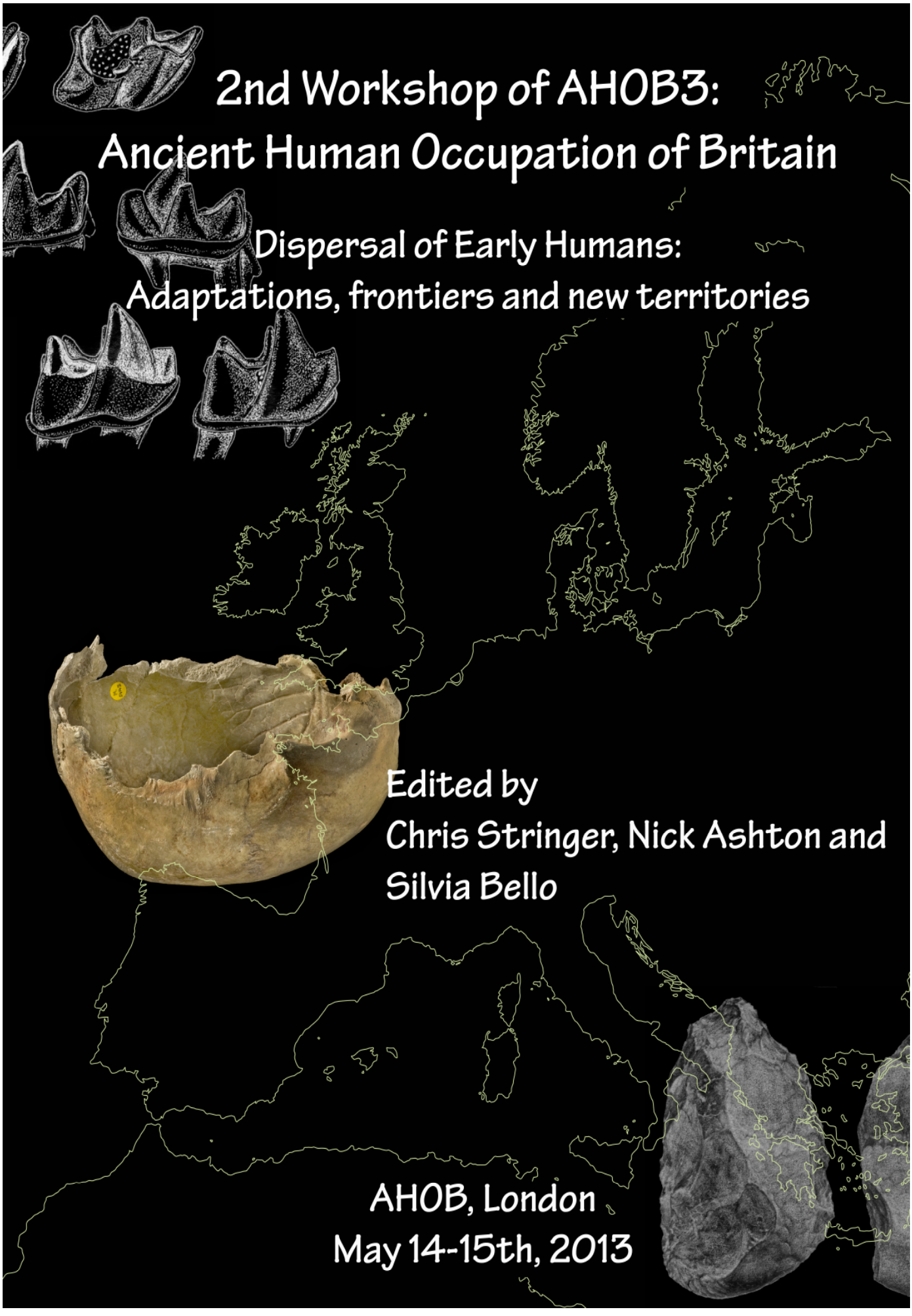

2nd Workshop of AHOB3: Ancient Human Occupation of Britain

Dispersal of Early Humans: Adaptations, frontiers and new territories

Edited by
Chris Stringer, Nick Ashton and
Silvia Bello

AHOB, London
May 14-15th, 2013

Second Workshop of AHOB3
(Ancient Human Occupation of Britain)

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AHOB wishes to acknowledge the Leverhulme Trust for its generous support of the projects

2nd AHOB3 Workshop

Queen Mary University of London, Geography Room 126

May 14-15th, 2013

Tuesday 14th May

10:30	A preliminary report on recent geological fieldwork at Happisburgh, Norfolk	Simon Lewis and Peter G. Hoare
11:00	Recent Geophysics work at Happisburgh Site 1 and Site 3	Martin Bates and Richard Bates
11:30	***Coffee***	
12:00	The offshore Palaeolithic Landscapes at Happisburgh, North Norfolk	Justin Dix et al.
12:30	Latest results from Happisburgh Site 1 (Norfolk, UK)	Mike Field
13:00	***Lunch***	
14:00	New field work at Warren Hill, Mildenhall, and further consideration of the Bytham River hypothesis	Simon Lewis et al.
14:30	Palaeoclimatic characterisation of early human environments in southern Spain	Sila Pla-Pueyo et al.
15:00	Interglacial diversity over the past 800,000 yrs: Local, regional and global variability and the implications for the early Human occupation of Europe	Ian Candy
15:30	***Tea break***	

16:00	Quantitative palaeoclimate reconstruction of MIS9 interglacial deposits in SE England by multi-proxy consensus	Dave Horne
16:30	A high-resolution multi-proxy palaeoenvironmental record from Wing, Rutland, UK	Peter G. Hoare et al.
17:00	The Pontnewydd Human Remains	Tim Compton and Chris Stringer

19:30 **Dinner at Muhib Indian Restaurant, 73 Brick Lane**

Wednesday 15th May

10:00	Palaeolithic spatial distributions and demography	Nick Ashton and Simon Lewis
10:30	Missing cat	Simon Parfitt
11:00	***Coffee***	
11:30	Reconstructing the Late Middle and Upper Pleistocene sequence at La Cotte de St. Brelade, Jersey: 200,000 years of human presence and absence	Andy Shaw et al.
12:00	Recent investigations in the western ravine at La Cotte de Saint Brelade, Jersey: dating and palaeoenvironments	Martin Bates et al.
12:30	New Views on the MIS 6 Neanderthal Occupation Sequence at La Cotte de St Brelade, Jersey.	Beccy Scott et al.
13:00	***Lunch***	
14:00	Human populations in Eurasia during the late Pleistocene	Chris Stringer
14:30	Some comments on the age of KC4	Rob Dinnis
15:00	***Tea break***	
15:30	The Lateglacial faunal assemblage from Gully Cave, Ebbor Gorge, Somerset: chronology, taphonomy and palaeoenvironmental change	Danielle Schreve
16:00	Upper Palaeolithic ritualistic cannibalism: Gough's Cave (Somerset, UK) from head to toe.	Silvia M. Bello et al.
16:30	**Discussion and Meeting close**	

Abstracts

As these abstracts may contain unpublished data,
please check with the authors before quoting

Palaeolithic spatial distributions and demography

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Newly digitised British Museum (BM) records of sites and artefact types for the British Lower and Middle Palaeolithic are now enabling a more detailed examination of the distribution of sites. This initial study makes a comparison between the spatial distributions of handaxe sites (Lower Palaeolithic) with those that contain Levallois archaeology (Early Middle Palaeolithic). Potential regional biases in the BM collections are assessed by reference to Roe's 1968 Gazetteer, which suggests that the BM collections are broadly representative of Britain as a whole.

Using just the BM collections, as would be expected both handaxe and Levallois sites are concentrated in the flint-rich areas of southern and eastern England. However there are notable differences between the distributions of the two artefact types; handaxe sites have a broader spread of across these regions, whereas Levallois sites are heavily concentrated in Kent and London.

The study concludes by exploring three possible ways by which the pattern can be explained: 1. Biases in collection history; 2. Regional differences in access to underlying geology; and 3. Differences in the distribution of Lower and Early Middle Palaeolithic human populations.

References:

Roe, D.A. 1968. *A gazeteer of British Lower and Middle Palaeolithic sites*. Council for British Archaeology.

Recent Geophysics work at Happisburgh Site 1 and Site 3.

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As part of the Happisburgh-Pakefield Palaeolithic project an on shore geophysical survey was conducted at Happisburgh, Norfolk in order to test the hypothesis that buried channel sequences cut in Crag and buried beneath modern beach or till deposits could be mapped using remote sensing methods. Particular attention was focused on attempting to provide a seamless model from low tide to inland across the variable sequences sealing the channels as well as providing targets for tracing into the shallow marine zone.

Three techniques were tested along the beach and cliff sections to the north and south of Happisburgh, namely electromagnetic ground conductivity mapping, direct current resistivity imaging and ground penetrating radar. The results of the EM and DC imaging showed features that correspond with the known location of channels and it is likely that these methods could be used across a wider area for mapping the buried channel network inland beneath the till cover. The GPR did not show any significant penetration of the Crag and till deposits. The on shore geophysics was correlated closely to offshore geophysical results.

Recent investigations in the western ravine at La Cotte De Saint Brelade, Jersey: dating and palaeoenvironments.

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Although excavation has occurred sporadically for at least 100 years, understanding of this site is patchy and imperfect and this is particularly true of the Western Ravine in which the Neanderthal remains were recovered. However, recent work in 2010/2011 ascertained that a significant body of sediment is still preserved at the site that could potentially shed light on these remains.

The sediments examined in the recent work lie within the Western Ravine, an area of the site that is poorly understood and contains sediments that have been only partially examined in the past. This part of the sequence is undergoing rapid erosion and because these sediments were deemed at high risk of collapse the National Environment Research Council (NERC) awarded an Urgency Grant to undertake a process of sampling and stabilisation of the at risk sediments. This work represents the first formal investigation of the site since the early 1980s and the first conservation measure since work in the North Ravine at the end of McBurney's 1960s–1970s excavations. It also represents the first modern attempt to provide a dated framework for parts of the site most closely associated with the Neanderthal remains.

The investigation documented the sedimentary context of the sequence and for the first time applied a systematic approach to the dating of sediments at La Cotte. Site formation processes are complex, and are dominated by movement of local geological materials including granite and granitic weathering products downslope. However, input of sea bird guano and regular but episodic loess deposition was also noted. Bioturbation by small invertebrate mesofauna and burrowing by larger fauna, weathering of the guano and recent rooting was also noted.

A sequence of 12 Optically Stimulated Luminescence dates were taken and for the first time an integrated set of age estimates are available for the site. These dates indicate correlation of parts of the Western Ravine sequence with the early and middle Weichselian (MIS 3-4).

A limited number of artefacts were also collected during site works. The review of archive data from previous excavations has enabled an integration of the new results with those of previous excavations and suggest that the Neanderthal remains in the Western Ravine may belong to a late phase in Neanderthal occupation.

Upper Palaeolithic ritualistic cannibalism: Gough's Cave (Somerset, UK) from head to toe.

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Evidence of prehistoric 'ritualistic cannibalism' is difficult to prove. Firstly, the exploitation of the human body for nutritional purposes needs to be demonstrated through osteological analyses, specifically the presence of cut-marks, percussion damage and human tooth-marks. Secondly, even when the modifications on human remains have been shown to be related to cannibalism, the practice may not necessarily represent ritualistic behaviour, but rather the result of exceptional circumstances (e.g. survival during periods of starvation).

This talk presents a recent re-analysis of the Magdalenian human remains from Gough's Cave (Somerset, England, 14,700 cal BP). Detailed analysis for cranial remains has been presented by Bello et al. (2011) and therefore, only the modifications observed on the post-cranium will be described here. We will discuss, however, the complete set of modifications observed on the human remains.

The human skeletal sample from Gough's Cave was exclusively accumulated and manipulated by humans. The rarity of modifications associated with carnivore activity, post-depositional processes or trampling implies an anthropic accumulation. The location of cut-marks can be associated with the detachment of the head, disarticulation of the vertebral columns, dismemberment of the torso and limbs. The distribution of slicing and filleting marks on the post-cranial remains indicates removal of the skin and major muscles of the body. The fragmentation pattern of long bones, characterised by the absence of epiphyses from either end and the fracturing lengthwise of the shaft, can be related to a process of hammering of the bones for extraction of bone marrow. Finally, the overall pattern and distribution of human chewing marks can convincingly be attributed to anthropogenic consumption (Cáceres et al., 2007; Saladié et al., 2013).

Conversely, the processing of the head involved the meticulous removal of all soft tissues and controlled percussion, not necessarily followed by consumption.

Percussion marks on the neuro-cranium were inflicted in discrete clusters and their location approximates a sub-horizontal plane. This damage was also associated with flaking and chipping of the edges to straighten the rim and make it more regular. The full pattern of modifications observed for the cranial remains and completeness of the vaults imply that the skulls were scrupulously prepared or 'cleaned' using flint tools and subsequently broken and shaped to produce skull-cups (Bello et al., 2011).

It is, however, the human chewing pattern that mainly distinguishes the differential treatment of the head and torso of human bodies at Gough's Cave. More than half of the post-cranial fragments have signs of human chewing, while these are completely absent on the skull and mandible. This absence suggests that the modifications observed for the cranial remains can be attributed to a process different from the extraction of nutrients and that it rather relates to a ritualistic behaviour. We suggest that the combination of these two types of treatment (nutritional for the post-cranium and ritualistic for the cranium) unequivocally demonstrate the occurrence of cannibalism as part of a ritualistic practice within this population.

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Interglacial diversity over the past 800,000 yrs: Local, regional and global variability and the implications for the early Human occupation of Europe

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The magnitude and impacts of the glacial and interglacial cycles that characterise the Quaternary Period have a clear importance for the understanding of early human evolution and migration. The climatic background of early human occupation in Europe is dominated by the mid-Brunhes Event (MBE), a shift in the magnitude of interglacial warmth, and glacial cooling, that occurred between MIS 13 (ca 500,000 yrs BP) and MIS 11 (ca 410,000 yrs BP). In records such as EPICA and LR04 the interglacial/glacial cycles of the early Middle Pleistocene, MIS 19 to 13, are relatively subdued with all interglacials being significantly cooler than the Holocene and all glacials, with the exception of MIS 16, being relatively mild in comparison to MIS 2 or 12. Research undertaken as part of the AHOB project has shown that this is not the case in Britain, where many interglacials within the "Cromerian Complex", the early Middle Pleistocene of Britain, record evidence for some of the warmest climates of the past 800,000 years. In this presentation, rather than thinking purely of the British or Antarctic record, I am going to review evidence for the MBE in a regional context (the North Atlantic and Nordic Seas) before considering patterns of its expression across the globe. The key findings of this work are that: 1) there is no evidence for the MBE in tropical low-latitudes, 2) there is a clear expression of the MBE in the Arctic/Antarctic high-latitudes, and 3) there is a variable expression of the MBE in the mid-latitude regions (such as the North Atlantic).

This pattern of interglacial diversity means that during the early Middle Pleistocene, interglacial climates were dominated by much stronger latitudinal temperature gradients. For example, during MIS 13, the tropics were as warm as during MIS 11 to 1 but the high latitudes were significantly cooler than during MIS 11 to 1, then much stronger poleward temperature gradients would have existed during this time interval. This can be clearly seen in the North Atlantic where gradients in sea surface temperatures between 40 and 60^{o}N effectively doubled during MIS 19 to 13 relative to MIS 11 to 1. The climates of MIS 19 to 13 are therefore dominated by more intense temperature gradients than the climates of MIS 11 to 1. These gradients are not simply latitudinal but also longitudinal. The high warmth experienced in western Europe during MIS 19 to 13 was probably driven by the Thermohaline Conveyer (THC). If the tropics remain warm during these interglacials then the THC will deliver warm tropical waters into the North Atlantic, maintaining high temperature levels in Britain during MIS 19 to 13. However, as this "warmth"

is driven by ocean circulation its effect will rapidly diminish eastwards in central and eastern Europe. It is therefore likely that during MIS 19 to 13, western Europe was an area of relatively high warmth in comparison to more continental settings. I will finish by asking whether the fact that the early Middle Pleistocene Palaeolithic record of northern Europe is dominated so heavily by sites in France and Britain is a function of the climatic setting. The question is therefore "Did a "warm corridor" exist in maritime western Europe that permitted the migration of early humans into northern Europe?"

The Pontnewydd Human Remains

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Pontnewydd Cave is in the Elwy Valley in North Wales. It was dug by Stephen Aldhouse-Green between 1978 and 1995. Pleistocene deposits containing archaeological material consist of two debris flows - Upper and Lower Breccia. The industry is dominated by bifaces, scrapers and Levallois products, manufactured from hard rocks (principally rhyolite and ignimbrite) and flint (especially used for retouched blades). The Lower Breccia is capped by a stalagmitic floor that has been dated at 225 ka using uranium series dating, and burnt flint artefacts within the Lower Breccia have been dated at 197 ka using thermoluminsescence dating. The fauna is MIS 7 and ESR dates on the fauna are mainly in the range 200-260 ka. (Aldhouse-Green et al 2012)

The 17 hominin teeth (plus a tooth fragment) discovered in the Lower Breccia and associated deposits represent a minimum of five individuals with age estimates, based on late Neanderthal development criteria, as follows – an 8.5 year old, a nine year old, an 11–11.5 year old, a young adult (14–16 years) and a mature adult. Based on tooth sizes, the individual with an estimated age of nine years (with two teeth) is possibly female and the remaining individuals possibly male. The maximum possible number of individuals represented is sixteen; nine juveniles/adolescents and seven adults. Two teeth were found in position in a maxillary fragment, the remainder being isolated finds. The crowns are mostly complete but the roots generally broken or absent.

The crown areas of the two smaller (possibly female) teeth are small compared with the mean crown areas of teeth from the major early Neanderthal site of Krapina in Croatia, and one of these, PN12, is also small compared with most European later Middle Pleistocene teeth, but similar in size to 'female' teeth from the Sima de los Huesos (SH) site at Atapuerca in northern Spain. The crown areas of the remaining teeth are large compared with most other European later Middle Pleistocene teeth and similar to the mean values of Krapina. The shape of the Pontnewydd teeth, and their relative size, fits better with later Middle Pleistocene material and Krapina than with earlier specimens. A Penrose size and shape coefficient calculated using length and breadth measurements shows a greater affinity of the shape of the Pontnewydd teeth to the Atapuerca-SH and Krapina samples than to a later European Neanderthal sample. Root measurements are comparable to those of Atapuerca-SH but the Pontnewydd roots are more robust.

The form of occlusal wear on molars suggests a diet with a large shearing component, probably indicative of an important element of tough fibrous vegetable foods. A similar form of wear is found in other European later Middle Pleistocene teeth but generally it is not so pronounced. There is a distinct difference between this and the form of wear described for the Krapina teeth. The rate of wear is relatively high in comparison with Krapina and some other later Middle Pleistocene teeth, and the frequency of occlusal chipping is high compared with other reference groups. There is some evidence of non-masticatory use of the teeth, in the form of unusual wear, and a lower lateral incisor and a lower fourth premolar exhibit faint 'cut-marks'.

Subvertical grooves (possibly caused by heavy chewing) occur on eleven interproximal facets. Only one tooth (the deciduous premolar) has a deposit of dental calculus. Hypoplasia – probably indicative of disease or starvation at a time when the teeth were still forming – occurs on four teeth, a higher frequency than that found at Atapuerca-SH. Anomalies of alignment and eruption are prevalent amongst the upper and lower premolars.

The morphology of the teeth is compatible with that of other European later Middle Pleistocene hominins, particularly where trends can be seen between earlier and later material. Traits that are characteristic of both European Middle Pleistocene hominins and Krapina Neanderthals, such as supraradicular taurodontism, mid trigonid crest and large hypocones on upper first molars, are present. Other traits that only occur on eastern Asian and north-west African Middle Pleistocene hominins, such as buccal cinguli on molars, are absent.

Later (Mesolithic and Neolithic) material discovered in unstratified deposits originating nearer the entrance to the cave consists of two lower molars, one in a mandibular fragment, a thoracic vertebra and a metatarsal. The two molars may come from the same individual, an adolescent (about 14–15 years based on dental development). The teeth are similar in size to the means of samples of European late Upper Palaeolithic and Mesolithic teeth.

Reference

Aldhouse-Green, S., Peterson, R., & Walker, E. (2012). Neanderthals in Wales: Pontnewydd and the Elwy Valley Caves. Oxbow

Some comments on the age of KC4

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A publication assessing the taxonomic status and ≥36,000 ^{14}C BP age of the human maxilla from Kent's Cavern (KC4) (Higham et al 2011) has recently received critical attention (White & Pettitt 2012). Specifically, White and Pettitt (2012) have questioned the proposed ≥36,000 ^{14}C BP age for the apparently modern human maxilla, citing the potentially poor stratigraphic provenance of KC4 and associated dated material, and also highlighting the incompatibility of this age with what is currently understood about Initial and Early Upper Palaeolithic (IUP/EUP) occupation of Britain and adjacent areas. This latter issue is explored here.

Despite the efforts of numerous researchers over recent decades, IUP/EUP material in Britain, Northern France and Belgium remains incompletely understood. Two factors in particular mean that the chronology of occupation is not well-documented: the early, coarse excavation of cave sites in Britain and Belgium and overall paucity of soundly dated IUP/EUP assemblages; and the total absence of dates for EUP sites in Northern France. Exacerbating this in Western Britain is the Last Glacial Maximum, which erased the majority of IUP/EUP archaeological material completely and doubtless depleted the little that survived.

It is here argued that modern human occupation around Kent's Cavern c.36,000 ^{14}C BP is by no means *a priori* archaeologically implausible when these limitations in the evidence are taken into account. Furthermore, lithic material from one Northern French site indicates that modern humans were present in the westernmost part of the Channel River basin 34-36,000 ^{14}C BP.

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The offshore Palaeolithic Landscapes at Happisburgh, North Norfolk

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Clement Reid (1890) was the first to describe the occurrence of offshore "Forest-bed" deposits at Happisburgh, following the deposition of "...large freshwater clay ironstone, and pan up on the beach at Happisburgh and Eccles" following a storm on January 30th 1877. Reid followed this event with an offshore dredge survey of the area during which they identified a "rocky bottom" and submarine cliff" which he inferred to be made of ironstone and was the potential source of the beach finds. The recovered slabs from the beach front were rich in floral and faunal remains including: "...impressions of leaves of oak, elm, beech, birch, and willow ; they contained seeds of the bog-bean, and casts of *Uiiio pictorwm, Pisidium, Paludina, Limncea*, and a species of fish, probably the roach.". Further, Reid (op cit) describes the recovery by oyster dredgers, three-quarters of a mile from the shore at Happisburgh, large quantities of bones and the molar teeth of elephants. Subsequently, material from this period has been added to with shoreline finds of large mammal bones contained within this ferricrete and there are now significant collections of this ironstone concreted faunal and floral material in the Natural History Museum, Norwich Castle Museum and in the hands of private collectors.

Through the analysis of contemporary and modern onshore and offshore geophysical and geological records for the area, encompassing both the coastal Happisburgh sites (1-4) and the proposed offshore location of Happisburgh 5, we can start to properly place these deposits in their spatial geological context. On the

basis of this analysis we have undertaken a series of preliminary ROV and actual diver exploration of four potential sites offshore of Happisburgh. These initial dives, although primarily focused at establishing the veracity of the methods in this quite challenging environment, have already identified in situ cemented sedimentary sequences which are currently undergoing further study. This preliminary work funded by AHOB has also partially underpinned an extended project, funded by English Heritage, to acquire further geophysical data and several more days dive time on sites along this coast. This talk will outline the work done to date and the planned dive field seasons for 2013.

Latest results from Happisburgh Site 1 (Norfolk, UK)

Mike H. Field

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Following a brief introduction to the recent excavations at Happisburgh Site 1 new data will be presented. In 2012 a trench exposed, for this first time, a calcareous facies which yielded mollusc fossils. The small assemblage gives an insight into the fluvial environment at the time of deposition and, also, contributes to the understanding of the age of the sediments.

Results from the palynological investigation of the fluvial sediments will also be discussed. Surveying of the channel has allowed the morphology of the channel to be more fully understood. In 2012 work concentrated on locating the Cart Gap side margin of the channel. Interesting results from this effort will be shown.

A high-resolution multi-proxy palaeoenvironmental record from Wing, Rutland, UK

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Quaternary sediments up to 18 m thick are preserved within a bedrock basin that is located on a ridge top at *ca* 120 m OD close to the village of Wing (NGR SK 898027). The deposits were cored in September 2009 using a Cobra petrol-driven percussion drill and supplementary hand augering. Five boreholes were completed successfully, with good recovery of sediment throughout. Preliminary results from this work were presented during the AHOB conference at the British Museum in April 2010. We now report on the significant progress that has been made in our understanding of the site.

The Quaternary succession at Wing consists in turn of a till, of deposits that span substages IIb–IV (*sensu* Turner & West 1968, 97) of an interglacial and, finally, of sediments that record the onset of a subsequent cold stage. The interglacial sequence has been described as one of the longest Ipswichian records in Britain (Hall 1980, 162). Given that the British temperate stage framework has subsequently been revised, that most Ipswichian sites lie below the lowest terraces of southern English rivers and that there has been no independent dating of the

sediments, it was thought appropriate to review the age and wider significance of the interglacial sequence at Wing.

A suite of high-resolution environmental reconstruction methods has also been applied to the succession. Palaeotemperature estimates have been derived from the beetle (the BugsColeopteran Ecology Package), chironomid (the two-component WA-PLS inference model) and ostracod assemblages (the Mutual Ostracod Temperature Range method). A reasonably consistent picture of changes in winter and summer temperatures and hydrology is provided. Additional palaeotemperature indications may be forthcoming from the pollen and plant macrofossils.

Even though till lies at the base of the Quaternary infill at Wing, the basin is unlikely to have resulted from subglacial erosion (*contra* Hall 1980). Rather, its architecture, regional geological setting and probable formation part-way through an interglacial stage suggest that a structural origin is more likely. The site lies within the classic east Midlands belt of non-diastrophic bedrock structures (Hollingworth *et al.* 1944; Jones 2002; Cooper *et al.* 2011). Site-investigation boreholes drilled in advance of the construction of the adjacent Murcott Water Treatment Works provide abundant evidence that the near-horizontal Jurassic beds close to the basin have undergone significant faulting. Thus we propose that the sediments have been trapped in a mini-graben or mega-gull measuring *ca* 100 m across resulting from non-diastrophic movements within the underlying bedrock. Comparable upland sites such as Glaston, Rutland (*ca* 3 km from Wing) (Cooper *et al.* 2011, 4–6, 17–18) and Beedings, West Sussex (Pope 2010, 8) have shown that non-diastrophic structures are important for the preservation of archaeology, a potential that has yet to be fully explored at Wing.

The palaeoenvironmental reconstruction, timing of events, origin of the basin and the wider implications of the site will be reviewed.

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Quantitative palaeoclimate reconstruction of MIS9 interglacial deposits in SE England by multi-proxy consensus

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Biological proxies such as foraminifera, ostracods, diatoms, chironomid larvae, molluscs and pollen are widely used to estimate palaeoclimatic parameters, most commonly palaeotemperatures. Indicator species, Mutual Climatic Range (MCR), Modern Analogue Technique (MAT) and transfer function approaches are based on the ecology and distribution of living taxa, while geochemical techniques measure and interpret trace elements and stable isotope ratios preserved in, e.g., ostracod shells or foraminiferal tests. Any single proxy method will yield a result, often a plausible one, but the arguments used to justify the results are often inadequate and there is a need for more rigorous, multi-proxy comparative testing to validate such methods. The Mutual Ostracod Temperature Range (MOTR) method is an MCR approach for non-marine ostracods; if it is any good then it should provide true palaeotemperature estimates – a statement that can be applied to any proxy method. It follows that two or more proxy methods applied to the same interval at the same site should yield results that, if not identical, are at least consistent; if they are not, the validity of at least one (and potentially all) of the methods is called into question. The Multi-Proxy Consensus (MPC) approach not only tests two or more proxies against each other in order to validate (or not) their results, but also (subject to validation) enables a more precise palaeoclimate determination to be obtained from, e.g., the range of mutual agreement between two or more overlapping palaeotemperature ranges.

Studies of MIS9 interglacial deposits in the Thames-Medway system in SE England have yielded palaeotemperature ranges and threshold values based on a variety of proxies including ostracods, beetles, fish, herpetiles, pollen and plant macrofossils.

Application of the MPC approach demonstrates the consistency of the palaeotemperature estimates and defines a more continental climate than today, with mean July air temperatures the same or one degree warmer, and mean January air temperatures at least two degrees colder. Mapping the MPC-derived palaeotemperatures in a GIS suggests that a modern analogue climate could be found in northern Germany. This result favours a correlation of the Thames-Medway fluvial deposits with the earliest, warmest substage of MIS9.

A preliminary report on recent geological fieldwork at Happisburgh, Norfolk

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Since the publication of the work at Happisburgh Site 3 (HSB3) by Parfitt *et al.* (2010), the focus of on-going fieldwork has shifted towards attempting to integrate the results from this narrow strip of sediments beneath the modern beach that has been systematically excavated since 2005 with geological and archaeological information from HSB1 (*cf.* Field, 2012), new geological data from a borehole survey and onshore and offshore geophysical surveys; preliminary results from the various aspects of this work will be presented at this workshop. The onshore geological component of this work has used a range of coring methods to attempt to establish the relationship between the HSB3 and HSB1 sequences. Work thus far has focused on HSB1, where it is now possible to constrain the geometry of the deposits with some precision. A series of Cobra-driven boreholes have also been sunk in the intervening area between HSB1 and HSB3, though ground conditions limited the depth of the holes and the recovery of material. Additional information has been obtained as a result of further deterioration of the sea defences, accompanied by continuing cliff retreat and removal of the beach sands by winter storms in 2011−12, which has provided an opportunity to observe and record foreshore exposures not hitherto available. Preliminary results of this phase of fieldwork will be presented and their implications for understanding the important archaeological sequence at Happisburgh will be discussed.

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New field work at Warren Hill, Mildenhall, and further consideration of the Bytham River hypothesis

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Warren Hill is of particular significance for the British Lower Palaeolithic having yielded one of the largest assemblages of handaxes in Britain (Wymer, 1985); more recently, it has formed an important component in the reconstruction of the Bytham River and its associated Palaeolithic archaeology (Bridgland et al., 1995; Rose 2009). Gibbard and co-workers have recently questioned the attribution of the deposits at Warren Hill to the Bytham River. They propose that the deposits are of glaciofluvial origin and that they form a series of sediments and landforms marking the eastern margin of an MIS 6-age Wash/Fen basin ice lobe (Gibbard *et al*., 2009, 2012a, b).

This paper reports preliminary results of fieldwork recently undertaken at Warren Hill. The aim of this fieldwork was to investigate further the stratigraphic relationships between the sequence at Warren Hill itself and glaciogenic and fluvial sediments in the vicinity of the site. In addition the possibility of establishing the stratigraphic relationship with the nearby site of High Lodge was also explored. Following this brief account of recent activity, some of the wider issues concerning Gibbard *et al*.'s (2013) challenges to the Bytham River model will be considered.

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Missing cat

Simon Parfitt

Palaeoclimatic characterisation of early human environments in southern Spain

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The central sector of the Guadix Basin (Betic Cordillera, Granada Province, Spain) is a key area for exploring the evolution and migration of early humans and associated fauna into Europe from Africa and Asia. Its importance stems from the presence of continuous geological sedimentation over the last 4 million years and the excellent preservation of a large number of archaeological and palaeontological sites from this time range.

Since 2001, more than 40 new palaeontological sites have been located in the area, and detailed stratigraphical, sedimentological and petrological studies have been carried out, with the aim of characterising the palaeoenvironmental evolution of the Guadix Basin over the last 4 Ma. The nature of the sediments, mainly fine grained floodplain fluvial sediments and all types of continental carbonates, prevented the preservation of pollen, beetles and chironomids in the Guadix Basin, although vertebrates, ostracods and molluscs are well represented. Continental carbonates such as calcretes, paleosol nodules, palustrine limestones and tufas are also well represented in the area. Thus, the geochemical characterisation of these carbonates and their use as paleoclimate proxies is crucial for reconstructing the palaeoenvironment in which vertebrate faunas of Asian, European and African origin lived during the Pliocene and the Pleistocene in southern Spain.

In this presentation we discuss the most recent results from the stable isotope analyses performed on the continental carbonates of the central sector of the Guadix Basin. Apart from the expected differences observed in the isotopes sampled from different types of carbonates, an evolution in the isotopic signal has been detected from the oldest to the youngest sediments in the basin. This is reflected by a dramatic change in the isotopic trends coinciding with the boundary between the two youngest genetic units (Pliocene-Pleistocene) from the six that have been identified in the sedimentary infill of the Guadix Basin.

The Lateglacial faunal assemblage from Gully Cave, Ebbor Gorge, Somerset: chronology, taphonomy and palaeoenvironmental change

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This paper provides an update on the AHOB-funded excavations at Gully Cave in Ebbor Gorge. Although notable for some spectacularly rich individual sites, the Palaeolithic archaeology of the south-west region is relatively poorly known in Britain, reflecting an absence of robust geochronological frameworks, the predominance of research into a handful of cave and open sites over the lithic scatter resource and a lack of major syntheses. The numerous small caves in Ebbor Gorge are well-known for their later prehistoric remains but in contrast to the much better-known Cheddar Gorge to the north-west, only glimpses of Palaeolithic occupation and Pleistocene fauna have been seen thus far.

Since 2006, excavations at the previously unexplored Gully Cave have exposed the upper part of the cave fill and revealed a red, limestone-rich breccia, capped by a densely cemented carbonate flowstone. The breccia has proved to be spectacularly rich in the remains of Late Pleistocene fauna, with 23 mammalian taxa, at least 7 bird taxa and 19 molluscan taxa, making it one of the richest terminal Pleistocene sites in Britain, if not the richest.

In 2012, an extensive programme of radiocarbon dating was undertaken, which revealed that the cave deposits excavated so far span the early Lateglacial interstadial (Bølling, Greenland Interstadial 1e) to the early Holocene. Currently, there is no other cave site in Britain that has this level of completeness for this part of the Late Pleistocene, allowing patterns of high-resolution climate change visible in long proxy records such as the Greenland ice cores to be directly compared with a terrestrial sequence.

New views on the MIS 6 Neanderthal occupation sequence at La Cotte de St Brelade, Jersey.

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La Cotte de St Brelade provides the key sequence for long term human occupation and climate change records in North West Europe from MIS 7 through to MIS 6. During a period between 1950 and 1979 a series of Saalian (MIS 7/6) deposits containing an exceptionally rich lithic artefact assemblage was excavated successively by Burdo and McBurney. The combined collection of almost a quarter of a million artefacts from successive stratigraphic units forms the largest database of Neanderthal activity from a single site in northern Europe. Alongside the stone tools faunal remains were recovered including two bone heaps comprising elements of mega-fauna including mammoth and woolly rhinoceros. The latter were interpreted by Kate Scott as possibly representing the remains of two game drive events which involved the mass herding of animals into the ravine system at the site.

The archaeology of the Saalian deposits at La Cotte de St Brelade was readdressed by the QAEJ team during a process of archive review and reorganisation, occurring alongside bathymetric survey and the NERC sponsored fieldwork of later deposits at the site. In becoming familiar with the material, its stratigraphic context and the wider landscape context of the site, the team have acquired a new and developing perspective on its archaeology and on the bone heaps. This new views sees the La Cotte sequence as being a rhythmic, discontinuous record of Neanderthal occupation with apparent intensive use of the site as an occupation locale, separated by sterile loess layers indicative of abandonment, perhaps in response to climatic cooling. The occurrence of the bone heaps at the interface between occupation and sterile horizons brings back into focus the interpretation choices considered by Callow, Scott and Cornford during the 1986 publication of the site. In combination with consideration of the wider topography of the La Cotte headland and mapped off shore valleys, as well as the differences in lithic technology

between the separate occupation levels new questions are starting to be framed around the interpretation of the site.

These questions will form the basis of future analytical work planned for the Saalian assemblages and will focus on raw material use, artefact reduction sequences, taphonomy and faunal composition. The remarkable datasets from CSB hold the potential for further elucidation of variation in Neanderthal settlement behaviour, their responses to climate change and strategic use of landscapes as part of hunting strategies.

Reconstructing the Late Middle and Upper Pleistocene sequence at La Cotte De St. Brelade, Jersey: 200,000 years of human presence and absence.

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The site of La Cotte de St. Brelade has been the subject of sporadic excavation over the last 120 years. During this time hundreds of tonnes of material have been removed from the site. This complex and extended history of investigation has inhibited understanding of the site's complete stratigraphic sequence. As a result, La Cotte tends to be characterized through a series of snapshots; most notably relating to two Saalian megafaunal 'bone heaps' (Scott 1980) and two sets of post-Eemian human skeletal fragments (thirteen Neanderthal teeth and a human occipital fragment) (Keith & Knowles 1912, Angel & Coon 1954, Stringer & Current 1986). This has obscured the fact that the site has produced an extended sequence of deposits rich in lithic artefacts, anthropomorphic debris and palaeoenvironmental proxies which span much of the late Middle and Upper Pleistocene.

Extensive archive research, coupled with a new phase of field investigations, has enabled the first complete overview of the stratigraphic sequence from La Cotte, within which this archaeological and palaeoenvironmental material can be replaced. This has demonstrated that deposits within the La Cotte fissure system can be related to the three distinct phases of deposition: MIS 7/6, the Eemien to early/middle Weichselian (MIS 5e – MIS 3) and the later Weichselian to Holocene. Within this there exist at least twelve phases of Neanderthal occupation, separated by five phases of site abandonment. Furthermore, it has been established that the human fossils from the site belong to two chronologically distinct units. This new understanding of the complete stratigraphic sequence, coupled a programme of Optically Stimulated Luminescence dates, is allowing the changing nature of human occupation throughout the late Middle and Upper Pleistocene at La Cotte to be investigated for the first time.

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Human populations in Eurasia during the late Pleistocene

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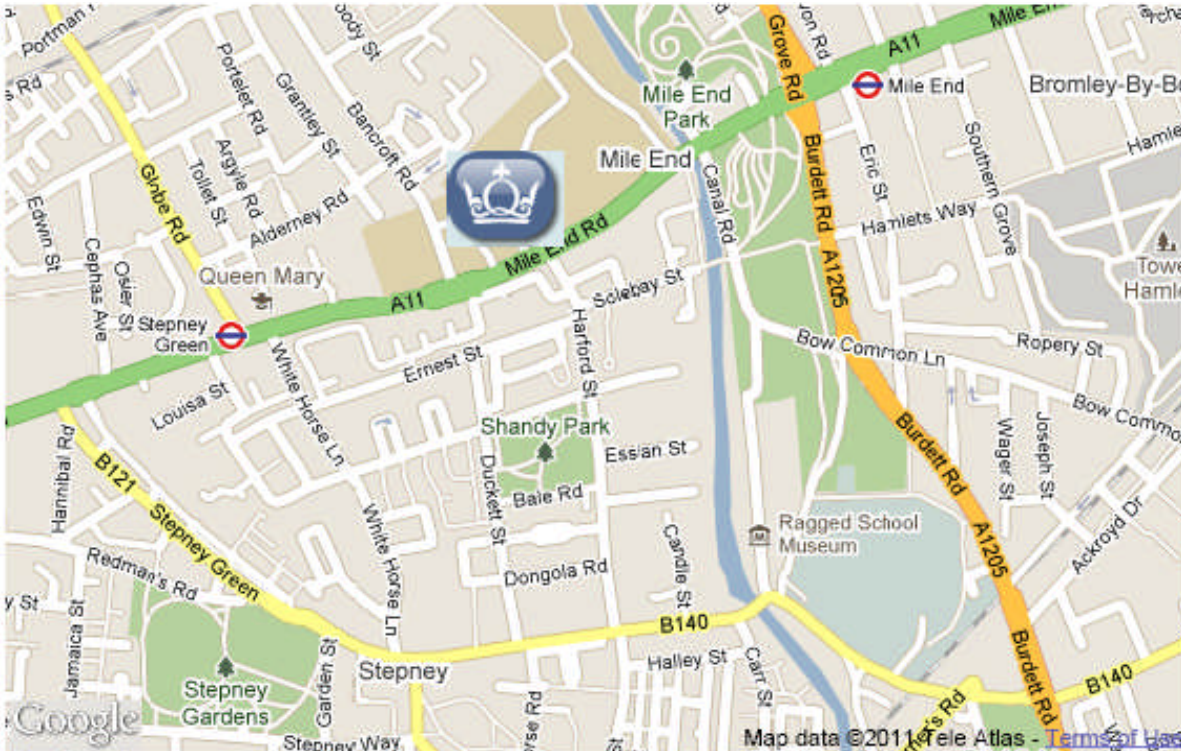
Although fossil material indicates that early modern humans were present in the Levant during Marine Isotope Stage 5, there is currently no reliably dated physical evidence that they extended further out of Africa at this time. Nevertheless, early modern humans may also have occupied adjoining regions such as Arabia at this time, and such areas could have acted as subsequent out-of-Africa refugia. Although there are claims that populations could have extended to the Indian sub-continent by the end of MIS5, this is not well supported by available fossil, archaeological or genetic evidence. The date of the subsequent re-establishment of modern humans in the Levant is often estimated from genetic data to be about 60ka. Although there is much debate about adjustments to the genetic (largely mitochondrial) calibrations concerned, and possible indications of multiple dispersals, the data still largely favour one exit at ~60ka, or perhaps several closely spaced exits at this time. Such ages precede the emergence of Later Stone Age/Upper Palaeolithic industries, and thus there is the expectation of other early modern human fossils outside Africa being associated with Middle Palaeolithic technology. While this expectation is met in the earliest Australian human fossils, and perhaps also in the maxilla from Ksar 'Akil (Lebanon) and temporal bone from Darra-i-Kur (Afghanistan), other finds either have no diagnostic archaeological associations (e.g. Oase, Romania; Tianyuan, China; Tam Pa Ling Laos) or indications of at least Initial Upper Palaeolithic associations (e.g. Kent's Cavern 4, Cavallo, Üçağızlı, Ksar 'Akil 1).

Improvements in radiocarbon dating are leading to revisions in the chronology of modern human arrivals in Europe, and it now seems likely that pre-Aurignacian dispersals traversed the south of the continent. Despite attempts based on chronological and morphological grounds to question recent research on Kent's Cavern 4, an additional pre-40ka movement is likely to have reached western Britain, but the archaeology associated with the earliest known northern dispersal may have been Aurignacian or pre-Aurignacian. The physical nature of the populations concerned remains obscure, however, given the fragmentary nature of the record prior to the Oase fossils. While it is possible to correlate these dispersals with interstadial events, it is currently unknown whether the populations concerned survived subsequent stadials prior to 40ka.

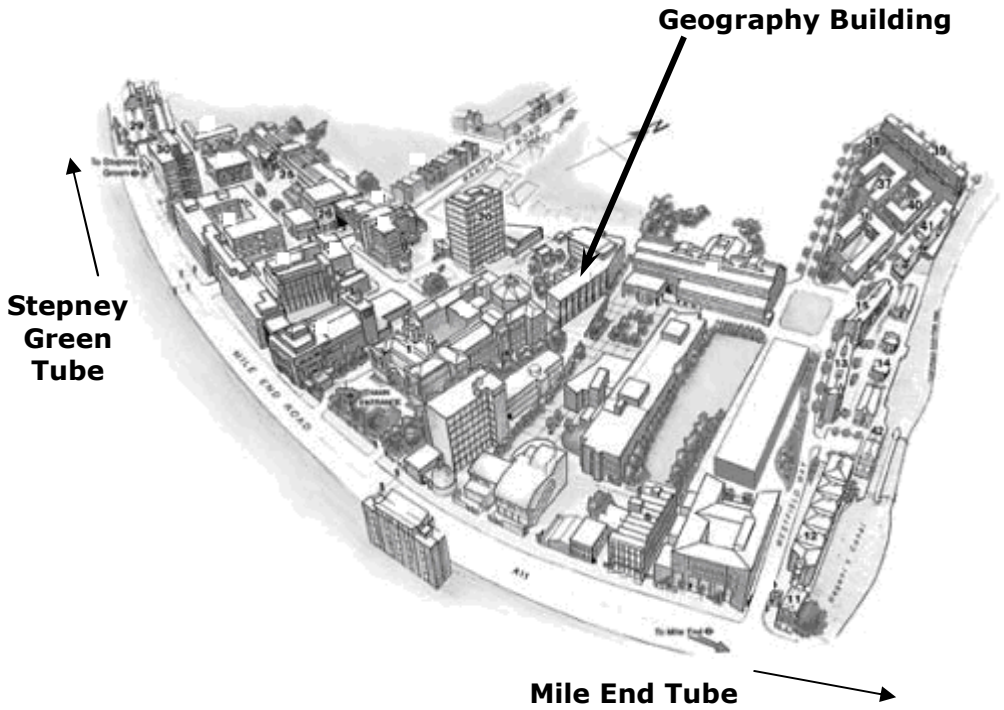
New genetic data continue to add detail and complexity to the early dispersal history of modern humans. It is currently unclear whether there was one, several, or multiple 'hybridisation' events between early modern humans and Neanderthals,

and it is equally unclear whether the relatively low level of extant remnants of introgression is due to the rarity of the interbreeding itself, or to cultural or biological limitations on its success. In the case of Denisovan-modern human interbreeding, it is so far unclear when and where the hypothesised introgression occurred, but it must have been quite limited geographically. And still entirely unexplored is the likelihood and impact of Neanderthal-Denisovan hybridisation, which must surely also have occurred, given the extensive spatial and temporal overlap of these evolving Eurasian lineages.

Directions for AHOB Workshop

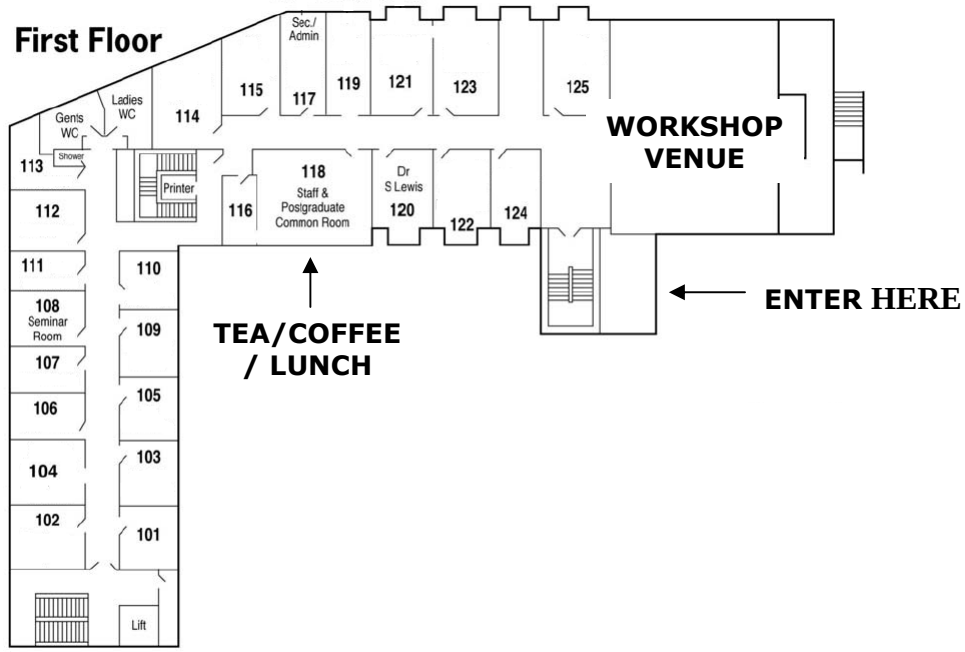


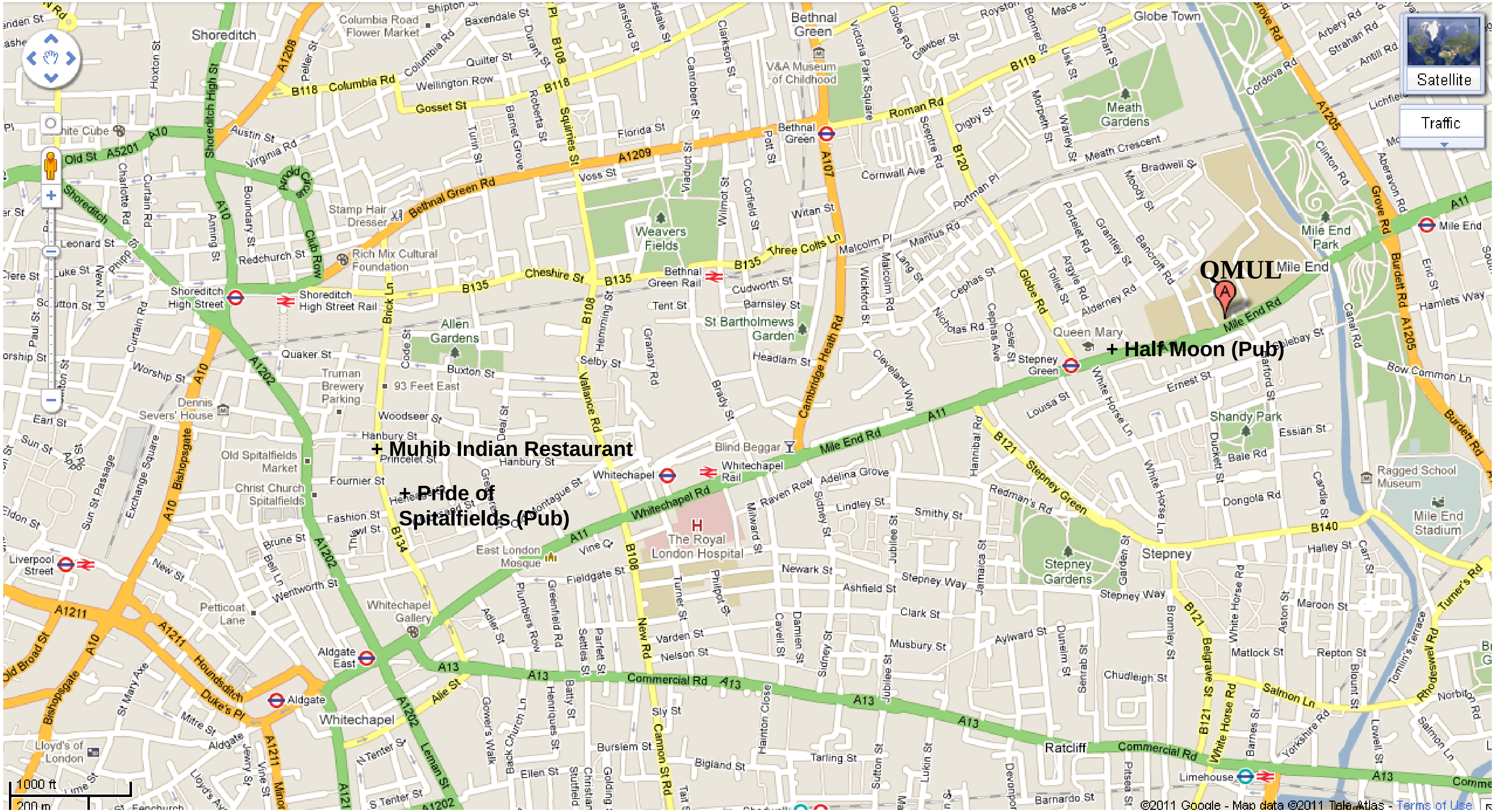
QMUL Mile End Campus is equidistant between **Stepney Green** (District and Hammersmith and City lines) and **Mile End** (Central, District and Hammersmith and City lines) tube stations. The **25 and 205** buses also run along the Mile End Road. There is a bus stop close to the main entrance. There is a Bike hire stand close to the front entrance of College.



The AHOB Workshop will be in Lecture Room 126, which is on the 1st floor of the Geography Building. Enter the Geography Building by the stairs with glass on three sides, **go <u>up the stairs</u> to the 1st floor**. The lecture room is on the immediate right of the foyer (adjacent to wall mounted TV screen).

Coffee can be bought from cafés in locations marked 52, 53 and 54 on the map below. There is also a coffee shop (Roastars Coffee) under the 'green bridge' on the way from Mile End tube station.

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