neanderthal Responses to Environmental Change

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La Cotte de St. Brelade provides the key sequence for recording long term human occupation and climate change in North West Europe from MIS 7 through to at least MIS 3. The combined collection of over a quarter of a million stone tools from ten stratigraphic units forms the largest database of Neanderthal activity from a single site in the region. Alongside the stone tools, mammalian faunal remains were recovered, including two ‘bone heaps’ comprising elements of mega-fauna dominated by mammoth and woolly rhinoceros, seemingly arranged in a structured manner [1] [2]. Yet despite the central importance of these lithic assemblages, their relationship with these remarkable faunal assemblages has never previously been investigated.

Here we report on the first detailed taphonomic and technological study of complete lithic assemblages from the ‘bone heap’ layers (5 and 3/top A). We demonstrate that, rather than reflecting a single, repeated behaviour (a game drive; Scott 1980), the two bone heaps reflect distinct archaeological signatures. These two accumulations are associated with artefact assemblages reflecting changing technological repertoires, differing strategies for raw material provisioning relatable to changing sea level, and varied levels of site residency and group mobility (as illustrated by stone tool lithologies, refitting studies and the movement of artefacts into and through the site). This extended and structured use of landscape and place forms part of repeated signature at the site during MIS 7/6 and a wider emergent behavioural pattern that develops in Europe during the late Middle Pleistocene.

Neandertals and Hyaenas Coexisting: Spatial and Archaeological Analyses in the Meuse Valley (Belgium) During the MIS 3

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Human groups and hyaenas (Crocuta crocuta spelaea) intensively occupied European territories during all the Marine Isotopic Stage 3, living sympatrically. The last findings in isotopic analyses permitted to infer data on their specific diet and find out that even if they shared a priori the same ecological niche in the Meuse Valley, the preys selected by the two predators were different to some extent. Through a complete bibliographical synthesis led in the light of a faunal study of new archaeological and palaeontological sites, this poster aims to contextualize these data and offers an updated overview of the territorial occupation by hyaenas and humans in this region. The study of carnivore damages and anthropogenic impacts on several osseous assemblages combined to a spatial analysis of all the sites in the Meuse valley confirm that the ecological niches of humans and hyaneas are indeed slightly different, but however highlight a clear and interesting overlap. These similarities and discrepancies are discussed here in order to enlarge our knowledge of their interspecific interactions and to understand the modalities of their coexistence.
Redating Nelson Bay Cave and Byneskranskop 1, South Africa

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The Southern African Later Stone Age (LSA) is characterised by a well-defined succession of lithic industries, which appear to occur more or less simultaneously across the sub-continent. This sequence was in large part first recognised and defined by the lithic changes observed in several sites along the Southern Cape coast, including Nelson Bay Cave, Boomplaas, Kangkara, Melkhoutboom, and Byneskranskop 1. Yet none of these sites is dated comprehensively enough or with sufficient precision to test the widely accepted southern African chronology in this region. Given the marked environmental gradients and vast area over which similar LSA industries are found, their apparent near-synchrony across the subcontinent warrants close investigation. Here we present fourteen new AMS radiocarbon measurements from Nelson Bay Cave and twelve from Byneskranskop 1, spanning the entire LSA sequence at these sites. We explore the impact of these new dates on the chronologies of the two sites using Bayesian modelling approaches, and briefly discuss the implications for regional understandings of technological change. This study demonstrates the enormous potential of new radiocarbon dating applications in southern Africa.
Liquid Chromatography as Alternative Purification Technique for AMS Dating of Contaminated and Low Collagen Bone Samples

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The efficient removal of carbon-based contaminants from samples prior to AMS dating is one of the most important steps in the reliable application of the radiocarbon method. This is particularly relevant for Palaeolithic samples as any small amount of contamination by carbon containing compounds can significantly affect the dating and prevent robust chronologies to be established. Since 2001, members of the Oxford Radiocarbon Accelerator Unit (ORAU) have been applying ultrafiltration to remove low molecular weight contamination in preparation for dating bone. It was first applied to material from the British Palaeolithic (~2000–2005) and later to the western European Palaeolithic (2006–2009) sites. Since, the efficiency of ultrafiltration to remove contamination and therefore improve the precision of the dating has been demonstrated on a broad range of samples. However, in some cases, the ultrafiltration is not efficient enough to fully remove contamination and the additional steps that include ultrafiltration can be problematic for low collagen samples. These limitations are particularly relevant for dating the Palaeolithic period because Pleistocene material contains much greater quantities and types of contaminants and the organic matter we use for dating is often significantly degraded. Over the last five years, the ORAU started to use liquid chromatography to separate the amino acids obtained after hydrolysis of collagen samples [1-3]. This has proven to be a very efficient technique to remove contaminants from collagen samples even for poorly preserved bones. This poster presents, with some chosen examples, the efficiency of the technique to eliminate contaminants. It also presents the importance of using liquid chromatography for samples with very low collagen preservation where the standard procedure would not allow for the production of enough graphite for the AMS dating.


Evaluating the Use of Chronologies in the Study of Hominin Occupation in Palaeolithic Europe

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The cause of Neanderthal extinction is still a contentious issue: the end of their European occupation overlaps temporally and spatially with the arrival of anatomically modern humans (AMH), implying a direct link, though some now believe an extended period of climatic variability was to blame for their decline. The study Neanderthal extinction requires a secure chronology of hominin occupation in order to compare the patterns of movement of AMH and Neanderthals to one another and to an environmental or climatic proxy. The accuracy of this is confounded by multiple factors: dating techniques and calibration, the use of lithic industries as an occupation proxy for a particular species, and the suitability of palaeoclimatic proxies.

Via a case study of hominin occupation in southwest Europe, this project investigated what progress can be made using existing data: whether this can be used to draw any meaningful conclusions, and where the strengths and weaknesses lie within the methods and data used. The case study used dates from multiple sources across 76 sites in south-west Europe (here excluding central and southern Iberia) to investigate correlations between Neanderthal and AMH occupations, shifts in technology, and changes in climate.

The results were used to produce recommendations for future studies of this type, and to evaluate the utility of the existing data. The findings highlight the need for investigation at local scales (especially in terms of palaeoenvironmental study), interdisciplinary cooperation, and the continued re-dating of archaeological sites using updated methods, as well as the importance of careful assessments of site taphonomy in order to produce accurate chronologies.
Bridging Distances or Wandering About? The Raw Material Procurement Organization of Early Upper Palaeolithic Humans in the Banat (SW-Romania)

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Global dispersal of anatomically modern humans has always been a heavily-researched and -debated topic of prehistoric archaeology. However, it is solely after establishing the complex interplay of socio-cultural and ecological factors at the level of the individual archaeological localities, that it becomes possible to gain understanding concerning past human behaviour and to tackle questions about our migratory past.

The here-presented doctoral research of the Collaborative Research Centre 806 Our Way to Europe | Culture-Environment Interaction and Human Mobility in the Late Quaternary intends to arrive to such an understanding for the Banat region in South-western Romania during the early Upper Palaeolithic. A significant aspect in the assessment of past human behaviour is the distance prehistoric people were willing to bridge to procure the rocks they needed to produce lithic artefacts. Being able to pinpoint the provenance areas already reveals a great deal about the nature of human mobility. A profound understanding of the raw materials is hence paramount in this regard.

Currently, the raw material signature of the early Upper Palaeolithic localities of the Banat region is twofold. On the one hand, archaeological assemblages are dominated by a SiO2-variety that relates to former local episodes of volcanism and hydrothermal activity. Since remnants of cortex attest of natural exposure prior to reduction, an expedient procurement strategy is inferred. On the other hand, a number of raw materials, among which a blackish SiO2-variety, could originate from larger distances, as their geological sources are not known in the region. More detailed analysis – chemically and microscopically – of these possible exotics has to provide closure on whether the early modern humans of the Banat went out of their way to get their raw materials – socially or physically – or just strolled around the area looking for suitable rocks to knap.
Long Distance Movements for High Quality Lithic Raw Material in the Swabian Aurignacian. Vogelherd Cave as a Case Study

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One of the case studies of a small workgroup in the CRC 1070 ResourceCultures at the University of Tuebingen is located in the Swabian Jura. The main site is the cave site Vogelherd north to Heidenheim with an occupation from the Middle Paleolithic to the Neolithic. The old excavation took place in 1931 by Gustav Riek. But the back dirt excavation and the after works lasted about 9 years and are finished by now (e.g. Riek 1934, Conard et al. 2013).

Unravelling the Aurignacian occupation presented in two layers (IV, V), the quantity of local and regional procured lithic raw materials is quite high. But the impact of exotic raw material of a higher quality is even bigger. The question of "why and where from" is one part of this presentation. The other one is the comparison to other case studies in the European Aurignacian. Also the techno-functional analysis of the tools and the function of the site itself can help to explain this feature of long distance movements. Conard, N.J. et al. 2013. Die letzte Kampagne der Nachgrabungen am Vogelherd. Archäologische Ausgrabungen Baden-Württemberg 2012. pp. 84-88. Riek, G. 1934. Die Eiszeitjägerstation am Vogelherd im Lonetal 1.


Paleogene Freshwater Silex as an Indicator for Long Distance Movements of Prehistoric Human Groups. A Case Study in Southern Burgundy

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Analyzing the procurement strategies of lithic raw materials from both the late Neanderthals and the early Anatomical modern humans is the subject of a small workgroup in the CRC 1070 ResourceCultures at the University of Tuebingen. One of the case studies is located in the Côte Chalonnaise in Southern Burgundy. Many open air and cave sites are located in this area, surrounding the two main sites Grottes de la Verpillière I & II near Germolles.

The aim of the research is a better understanding of the strategies of how and where the prehistoric human groups got their lithic raw materials and weather there are differences between the two hominids or not. As usual many local and regional raw materials had been used by both of them. But to determine long distance movements the Paleogene lacustrine or freshwater silex can help. Paleogene (lately named Tertiary) silex is often bound to single outcrops and has a distinguish habit. In old collections and in the new excavations or surveys a couple of artefacts knapped from freshwater silex could be documented. The results of the analyses and the re-construction of possible movements shall be presented here.
Mobility and Subsistence Strategies Among Ursus spelaeus and H. sapiens During the Early Upper Palaeolithic in the NW of the Iberian Peninsula: the Cova Eiros Cave

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Human–carnivores interaction during the Palaeolithic represent one of the most popular topics in archaeological research. Competition between both predators for the same ecological resources and areas could imply: 1) an alternating occupation of the same habitat, 2) a co-occurrence pattern or 3) an alternating occupation with episodic co-occurrence. The cave of Cova Eiros is a very important site for paleontological research because of the abundance of Ursus spelaeus fossil remains. The cave is located in the NW of the Iberian Peninsula, in the Galicia region. This is one of the most important palaeolithic Galician sites because of the stratigraphical context and the preservation of faunal remains (Galician acid soils difficult the preservation of organic materials). Cova Eiros archaeological level 2 is dated to the early Upper Palaeolithic (31.690+-240 AMS C14). Taphonomy and zooarchaeology permit us to recognize the seasonal mobility pattern and the subsistence strategies of bears and humans, and the type and/or the degree of interaction, if any. Inferring the human mobility strategies was made possible by studying bear age-profile. The interpretation of bear’s ecological behaviour leads us to hypothesize about the subsistence strategies of both bears and humans groups: 1) time of residence inside the cave, 2) seasonal mobility patterns and 3) alternance/co-occurrence occupation. Taphonomic studies have shown too some interesting results about human subsistence strategies; cutmarks and percussion marks were found on large carnivore remains (particularly on Panthera pardus and Ursus spelaeus bones).
The Earliest Ceramics: Interregional Comparisons and Implications for the Study of Non-Traditional Palaeolithic Material Culture and Technologies

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This poster presents and compares the records of the world’s earliest ceramic technologies, which were used to make figurative “art” rather than functional vessels. Two key regions and periods will be the focus of our discussion: Gravettian Czech Republic [1] and Epigravettian Croatia [2]. We consider the origins of this innovative material in both areas. In Gravettian Czech Republic, ceramic materials were used to make figurines at a cluster of broadly contemporaneous, large, open-air, “Pavlovian” sites, including Dolni Vestonice I and Pavlov I, which are dated to between 31-27 kya. In Croatia, ceramic figurines were found in several archaeological horizons at a single cave site, Vela Spila, with dates between 17.5-15 kya. Comparing the records from these two regions, we will consider if there is any evidence of continuity or if the archaeological records suggest independent invention in both regions. Subsequently, we will discuss and compare the impact of this new ceramic material on representational traditions and styles in both regions, with special consideration of the broader socio-technical transformations that may be linked to the introduction of ceramics. We will examine the limitations of familiar approaches to the study of Palaeolithic imagery, which tend to privilege iconographic and stylistic characteristics of representational art. The ceramic figurines demonstrate the social importance of Palaeolithic “art” beyond the most iconic “Venus” figurines and animal statuettes; the large and diverse oeuvre of less iconographically striking ceramic “art” offers important insight into the social role of art-making in diverse Palaeolithic contexts.

Additionally, this poster explores the potential of building and applying integrated and contextualised chaines opératoires-based methodologies to study Palaeolithic art [3-5]. The results from our research demonstrate that these kinds of methodologies offer robust and rewarding ways of engaging with this challenging dataset. Furthermore, Palaeolithic ceramic are a valuable case study in the importance of studying non-lithic and non-osseous Palaeolithic material culture. Our results provide a robust foundation for exploring and discussing some of the biases and limitations of past research that has often focused on the stone and bone artefacts, which survive in greater number in most contexts.
To Haft and to Hold: Evidence for the Hafting of Clovis Fluted Points

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Clovis fluted points vary considerably in technology and morphology, but also share a set of attributes, the most diagnostic of which are the flute scars, the remnants of the flake removals from the basal region that travelled up towards the tip. Fluting on Clovis and Clovis-like points generally extends no further than a third of the way up the face of the point. Finished points are usually ground smooth along the base and lower edges, suggesting facilitation of the hafting (attachment) to a wooden shaft or handle by way of an ivory or bone socket. The points may have been hafted directly to a mainshaft and used as a thrusting spear during close encounter attacks, or in the hand as knife or butchery tool. Alternatively, an intermediary shaft, or foreshaft may have been used to secure the point. The suggestion of foreshafts being used by Clovis hunters received support after the discovery of bone rods in association with mammoth remains and Clovis points at the type site at Blackwater Draw, New Mexico in 1936. Several other Clovis-aged sites across North America have yielded ivory and bevelled rods that have also been associated with foreshafts and the hafting of Clovis points. Scratches that are present on a couple of Clovis points made on varieties of obsidian, have been identified as being “hafting abrasion” evidence, this roughening of the surface would have helped in securing the point into the shaft or socket. In one example from the Hoyt site in Oregon, remains of a “mastic” or hafting glue was found discovered in the hafting abrasions. This presentation will look at the evidence for Clovis hafting, the various sites where the evidence is present and as part of my current thesis research, whether the hafting of Clovis and Clovis-like fluted points affects the point’s morphology.
UP-NORTH: Colonisation and Cultural Diversification in Northern Europe During the Pleistocene-Holocene Transition

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UP-NORTH explores the relationship between climate change and human behaviour during the Late-glacial in northern Europe. The project focuses on the recolonisation of previously abandoned northern landscapes by the late Upper Palaeolithic populations, and the subsequent cultural diversifications that took place against a backdrop of rapid climate change and instability. Using a range of techniques applied to the archaeological record UP-NORTH aims to explore whether the process(es) of recolonisation and the increasing diversification seen in the lithic and bone industries during this time period represent responses to changing environments and resources, or if such changes were independent of one another. To address this question the project aims to develop an integrated chronological, palaeoclimatic and palaeoecological framework to explore changing landscapes, and human activity within them. A key aspect of the project is to assess the timing, pace and scales of change at a local level, and to evaluate whether these changes varied by, or were consistent between, locations. Here, we present an overview of UP-NORTH, providing information on the spatial and temporal focus of the project and outlining the methodological approaches (stable isotope, radiocarbon dating and ancient DNA analysis). By developing multiple integrated lines of evidence the project provides an insight into the Late-glacial landscape and environment change that Palaeolithic people experienced and evaluates how these may have influenced the decisions they made, related to technological developments, changes in hunting strategies, mobility and landscape use.
A Greener Model of Palaeoenvironments in the Eastern Levant

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Given the inhospitality of the region today, the arid steppe-deserts of the eastern Levant supported a surprisingly thriving forager population in prehistory. Palaeoecological research has demonstrated that this occupation was underpinned by significantly ‘greener’ conditions during the Pleistocene. However, while this has yielded detailed reconstructions of plant and animal communities at particular locales, the wider, regional picture remains elusive. This poster presents an alternative, ‘top down’ model of regional palaeoenvironments based on hydrology, weather patterns and published palaeoclimatic data. The output of the model is validated against satellite measurements of vegetation density, and compared with Epipalaeolithic and early Neolithic site distributions. The method could be further applied to predicting activity in this and other arid environments, and/or used as a basis for more detailed models of plant, animal and human palaeoecology.
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