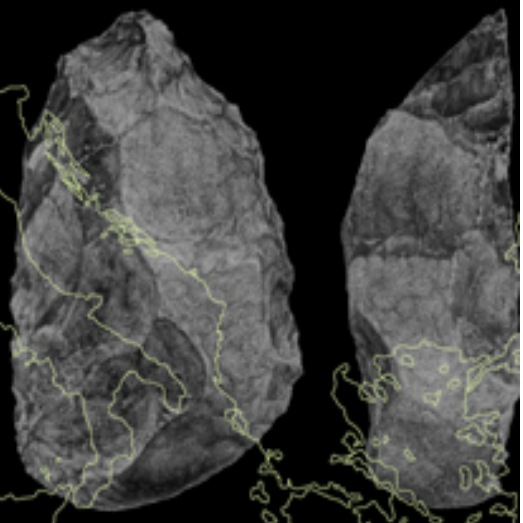
Second Workshop of AHOB2: Ancient Human Occupation of Britain and its European Context

Edited by
Chris Stringer and Silvia Bello



AHOB, London
March 26-27th, 2009

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

2nd AHOB2 Workshop

The British Museum, Sackler Rooms

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Thursday 26th March

10.00 Welcome from Chris Stringer and Nick Ashton

Session 1: *The earliest occupation of Europe*

Chair: Simon Lewis

10.10	Biogeography as a context for human dispersal	J. van der Made
10.35	The European human fossil record and its relevance to AHOB	C. Stringer
11.00	***Coffee***	
11.20	Biostratigraphic and aminostratigraphic constraints on the Middle Pleistocene glacial succession in north Norfolk and its relevance for Palaeolithic archaeology	R. Preece, S. Parfitt, R. Coope, K. Penkman, P. Ponel and J. Whittaker
11.45	The environment of early humans in England: what the beetle saw	R. Coope
12.10	Early Middle Pleistocene Landscapes of Suffolk: An Update on The Environmental Archaeology of Flixton Quarry	B. Silva, I. Candy, J. Rose, D. Schreve, M. White, R. Coope, P. Schreve, M. Lewis
12.35	***Discussion***	
12.50	**Lunch**	

Chair: John McNabb

13.50	Mapping the human record in the British early Palaeolithic: Evidence from the Solent River system	N. Ashton and R. Hosfield

14.15	New results from the examination of cut-marks on the human incisors from Boxgrove (West Sussex, England)	S. Bello and S. Parfitt
14.40	Evidence of the first human settlements during the Lower and Middle Pleistocene in the alluvial formations of the Middle Loire Basin (Région Centre – France)	J. Despriée, P. Voinchet, H. Tissoux, J.-J. Bahain, R. Gageonnet, J. Dépont, G. Courcimault, M.-H. Moncel, M. Arzarello, S. Robin, C. Falguères, S. Puaud, D. Moreno, L. Marquer, E. Messager
15.05	Chronostratigraphical and palaeoenvironmental approach of Acheulean occupation in Northern France (Somme, Seine and Yonne River valleys)	P. Antoine, P. Auguste, J-J. Bahain, C. Chausse, N. Limondin-Lozouet, J-L. Loch and P. Voinchet
15:30	La Celle: one of the oldest Acheulean settlements from Northern France during an Interglacial period (MIS 11)	N. Limondin-Lozouet, P. Antoine, E. Nicoud, P. Auguste, J-J. Bahain, J. Dabkowski, J. Dupéron, M. Dupéron, C. Falguères, B. Ghaleb, M-C. Jolly-Saad
15.55	***Discussion***	
16:10	**Tea break**	

Session: ***Poster and Demonstration 1***
Chair: Nick Ashton

16:30	Pronounced climate warming during early Middle Pleistocene interglacials: investigating the mid-Brunhes event in the British terrestrial sequence	I. Candy, B. Silva and J. Rose
16.45	Palaeophylogeography of British *Arvicola* (water vole) since the last glacial period	M. Ruddy
17.00	Geometric Morphometric Analysis of *Microtus* remains: Preliminary Results	L. Killick
17.15	***Discussion***	

17:30 Refreshments and buffet meal (details to follow)

Friday 27th March

Session 2: *The end of the Lower Palaeolithic, and the Middle Palaeolithic revolution*

Chair: John Stewart

10:00	Glacial Chronologies Spanning the Past 450 ka Around the Margins of the Southern North Sea: implications for the age of the Strait of Dover	S. Pawley, J. Rose, K. Rijsdijk, T. van Dijk, M. Bakker, P. Antoine, F. Busschers
10.25	Living on the edge; a British view of the European Early Middle Palaeolithic	B. Scott, N. Ashton and C. Ryssaerts
10.50	Recent fieldwork at Kesselt-*Op de Schans* (Limburg, Belgium): Preliminary results	A. Van Baelen and P. Van Peer
11:15	***Coffee***	
11.35	Early Palaeolithic occurrences in the Haine region (Belgium). Some trends in lithic technology	C. Ryssaert
12:00	Mammal associations in the Pleistocene of Britain: implications of ecological niche modelling	P.D. Polly, J. Eronen
12:25	Ebb and flow or regional extinctions? On the character of Neandertal presence in northwestern Europe	W. Roebroeks
12.50	***Discussion***	
13:10	***Lunch***	

Session 3: *Cultural complexity and dating humans during and at the end of the last glaciation*

Chair: Andy Currant

14:10	Improving the radiocarbon dating of the Middle to Upper Palaeolithic transition in Europe	T. Higham and R. Jacobi
14:35	Humans and animals in the Lateglacial of England and Wales	R. Jacobi and T. Higham

15:00	Star Carr in the New Millennium: Recent excavations	C. Conneller, N. Milner and B. Taylor
15:25	***Discussion***	
15:40	**Tea break**	

Session: ***Poster and Demonstration 2***
Chair: Chris Stringer

16:00	First record of human occupation during the Eemian Interglacial in northern France (Caours, Somme Basin)	P. Antoine, N. Limondin-Lozouet, P. Auguste, J-L. Locht, B. Galheb, J-J. Bahain
16:15	Environments of Lateglacial human occupation at Sproughton; occupation of a bar surface and new work on the laminated sediments.	R.S. Waghorne, I. Candy, J. Rose, D. Schreve, R. Jacobi, S. Armatage and S.J. Booth
16:30	The AHOB2 Database	D. Polly
16:45	***Final Discussion***	
17:15	**Meeting finishes**	

Abstracts

Chronostratigraphical and paléoenvironnemental approach of Acheulean occupations in Northern France (Somme, Seine and Yonne River valleys)

Pierre Antoine[1], Patrick Auguste[5], Jean-Jacques Bahain, Christine Chausse[3], Nicole Limondin-Lozouet[1], Jean-Luc Locht[4] and Pierre Voinchet[2]

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5. Université de Lille 1, Laboratoire Géosystèmes (UMR 8157 CNRS), Bât-SN5, 59 655 Villeneuve d'Ascq

Researches undertaken for more than 15 years on both fluvial and loess sequences of the main river valleys in Northern France (Somme, Seine and Yonne) are based on an interdisciplinary approach combining stratigraphy, sedimentology, bioclimatic studies and a very important development of geochronology (U/Th, ESR, OSL …).

At the same time the investigations on the bottom valley fluvial sequences (Lateglacial and Holocene) allowed to evidence a model concerning the response of fluvial systems to climatic changes allowing to integrate the whole dataset concerning the Middle Pleistocene. Finally, the integration of the results from modern archaeological excavations within the chrono-climatic reference system of northern France led to the following results:

- From a general point of view, it is more and more likely that Human occupation in the Somme, Seine and Yonne basins has been discontinuous and highly influenced by climatic and environmental factors (impact on the biomass and of large mammal populations).
- In the Somme basin the oldest demonstrated human occupations are dated at a maximum 450-500 ka (Early MIS 12, Cagny-la-Garenne) and are already represented by evolved Acheulean assemblages. In the Seine basin, the oldest Acheulean archaeological level has been evidenced at La Celle, within a tufa sequence attributed to MIS 11 and dated at 400-420 ka by U/Th and ESR.

Between 450 ad 200 ka the data are relatively rare and less accurate but the archaeological sites seams nevertheless to be mainly located during

interglacial periods (La Celle, Saint-Acheul, Soucy, Cagny-Epinette) or climatic transition as Early or Late glacial).

● Taking in account the whole data and especially the available dating results for the oldest levels, the Acheulean don't seem to have occurred in the area before 500 ka.

Indeed, the old discoveries as those the "Marne blanche" at Abbeville (MIS 15, ± 600 according to its relative height in the system and to ESR results), need to be confirmed by new investigations.

On the other hand oldest human occupations seems to appear more to the south in the Cher Valley (Lunery, La Noira) as on the other side of the Channel (High Lodge, Pakefield, Happisburgh 1-3, Cromer). Taking in account these observations, it is likely that the main river valleys from the south side of the Channel (Somme, Seine), representing main migration tracks during periods of low sea levels, contain Old Acheulean occupations contemporaneous of the older phase of the Cromerian complex (± 500-650 ka) that are still to be evidenced.

Reference

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Antoine, P., Auguste, P, Bahain, J.J., Coudret, P., Depaepe, P., Fagnart, J.P., Falgueres, C., Fontugne, M., Frechen, M., Hatté, C., Lamotte, M., Laurent, M., Limondin-Lozouet, N., Locht, J.L., Mercier, N., Moigne, A.M., Munaut, A.V., Ponel, P. & Rousseau D.D. 2003. Paléoenvironnements pléistocènes et peuplements paléolithiques dans le bassin de la Somme (Nord de la France) Bulletin de la Société préhistorique Française (100)-1, 5-28.

Antoine, P., Limondin-Lozouet, N., Chausse, C., Lautridou, J.P., Pastre, J.F., Auguste, P., Bahain, J.J., Falguères, C. & Galehb B. 2007. Pleistocene fluvial terraces from northern France (Seine, Yonne, Somme): synthesis and new results. *Quaternary Science Reviews*. 26, 2701-2723.

First record of human occupation during the Eemian Interglacial in northern France at Caours (Somme Basin)

Pierre Antoine[1], Nicole Limondin-Lozouet[1], Patrick Auguste[2], Jean-Luc Locht[4], Bassam Galheb[4] and Jean-Jacques Bahain[5].

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5. Institut de Paléontologie Humaine, Laboratoire de Préhistoire du Muséum National d'Histoire Naturelle, UMR 6569 du CNRS, 1, rue René Panhard, F-75013 Paris. E-mail: bahain@mnhn.fr, falguere@mnhn.fr,

The new investigation lead on the tufa deposit of the River Somme basin, within the CNRS SITEP Program*, have allowed the discovery of a new tufa sequence overlying an alluvial formation at Caours (Scardon valley). The relative height of this alluvial formation above the modern valley bedrock (+ 6m), indicates a low terrace position within the Somme terrace system. The tufa sequence is separated from the underlying periglacial alluvial gravels by fluvial calcareous silts overlain by a little marshy soil then by a thin peat layer. The tufa formation itself is mainly composed by paludal (marshy) soil faces showing numerous *in situ* incrusted vegetal remains and travertine concretions (stromatolithes).
Downslope, looking to the present day valley the whole tufa formation rapidly passes through typical fluvial facies including oncolithic sands and large scale cross beddings. The tufa sequence and the upper part of the underlying fluvial silts and marshy soil have provided an abundant malacological fauna that allowed describing a climatic evolution contemporaneous of the initial phases of an interglacial, followed by the a climatic optimum (up to 70% of forest snails). The organic horizons located at the base of the tufa sequence have also provided numerous large mammals (Aurochs, Cervids) and rodent remains (*Talpa europaea, Sorex* cf.

araneus, *Clethrionomys glareolus Apodemus sylvaticus*, *Arvicola* cf. *terrestris*) contemporaneous of the interglacial optimum.

Within these organic horizons, several Palaeolithic layers have been discovered *in situ* in association with interglacial large mammal remains showing evidences of human operation (systematic breaking of long bones and cut marks). Taking into account its relative position within the Somme terraces system, the U/Th ages (average ± 123 ka BP) and the results of the bioclimatic studies, the Caours sequence represents the first record of the Eemian interglacial in the Somme basin. The archaeological levels discovered at Caours represent a unique example of Human occupation during the Last Interglacial in Northern France. Finally the investigations of the whole sequence allow to demonstrate that a first main incision phase occur within the fluvial system at the transition between the Eemian interglacial and the Weichselian Early-Glacial.

* Climatic Signature of Pleistocene Interglacials within European tufa, response of the environments and impact on the Palaeolithic occupations.

Reference

Antoine P. Limondin-Lozouet, N., Auguste, P., Locht, J.L., Gahleb, B., Reyss, J.L., Escude, E., Carbonel, P., Mercier, N., Bahain, J.J., Falgueres, C. & Voinchet P. 2006. Le tuf de Caours (Somme, Nord de la France): mise en évidence d'une séquence de tufs calcaires eemiens et d'un site paléolithique associé. *Quaternaire,* 17 (4), 281-320.

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Mapping the human record in the British early Palaeolithic: evidence from the Solent River system

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2. Department of Archaeology, University of Reading, Whiteknights Box 226, Reading, RG6 6AB, UK

The lithic record from Solent River and its tributaries are re-examined in the light of recent interpretations about the changing demography of Britain during the Lower and Middle Palaeolithic. Existing models of the terrace stratigraphies in each of the tributary areas are reviewed and the corresponding archaeological record (specifically handaxes) for each terrace is assessed in detail to provide models for the relative changes in human occupation through time. The Bournemouth area is studied in more detail to examine the effects of quarrying and urbanisation on collection history and on the biases it introduces to the record. In addition, the effects of reworking of artefacts from higher into lower terraces are assessed, and shown to be a significant problem. Although there is very little absolute dating available for the Solent area, a cautious interpretation of the results from these analyses would suggest a pre-MIS 12 date for the first appearance of humans, a peak in population between MIS 12 and 10, and a decline in population during MIS 9 and 8. Due to poor contextual data and small sample sizes, it is not clear when Levallois technology was introduced. This record is compared and contrasted to that from the Thames Valley and how the changing palaeogeography of Britain might have affected the human occupation of these areas.

New results from the examination of cut-marks on the human incisors from Boxgrove (West Sussex, England).

Silvia M. Bello[1] and Simon Parfitt[1,2]

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Various studies have documented the presence of scratches on the labial surfaces of the anterior teeth in recent and fossil humans. These marks have been used to infer feeding behaviour (e.g. dietary striations) and cultural activities, such as use of toothbrushes and toothpicks, post-mortem manipulations (e.g. cannibalism) and processing of food or non-dietary items (e.g. skins). Previous studies have used scanning electron microscopy (SEM) or light microscopy to study these striations, however none of these studies have adequately analysed the micro-morphological characteristics because of the limitations of the imaging methods employed.

In this talk, we present the results of a three-dimensional micro-morphological analysis (Bello and Soligo, 2008; Bello et al., in press) of scratches on the ~500,000 year old human incisors from Boxgrove, West Sussex. This preliminary work has identified three different types of marks on the incisors: 1. straight striations on the enamel of the crowns, 2. semi-circular striations also on the enamel of the crowns and 3. wider and deeper striations on the roots.

The morphology of the straight cut-marks is consistent with 'non-masticatory striations', resulting from the cutting of food or other materials that were gripped between the front teeth. During this process, the stone tool occasionally came into contact with the tooth. Similar marks have been observed on the anterior teeth of Modern humans and Neanderthals, but they have also been recorded on teeth of *Homo heidelbergensis*. Boxgrove may represent the earliest evidence for this behaviour in a pre-Neanderthal population.

Semi-circular cut-marks on the crown and cuts on roots (figure 1) have not been recorded on any other hominin specimen and it is therefore difficult to attribute them to a specific action. In this talk we suggest

possible explanations for these marks and discuss their behavioural significance.

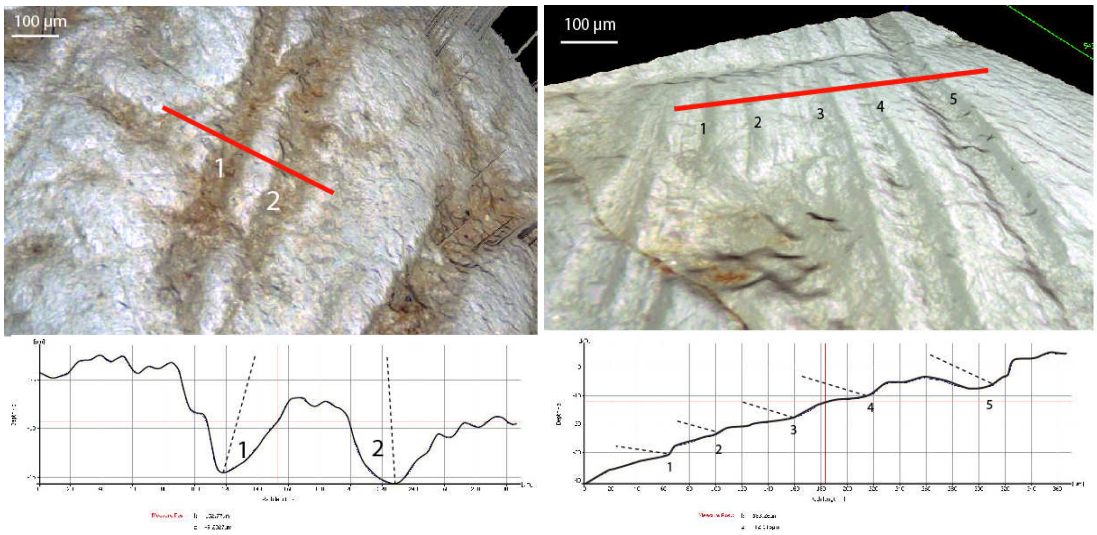

Figure 1: Alicona images and profile analyses of cut-marks on the root (left) and semi-circular cut-marks on the crown (right) of Boxgrove 3 (lateral incisor).

Reference

Bello S.M. and Soligo C. 2008. A new method for the quantitative analysis of cutmark micromorphology. *Journal of Archaeological Science*, 35: 1542-1552

Bello S.M., Parfitt, S.A. and Stringer C., in press. Quantitative micromorphological analyses of cut marks produced by ancient and modern handaxes. *Journal of Archaeological Science*,

Pronounced climate warming during early Middle Pleistocene interglacials: investigating the mid-Brunhes event in the British terrestrial sequence

Ian Candy[1], Barbara Silva[1] and Jim Rose[1]

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Many long-term, continuous records of environmental change (i.e. EPICA, SPECMAP) record a *Mid-Brunhes event* (or MBE). The MBE, occurring approximately 500,000 years B.P., records a shift in climatic style from moderate-intensity climate oscillations during the early Middle Pleistocene to high-intensity climate oscillations during the late Middle and Late Pleistocene. In records such as EPICA and SPECMAP, early Middle Pleistocene interglacials appear to be significantly cooler than those that occurred after MIS 12. Specifically, prior to the MBE no interglacial episode is characterised by the intensity of climate-warming, nor the extreme reduction in global ice volume that routinely characterises interglacials occurring over the past 500,000 years.

The British terrestrial sequence is of high enough temporal resolution to allow the impact of the MBE on interglacial climates to be investigated. To this end, climatic reconstructions from interglacial episodes of the early Middle Pleistocene, or the Cromerian Complex in the British stratigraphic nomenclature, are compared with climatic reconstructions from interglacial episodes of the late Middle and Late Pleistocene (MIS 5e, 7, 9 and 11). These climatic reconstructions are based on a large number of climatic proxies including soils, isotopes, beetles, plant macrofossils, molluscs and vertebrate remains. This study represents a review of work by a large number of authors whose input is acknowledged here (Danielle Schreve, Russell Coope, Jim Rose, Jon Lee, Richard Preece and Simon Parfitt).

This comparison indicates that interglacials that occurred in the early Middle Pleistocene were characterised by pronounced climate warming that was just as intense as the degree of climate warming experienced in any interglacial that has occurred since the MBE. Therefore, there is no evidence

within the British terrestrial sequence for the existence of the MBE. This conclusion has two main implications. Firstly, that whatever forcing factor is responsible for producing the MBE in records such as EPICA and SPECMAP it does not appear to be significant in controlling climates in northwest Europe. Clearly this reflects the operation of some climatic process that is specific to northwest Europe. Secondly, although the marine isotope record provides a key climatic framework for understanding the stratigraphy of regions such as northwest Europe, it is evident that there is no simple 1 to 1 relationship between the intensity of peaks/troughs in the marine isotope record and the intensity of warming/cooling of climates in regions such as Britain.

Star Carr in the New Millennium: Recent excavations

Chantal Conneller[1], Nicky Milner[2], Barry Taylor[3]

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3. University of Manchester

Since 1975 archaeological and palaeoenvironmental survey in the Vale of Pickering, North Yorkshire, has provided a landscape context for Star Carr. This work reveals relatively ephemeral Final Palaeolithic and Long Blade occupation. By contrast in the Early Mesolithic the Vale of Pickering appears to have been a busy, familiar landscape that was repeatedly returned to (Conneller and Schadla-Hall 2003). The work has revealed numerous small-scale activity areas on the lake edge – places that were frequently revisited, but for very different purposes - but nothing that resembles Star Carr. These other sites lack the antler frontlets, barbed points and beads that characterise Star Carr, leading a number of recent commentators to label Star Carr a 'ritual site' (e.g. Chatterton 2003).

In 2004, excavations recommenced at Star Carr in order to reassess the site in light of these findings. This work has sought to discover the extent of distribution and the depositional context of the rare organic objects and their relationship with the timber platform discovered during small scale excavations in 1985 and 1989. The second main objective of the project is to characterise the nature of the occupation of the dryland areas. Previous excavations have either focused on the waterlogged lake margins or been too small in scale to adequately interpret dryland activities.

This paper will report on the findings of the past five seasons of fieldwork. Relatively large-scale excavations on the dryland have been extremely productive in understanding activities at the site and their relationship to wetland areas. This paper will particularly focus on the exciting new find of the 2008 season. Excavations in the wetland areas have elucidated contexts of deposition, uncovered new organic artefacts and refined our understanding of the extent and nature of wetland deposition. The timber platform has been further uncovered and the temporality of occupation refined with new radiocarbon dates on worked antler.

One important result of the new excavations has been an understanding of the serious deterioration of the organic remains at the site. Wood, bone and antler are all very poorly preserved. The sediments have become highly acidic (as low as pH2.9) and seasonal fluctuations in water level have been found to be collecting and concentrating sulphates at the level of the organic artefacts. What stated as a research excavation has now become an effort to rescue as much information as possible as soon as possible before the organic remains are lost for good.

Star Carr has long been one of Europe's best known Mesolithic sites. However, because the excavations were relatively early, we have lacked the detailed sort of spatial information that would be ordinarily collected today. As a result, little can be determined about the nature of the site, given the fact it is the product of numerous reoccupations (Mellars and Dark 1998). This project attempts a work of 'palethnography' and aims, ultimately, to provide rich detail on social life at Star Carr that can match Petra Dark's work on the environmental milieu. We hope that in the new millennium this project will permit Star Carr to continue to live up to its famous name.

References:

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Conneller, C. and Schadla-Hall, T. 2003: Beyond Star Carr: the Vale of Pickering in the tenth millennium BP, *Proceedings of the Prehistoric Society* 69, 85-105.

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The environment of early humans in England: what the beetle saw.

G. Russell Coope

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Remains of Coleoptera (beetles) are often abundant in Quaternary organic sediments and can provide valuable information about local Palaeoenvironments and Palaeoclimates. The beetles from many sites in southern England have been investigated and four of these in which members of the AHOB team have been involved will be highlighted here. These beetle assemblages contribute to our understanding of the environment in which early humans lived.

Saham Toney, West Norfolk. At this site glacial deposits overly temperate interglacial ones dating from MIS 5e. Both yielded beetle remains. The assemblage from the glacial sediments included numerous cold adapted species some of which are now confined to arctic and continental Asiatic regions. The palaeotemperatures indicated by the beetles show that mean July temperatures were somewhere between 9°C and 11°C and mean January/February temperatures somewhere between -27°C and -23°C. It is significant to note that similar temperatures occurred at nearby Lynford when neanderthalers were exploiting mammoths (*Boismier* Bosemier *et al*. 2003). Since the landscape at the time was treeless and thus lacking in fuel, it is tempting to view the human population as migratory, visiting the northern limits of their ranges during the summer months only.

The interglacial deposits indicate a thermal climate a few degrees warmer than that of the present day. At this time the beetles from other sites of the same age indicate that sea level was several metres below that of today making the absence from England of humans during this interglacial all the mere puzzling.

Hoxne, Suffolk, One of the most significant strata at Hoxne is the "Arctic Bed" that overlies the MIS 11, interglacial lacustrine sequence. It has been argued that the apparent return to temperate conditions is merely a reflection of reworking of pollen from the interglacial deposits below (West

1956). The beetles clearly indicate cold conditions with mean July temperatures between 10°C and 11°C and mean January/February temperatures between -12°C and -10°C. This beetle assemblage is almost identical to the one from Quinton near Birmingham where it is overlain by temperate deposits with a beetle fauna that cannot have been reworked from below (Coope & Kenward 2007). Thus the Hoxne arctic bed appears to represent a real climatic oscillation rather than a redepositional artefact.

Happisburgh, locality 3. Norfolk. A rich beetle assemblage has been obtained from the same deposit that is yielding flint artefacts. The palaeoenvironment is of a mature river flowing through reed beds with mixed conifer and deciduous forest nearby. The thermal climate at the time was at least as warm as today during the summer and slightly cooler during the winters. However, the rarity of dung and carcase beetles in this assemblage suggests that most of the human activity was at some distance from the investigated site.

Ostend, Norfolk. A small sample of the "Arctic Freshwater Bed" yielded beetles, molluscs and mammals. The beetles included at least three exclusively northern species that live today no nearer than the coasts of arctic Russia. They indicate that the Mean July temperature lay somewhere between 9°C and 11°C and mean January/ February temperatures between -38°C and - 10°C. Unfortunately there is now evidence yet of any human presence.

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Coope, G.R. & Kenward, H.K (2007), Evidence from coleopteran assemblages for a short but intense cold interlude during the latter part of the MIS 11 Interglacial from Quinton, West Midlands UK. *Quaternary Science Reviews.* 26, 3276-3285

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Evidence of the first human settlements during the Lower and Middle Pleistocene in the alluvial formations of the Middle Loire Basin (Région Centre – France)

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The middle Loire basin constitutes, on a surface of approximately 40,000 km², the south part of the Parisian Basin. The Loire and all of its tributaries meet in this area, after their exit of the Massif Central.

The alluvial deposits of this area were archaeologically surveyed for more than 30 years and many prehistoric industries, of the Early and Middle Palaeolithic, have hence been discovered and studied. The alluvial terraces were located by prospection; a structural test hole was made just until the substratum. Sampling was then performed for mineralogical, geochronological and palaeoenvironnemental studies. They were replaced in their topographic, geological and structural context. Although the valley incisions appeared different from a river to another, depending on the nature of the substratum and the ancient or recent tectonic, about ten of them formed during the glacial-interglacial cycles. In the Creuse, Cher and Loir valleys, these formations are dated, by the ESR method applied to optically bleached alluvial quartz, to the Lower and Middle Pleistocene.

Five prehistoric sites with lithic artefacts linked to a very ancient immigrating settlement, are associated to the higher alluvial terraces. The ESR age of these approximates to 1.1 Ma. The two most important sites,

those of "Pont-de-Lavaud" (Eguzon-Chantôme - Indre) and "La Terre-des-Sablons" (Lunery-Rosières - Cher), are currently excavated and studied.

There is human presence at the end of the incision, at the beginning of the glacial period, before or after a very cold aggravating intermission. Humans used materials found locally for fairly opportunistic flaking. Technical behaviours fit within the range of those observed in Europe, in terms of flaking, between 1.3 and 0.8 Ma.

The industries with handaxes of ancient Palaeolithic appear in layers culminating at + 25 / + 20 m of relative height, dated between 700 and 600 ka. They are then archaeologically in place on the base and at the top of each of the lower layers stepped on the slopes. The supplies in flint become systematic and are sourced out from very important Cretaceous deposits. The presence of industries with bifacial tools opens debate as to the emergence of Acheulian type strategies as early as 0.7 Ma.

Presently, there is no clue relating to prehistoric industries in the intermediate terraces, which leads to suggest that the geographic centre of France (47°N) would have been populated in two waves separated by a hiatus of 400 ka.

Improving the radiocarbon dating of the Middle to Upper Palaeolithic transition in Europe

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A reliable chronology is one of the keys to understanding the nature of the transitions from the Middle to Upper Palaeolithic. Without this, the challenge of understanding the nature of the interaction between Neanderthals and anatomically modern humans as the former neared extinction becomes very hard to resolve. A great deal of work in Oxford over the last 5 years has been aimed at improving the situation. In this talk I will outline some of the archaeological and methodological challenges involved and present some initial results.

The work is part of a 3 year NERC-funded project concerned with the chronology of the transition. We concentrated initially on redating the corpus of British Middle and Upper Palaeolithic material using an ultrafiltration method that allows improved purification of extracted collagen from archaeological bones. We then extended this work to the continent and have been dating further material of Palaeolithic age from over 50 sites in Italy, France, Germany, Spain, Belgium, Greece and Britain. Further developments to our current methods are proposed and will be outlined.

Humans and animals in the Lateglacial of England and Wales

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With the support of AHOB and NERC we have begun to look again at the history of humans and animals in the Lateglacial of the British Isles. For humans we distinguish two clear periods of colonisation with between them a time of human absence corresponding to the Younger Dryas Chronozone. The colonisation events correspond to the Final Magdalenian and to the Terminal Palaeolithic 'long blade technologies'. There is the merest hint that Mesolithic colonisation is a separate event from that of the Terminal Palaeolithic.

For the animals, interest has largely centred on the extinction of the some of the more spectacular Pleistocene species. While radiocarbon dates are still very few we begin to see biostratigraphic patterning amongst some of the commoner species during the Lateglacial.

The talk includes brief discussion of work in progress and further intentions.

Geometric Morphometric Analysis of *Microtus* remains: Preliminary Results

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The preserved remains of the genus *Microtus* form a common component of faunal assemblages in Pleistocene sediments and are found in a wide variety of depositional environments across Europe. These remains are used in the reconstruction of past environments and climates, and in order to date sites using biostratigraphic methods. Voles are considered to be one of the most rapidly evolving mammals over the past 1mya, which can be reflected in changes in the shape of the enamel in the lower first molars (M_1). Traditionally, separation of species and changes within species throughout time have been suggested largely upon the most variable region of the tooth, the anteroconid complex *(*van der Meulen, 1976).

The application of Geometric Morphometric analysis represents a new approach to the analysis of *Microtus* remains, allowing the complex quantitative analysis of shape change, details of which are not easily identified using standard morphometric analysis, which rely upon linear measurements, or qualitative suggestions of shape change.

Geometric Morphometric analysis of modern comparative specimens has shown that species can be separated successfully when the anterior cap is excluded from analysis, suggesting a much greater degree of variation in the posterior region of the tooth than previously thought. This may allow damaged specimens from archaeological sites to be identified accurately, even when the anteroconid complex is missing.

Geographic variation within modern *Microtus* has also been investigated, with results suggesting that a strong geographic signal is present within the shape of the teeth which has potential for identifying introduction and re-introduction events of *Microtus* into the British Isles, and movements of *Microtus* populations elsewhere.

La Celle: one of the oldest Acheulean settlements from Northern France during an Interglacial period (MIS 11).

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Recent investigations on morphology and biostratigraphy have been undertaken on La Celle calcareous tufa located at some 80 km south-east of Paris in the Seine valley (Northern France). The site is famous since the 19th century as a Middle Pleistocene Interglacial witness rich in shells and leaf prints, but was never dated properly nor studied in detail. Incidently several dozens of handaxes were also collected. Although not precisely located in the stratigraphy they were said to come from the tufa. This industry was allocated by ancient authors to the Early Acheulean culture. New research, based on a multiproxy approach, was primarily focused on dating of the formation together with precise palaeoenvironmental and climatic reconstructions. New created sections allowed detailed sampling for several proxies and led to the discovery of an archaeological level yielding flint artefacts associated with mammals bones. First results show that the tufa edificated downwards the slope reaching a total thickness of 8 metres high. The molluscan succession recovered from the upper silty fluvial unit and the base of the tufa describes the transition from a Lateglacial open landscape to the open forest environment of an Early Interglacial period. The middle part of the tufa yields assemblages of closed forests corresponding to a climatic optimum. At the top of the calcareous deposit, malacofaunas reflect a dramatic decrease of forest species. Flora described after revision of ancient leaf print collections corresponds to interglacial conditions and

includes several mediterranean taxa (*Ficus, Buxus, Celtis*) which were unknown in this area. The climatic optimum is identified in a grey organic tufa layer that has yield the mammal remains and the lithic artefacts. The temperate mammal assemblage including *Hippopotamus* and *Macaca* genus, reinforces the climatic interpretation deduced from molluscan data. The few flints artefacts recovered in the same layer, allow to identify a bifacial industry and demonstrate occurrence of a human settlement. From malacological arguments, morphological position of the deposit within the Seine valley terrace system and radiometric dates, the deposit is allocated to MIS 11. Thus la Celle appears as one of the oldest site with bifacial industry in Northern France.

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Glacial Chronologies Spanning the Past 450 ka Around the Margins of the Southern North Sea and implications for the age of the Strait of Dover

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The role of the British and Scandinavian ice sheets in glaciation of the southern North Sea region during Marine Isotope Stage (MIS) 6 has recently been linked to the separation of Britain from continental Europe and a catastrophic flooding origin for the Strait of Dover. This mechanism has also been considered the most likely cause for the failure of Humans and a number of other mammals to re-colonize Britain during temperate-climate MIS 5e after a period of some c. 500 kyr when they had been present during temperate climate episodes. However, there has been a lack of supporting data about the extent of glaciation during MIS 6 or indeed in other Middle Pleistocene cold stages in Britain, with previous interpretations ranging from a single Anglian Stage advance, to multiple-stage models involving glacial advances that extended outside of the LGM limit in several Middle Pleistocene cold stages. In order to develop an improved chronology for the glacigenic sequences, over 80 samples have been collected from glaciofluvial, glaciolacustrine, and shallow-marine deposits for optical stimulated luminescence (OSL) dating with the approach of obtaining 5-10 replicate dates per stratigraphical (time synchronous) unit. The OSL ages indicate that the most extensive Anglian Glaciation can be correlated with MIS 12 (427 ± 26 ka BP). A second cluster of ages at 166 ± 8 ka BP also indicate that major ice advances occurred broadly synchronously in the UK and Netherlands during MIS 6, although the dimensions of the ice sheet in

Britain appears to be of a similar or lesser extent to that of the LGM, whilst the MIS 6 glaciation of the Netherlands was much more extensive. In addition, OSL ages constrain the age of shallow-marine sediments in northern France to MIS 9, therefore the Strait of Dover must have been eroded by a glacial lake outburst during MIS 10 or MIS 12. This suggests that the absence of Humans during MIS 5e in Britain is not due to the initial destruction of the land-bridge formerly connecting Dover to Northern France as this must have been destroyed in an earlier glaciation and implies a more complex cause.

Mammal associations in the Pleistocene of Britain: Implications of Ecological Niche Modelling

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The fundamental niche of a species can be thought of as existing in a multivariate space in a hypervolume whose axes are the variables relevant to the life of the species, the boundaries of the niche being defined by the range of values on each variable that permit the species to exist in the absence of competition (Hutchinson, 1958). If the variables that limit the existence of the species are ultimately climatic, then the "climate envelope", or the range of climate found across a species geographic range, of a species is a good proxy for its fundamental niche (Peterson, 2001). The ideas of fundamental niche and climate envelope are implicit in the notion of disharmonious faunas, those Pleistocene faunas with species coexisting that today live in allopatry (Lundelius, 1989). Disharmonious species combinations are conflicting indicators of palaeoenvironment and they imply that environments in the past differed such that those species could coexist in the same location even though they cannot today. This interpretation rests on the logic that the climate at a locality with a disharmonious fauna falls within the tolerances of the disharmonious species, but has a different combination of climate parameters than exists today (Jackson and Overpeck, 2000). The concept of disharmonious faunas thus implies (1) that species found in association in the past should have overlapping climate envelopes, even when they don't have overlapping geographic ranges; and (2) that the palaeoclimate ought to be predictable from the degree of overlap in the climate envelopes of its constituent fauna, regardless of whether there are disharmonious species or not. These principles form the basis of previous methods for reconstructing palaeoenvironment from species associations (Hokr, 1951; Atkinson *et al.*, 1987) and for this study.
Based on their modern habits, we chose four cold-weather species (*Alopex lagopus*, *Lemmus lemmus*, *Ovibos moschatus* and *Rangifer tarandus*), three

warm-weather species (*Crocuta crocuta*, *Panthera leo*, and *Hippopotamus amphibius*), and three generalist species (*Arvicola terrestris*, *Cervus elaphus*, and *Sus scrofa*) for analysis. We used the WorldClim dataset of 19 climatic variables, all of which are different measures of temperature and precipitation (Hijmans *et al.*, 2005), to characterize climate the climate envelopes of these species. We standardized the distribution of climate values on each variable to calculate the probability of occurrence of the species for any given value and used a maximum-likelihood function to estimate the most likely climate for a site given the species found in association there.

Twenty-two of the possible 45 pairs of species live allopatrically today and twelve pairs have climate envelopes that do not over lap. *Crocuta crocuta* and *Hippopotamus amphibius* have do no overlap climatically with *A. lagopus*, *O. moschatus*, *R. tarandus*, and *L. lemmus*, and *P. leo* does not overlap with *O. moschatus*. All of the associations found in the Pleistocene sites were consistent with their modern ecological niches, except seven associations between *C. crocuta* and *R. tarandus* (an association that has been verified to be real in MIS 3) and one between *C. crocuta* and *L. lemmus*. Most likely the modern geographic range of *C. crocuta* does not accurately reflect the range of climate conditions in which this species flourished in the past. Climates reconstructed for Pleistocene sites varied in their plausibility. For example, the Joint Mitnor Cave fauna (MIS 2) was estimated to have a mean annual temperature of 2º C, annual precipitation of 633 mm, and a very high seasonality; Bleadon (MIS 4), however, was estimated to have a mean annual temperature of 28º C, annual precipitation of 336, and low seasonality. The high temperatures estimated at many sites that were probably cooler in reality are due to the presences of *C. crocuta*, which lives exclusively in warm climates today but probably did not do so in the past.

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The AHOB database

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The AHOB database records archaeological, faunal, age, and other information about sites studied during the project. To date, information about 272 sites have been recorded and more are being added as work progresses. The main source of data comes from direct contributions by AHOB researchers, though some effort has been made to track down information from publications listed in the annual project reports. General information about each site, including a short description and National Grid coordinates are available for each site. Archaeology is recorded simply as the lithic industry, if any, present at a site. Fauna is recorded as species lists: 202 species, mostly mammals, are currently found in the database. Age assessments for each site are also available, including Mammal Age Zone (MAZ), Marine Isotope Stage (MIS), and radiocarbon dates are recorded where applicable. The source of all data that is entered is recorded in the database, preferably a published source. Technically speaking, the database is kept in two formats: a Microsoft Access version is capable of being stored on individual computers and a mySQL version is capable of being queried over the internet. A web interface has been written for the internet version that allows data to be browsed and cross-referenced. Raw SQL queries can also be made to the mySQL server. Until the project ends, the database is available only to project members by request to David Polly or by login and password through the members part of the AHOB website. When the project ends the database will be made publicly available at http://AHOBProject.org/.

Biostratigraphic and aminostratigraphic constraints on the Middle Pleistocene glacial succession in north Norfolk and its relevance for Palaeolithic archaeology

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Considerable debate surrounds the age of the Middle Pleistocene glacial succession in East Anglia following some recent stratigraphical re-interpretations (e.g. Lee et al., 2004). Resolution of the stratigraphy here is important since it not only concerns the glacial history of the region but also has a bearing on our understanding of the earliest human occupation of NW Europe at sites like Pakefield and the first appearance of hand-axe industries in this region. The orthodox consensus that all the tills were emplaced during the Anglian (MIS 12) has recently been challenged by a view assigning each major till to a different glacial stage, before, during and after MIS 12. Between Trimingham and Sidestrand on the north Norfolk coast, datable organic sediments occur immediately below and above the glacial succession. The oldest glacial deposit (Happisburgh Till) directly overlies the 'Sidestrand *Unio*-Bed' of the Cromer Forest-bed Formation. Dating of these sediments therefore has a bearing on the maximum age of the glacial sequence. The palaeobotany and faunal assemblages recovered from the Sidestrand *Unio*-Bed indicate accumulation in a fluvial environment in a fully temperate climate with regional deciduous woodland. There are indications from the ostracods for weakly brackish conditions. Significant differences are apparent between the Sidestrand assemblages and those from West Runton, the type site of the Cromerian Stage. These differences do not result from contrasting facies or taphonomy but reflect warmer palaeotemperatures at Sidestrand and a much younger age. This conclusion is suggested by the higher proportion of thermophiles at Sidestrand and the

occurrence of a water vole with unrooted molars (*Arvicola*) rather than its ancestor *Mimomys savini* with rooted molars. Amino acid racemization data also indicate that Sidestrand is significantly younger than West Runton. These data further highlight the stratigraphical complexity of the 'Cromerian Complex' and support the conventional view that the Happisburgh Till was emplaced during the Anglian rather than the recently advanced view that it dates from MIS 16. Moreover, new evidence from the Trimingham lake bed (Sidestrand Cliff Formation) above the youngest glacial outwash sediments (Briton's Lane Formation) indicates that they also accumulated during a Middle Pleistocene interglacial, probably MIS 11. All of this evidence is consistent with a short chronology placing the glacial deposits within MIS 12, rather than invoking multiple episodes of glaciation envisaged in the 'new glacial stratigraphy' during MIS 16, 12, 10 and 6. The pre-glacial provenance of a hand-axe found at Sidestrand in 1922 remains uncertain but hand-axes from beneath the Happisburgh till are now known from two sites at Happisburgh itself. The Happisburgh till overlies the archaeological horizon at Happisburgh 1 with a fresh hand-axe and *Arvicola.* Our reinterpretation of the age of the glacial succession now removes the need to invoke an anomalously early pre-MIS 16 hand-axe industry in Norfolk.

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Continuities and discontinuities in Neandertal presence – a closer look at northwestern Europe

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The Neandertal lineage was the first hominin group to extensively colonize the middle latitudes of Western Eurasia up to 55° N. Although Neandertals were able to adapt to a variety of environments, their ability to cope with extreme glacial environments seems to have been limited. Depending on the climatic cycles, their presence in the northern environments was essentially discontinuous, as shown very well by the archaeological record of their presence and absence in northern France (e.g. Tuffreau 2001; Goval 2008; Depaepe in press). The pattern of periodical abandonment of these northern areas is generally interpreted as resulting in a movement of northern populations into southern refuges, followed by a subsequent re-colonization of the northern regions from these core areas. Here, I will argue that the current palaeo-ecological, archaeological and palaeo-genetic evidence support an alternative interpretation, that of repeated local extinctions (cf Hublin and Roebroeks, submitted).

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Palaeophylogeography of British *Arvicola* (water vole) since the last glacial period

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Phylogeographies of British water vole, based upon mitochondrial DNA (mtDNA) from modern populations (Piertney et al., 2005), indicate the presence of two distinct lineages:

• A Scottish group closely related to Swiss and French populations

• An English and Welsh group more closely related to Scandinavian *Arvicola* than to those of the Scottish group

This evidence suggests a double recolonisation of the British Isles occurred following climatic amelioration at the end of the Last Glacial. This pattern is compatible both with the generally accepted paradigm of faunal dispersal from southwestern and southeastern European glacial refugia (Taberlet et al., 1998) and the cryptic northern refugial hypothesis (Stewart & Lister, 2001). A growing body of evidence indicates that inferences based solely on modern faunal distributions mask historical phylogeographic complexity (e.g. Barnes et al., 2002); complexity that can provide valuable evolutionary, palaeoecological and palaeogeographical insights. This poster investigates within-species phylogenetic and geographic patterns in *Arvicola* from the Last Glacial to the present day, with particular attention on the recolonisation of the British Isles. Specific questions concern:

• Were modern mtDNA lineages sympatric at any time? If they did possess a common distribution when and why did the current allopatric patter develop?

• Do palaeophylogeographies of *Arvicola* support a specific model of postglacial recolonisation?

• Are there any implications for the biostratigraphic use of *Arvicola*?

Modern and fossil *Arvicola* from the western Palaearctic were analysed together.

Between population relationships were assessed through statistical analysis of molar tooth shape using the methodological toolkit of Geometric

Morphometrics (e.g. Polly, 2001). Comparison of genetic divergence and morphological distance shows that tooth shape records phylogeny well. Eastern and western European phylogeographic groups are evident in morphological phylogenies of modern populations. The introduction of fossil populations to the analysis allows temporal changes in the geographic distribution of lineages to be followed. These phylogeographic patterns are discussed and contrasted with a traditional metric of evolution in *Arvicola* the enamel thickness quotient (SDQ).

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Early Palaeolithic occurrences in the Haine region (Belgium). Some trends in lithic technology

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The Haine region is one of the richest regions of early Palaeolithic sites in Belgium. In this talk we will address the question why this is the case. We will also discuss some important changes in the lithic technology starting with the Early Palaeolithic of Pa d'La L'iau and Petit-Spiennes and the Middle Palaeolithic assemblages of Mesvin IV, Carrière Hélin and Le Rissori.

The view from the edge; a British perspective on the Early Middle Palaeolithic of north-west Europe

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This paper explores the regional context of Early Middle Palaeolithic Britain as the north-westernmost edge of the European landmass between MIS 8-6. During this period, Levallois flaking became favoured as a problem solving strategy in north-west Europe, and although it is possible to delimit ways in which Levallois flaking arose in response to particular local conditions (White and Ashton 2003), it is also intriguing to consider how and why this technological system came to replace the Acheulean tradition which had dominated most previous interglacial intervals. Within Britain, the dominance of Levallois flaking is arguably linked to new ways of exploiting landscapes from late MIS 8/7 (Scott 2006); here we explore the relationships between the British and mainland European records, and how and why Levallois flaking became so popular a technological strategy. The area reviewed is limited to the "north-west region" of Europe (as defined by Gamble 1986, 61). We present no easy or clear-cut answers, but rather, would like to raise some questions for discussion, namely;

- How universal is the pattern of dominant Levallois flaking apparent in the Thames Valley during the earlier Middle Palaeolithic?
- Why can so few north-west European sites be assigned to fully temperate intervals within MIS 7?
- Most British early Middle Palaeolithic sites can be assigned to the earlier part of MIS 7, whilst most continental assemblages are dated to the latter part – what does this pattern relate to?

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Early Middle Pleistocene landscapes of Suffolk: An update on the Environmental Archaeology of Flixton Quarry.

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This presentation will update and report on the ongoing investigation into the early hominin occupation and associated Cromerian landscape as recorded at Flixton Quarry (RMC Aggregates Ltd Site, TM 2956 8643), an (*ca.*1km^2) active sand and gravel quarry in Suffolk, East Anglia. Fossiliferous sediments were initially exposed at the site in early 2007. Sedimentological analysis indicates that the organic unit is likely to have formed as a pool infill at the base of a large bar (mega-ripple) by tidal current flow in a shallow marine context (cf. Wroxham Crag). Rich palaeoenvironmentalevidence has also been collected and analysed and ongoing investigations have revealed evidence for a temperate climate, with a mosaic landscape of woodland and open grasslands (pollen and plant macrofossil analysis), inhabited by a diverse faunal assemblage (including small mammals, occasional large mammal remains, fish and beetles). The presence of early humans is inferred from a rich assemblage of more than 200 artefacts to date, all in exceptionally fresh condition, *in situ* in association with the channel.

The European fossil human record and its relevance to AHOB

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The Eurasian fossil human record has not grown greatly in the last five years, but interpretations of that record are evolving rapidly, with relevance to AHOB over several time periods. Further study of the Dmanisi fossils, and comparisons with material from Atapuerca and Flores, are leading to some radical rethinking about the nature and timing of the first human dispersals from Africa. In this view, the absence of fossil human evidence from Asia older than Dmanisi is indicative of a lack of preservation and recovery, rather than a real absence. It has been proposed that there was a widespread late Pliocene phase of human evolution in Eurasia which is only represented today by the isolated Dmanisi and Flores fossils (Dennell & Roebroeks 2005). Further finds, and reinterpretation of the Atapuerca *antecessor* material, have also increasingly related these to the Dmanisi specimens and to Asian *Homo erectus*, while distancing them from African finds and the ultimate origins of *Homo sapiens* (Bermúdez de Castro et al. 2008; Carbonell et al. 2008). When the new Sima del Elefante material (~1.2 Ma) is combined with emerging archaeological evidence and faunal comparisons, these suggest that southern Europe could have been colonised from western Asia not long after the time of the Dmanisi sample.

It is assumed that the early human inhabitants of Happisburgh 3 and Pakefield had dispersed or expanded from southern Europe, and could thus have represented evolving elements of the *antecessor* clade. I have previously been cautious about the status of *antecessor*, arguing that it might represent a variant of an already-known species such as *Homo heidelbergensis*, or "*Homo mauritanicus*". Now, I am much more prepared to recognise its validity, based on its extended time range and distinctive morphology. However, I am less sure about the later course of events, as I doubt that the *neanderthalensis-sapiens* divergence has the deep antiquity inferred in some recent rethinking (see e.g. Stringer 2002; Weaver et al. 2008). Also I consider (with Bruner & Manzi 2007) that the Ceprano calvaria

(sometimes assigned to *antecessor*) could relate to subsequent European *and* African fossils that I have assigned to *heidelbergensis,* thus contradicting the idea of a deep separation between the European and African lineages leading, respectively, to Neanderthals and *sapiens*.

However, support for a deep Neanderthal-*sapiens* split also comes from new age estimates for the extensive Atapuerca Sima de los Huesos sample of >530 ka (Bischoff et al. 2007). This potentially places the hominin fossils in pre-MIS 12 (=preAnglian?) times, not only considerably older than Swanscombe, but also much older than any other European fossils that show comparable levels of "neanderthalisation". However, it is still unclear (to me) whether whole bodies were deposited in the Sima, followed by formation of the dated flowstone, or whether the remains could have been redeposited from elsewhere in the cave, in which case could one or more mudflows or collapses have injected the fossiliferous breccias at a later date? Regardless of the resolution of these complex issues, it would be valuable to attempt further dating of material in the deposits themselves to help determine whether their age is comparable with that of the flowstone, as well as to further refine biostratigraphic comparisons of the fauna.

For the Neanderthal-modern transition much new chronological data have been added, including refinements from the increasing use of ultrafiltrated radiocarbon dating. Some archaeological research on the transition is adding complexity, and there is also a growing conflict in interpretations of the fossils – do they show assimilation at work, or do they (in line with emerging genetic data) suggest the absence of significant interbreeding between Neanderthals and early modern humans? In my view we not only need to focus in on the Middle-Upper Palaeolithic transition in Europe, but also to broaden our perspectives to look at the relationship of these two allotaxa/species over a wider range of time and space.

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Recent fieldwork at Kesselt-*Op de Schans* (Limburg, Belgium): Preliminary results

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During the last decades, commercial loam exploitation in Dutch and Belgian Limburg led to the discovery and excavation of several Middle Palaeolithic sites and enabled the construction of a robust regional chronostratigraphic framework. Recent investigations in the brickyard quarry of Kesselt-*Op de Schans* have demonstrated the presence of four small clusters of lithic artefacts in primary context. They are dispersed on the same old land surface which can be attributed to the transition MIS9/MIS8. The geomorphological evidence suggests comparatively fast sedimentation rates for the layers bracketing the archaeological level and, therefore, the identical stratigraphic positions of the clusters indicate contemporaneity.

These conditions allow the generation of high resolution spatial and technological data, demonstrating the presence of a limited number of partial and nearly complete reduction sequences. Technological analysis and conjoining evidence support the presence of different technological strategies, comprising simple prepared core and discoid methods, alongside the occurrence of Levallois flakes and flakes with *chapeau de gendarme* butts. These assemblage constellations solicit a reflection on the organisation of production activities in early Middle Palaeolithic times and on the nature of lithic variability.

Biogeography as a context for human dispersal

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For decades it has been the predominant opinion that human origins are in Africa and that *Homo* dispersed from there into Eurasia. There are many studies which intent to relate the dispersal of early humans from Africa into Europe to the dispersal of a particular species or to a dispersal event, but usually no attempt is made to study this event in the wider context of the history of faunal exchange and biogeography in relation to environmental change.

The known fossil and archaeological record indicates human origins in Africa, with a dispersal of primitive humans with primitive technology into Eurasia around 1.8 Ma ago. This occurred against a background of decreasing faunal exchange between Eurasia and Africa, since about 2.5 Ma. The few mammals that dispersed after about 1.8 Ma to or from Africa tend to be herbivores adapted to dry environments and carnivores. This pattern of decreasing faunal exchange is probably related to an increase in aridity in the Middle East and North Africa (deMenocal. 1996).

Primitive *Homo* with primitive industry is found in Dmanisi, together with a fauna with predominant European affinities, as well as in south and east Asian localities of roughly similar age. However, it seems that human dispersal into Western Europe is much later. It is not uncommon that mammals were present in the area around the Black Sea for millions of years before dispersing into Western Europe. This occurred in the Miocene, Pliocene and Pleistocene. Human dispersal into Western Europe may have occurred as late as 1.2 Ma ago, which means a lag of some 0.6 Ma. Climatic and vegetational zones extend east - west over much of northern Eurasia. Faunal dispersals along these zones are expected, and in fact most species that arrived in western Europe seem to have Asian affinities. Some westward dispersals of east Asiatic species may have occurred around the time that *Homo* appeared in Europe. When most of this happened, Mode 2

or Acheulean existed already, but does not seem to have made it far into Eurasia. Around 0.5-0.6 Ma ago the Acheulean and *Homo heidelbergensis* appeared in Europe. This seems to be shortly after a limited faunal exchange between Africa and Eurasia, while faunal exchange across mid-latitude Eurasia was continuous.

Possible causal relations between faunal events and human dispersal could explain certain phenomena, but raise further questions.

Environments of Lateglacial human occupation at Sproughton; occupation of a bar surface and new work on the laminated sediments.

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Sproughton is an archive of Lateglacial environments and human activity. New and previous work has highlighted what now appears to be up to 4 separate phases of human occupation. These 4 phases and associated artefacts are 1) – barbed points of antler and bone deposited in fluvial gravels and dated by R. Jacobi and T. Higham for AHOB II to (OxA 15219) - 10,960 ± 50 (antler) and (OxA 14943) - 11,485 ± 60 respectively (pers. comm). 2) Long-blade types deposited within a yellow sand and pedogenically altered brown sand unit which developed on the surface of the yellow sand. This sand is believed to be late GS-1 (Younger Dryas) to Early Holocene in age. 3) Long-blade and Upper Palaeolithic artefacts which appear to have been modified in some way at a later date (due to patination), possibly during the Mesolithic or Neolithic and occur stratigraphically above the long blade industry in the brown sand. 4) Small Neolithic blades which occur within the overlying mid-Holocene floodplain deposits. It appears this site has been continuously utilised throughout much of the late Lateglacial and Early-Mid Holocene.

Underlying all the archaeology at the site is a calcareously laminated silt approximately up to 1m thick in some areas. This laminated unit has the potential to produce an isotopic curve for the Lateglacial interstadial (Wymer *et al*., 1975; Rose *et al*., 1980). Coring is being conducted in collaboration with the BGS. The laminated silts have now been re-located and work is underway to obtain several continuous core sequences. Preliminary data is presented from the one core recovered.

Stable isotope analysis, palynology, chemical analysis and micromorphology are being undertaken to provide a high resolution synthesis of the palaeoecology during the Lateglacial interstadial (GI -1). Radiocarbon samples have also been submitted and cores are being analysed for the possibility of micro-tephra to constrain the timings of any visible changes in palaeoenvironments and temperatures. Although there is no archaeology within this deposit, the work will provide a unique opportunity to place the prolithic archaeology at Sproughton into Lateglacial stratigraphy and may help to more fully resolve the nature and timings of the climatic shifts during GI-1 which is a significant time for the recolonisation of Britain after the Last Glacial Maxima (e.g. Barton *et al*., 2003; Blockley *et al*., 2006).

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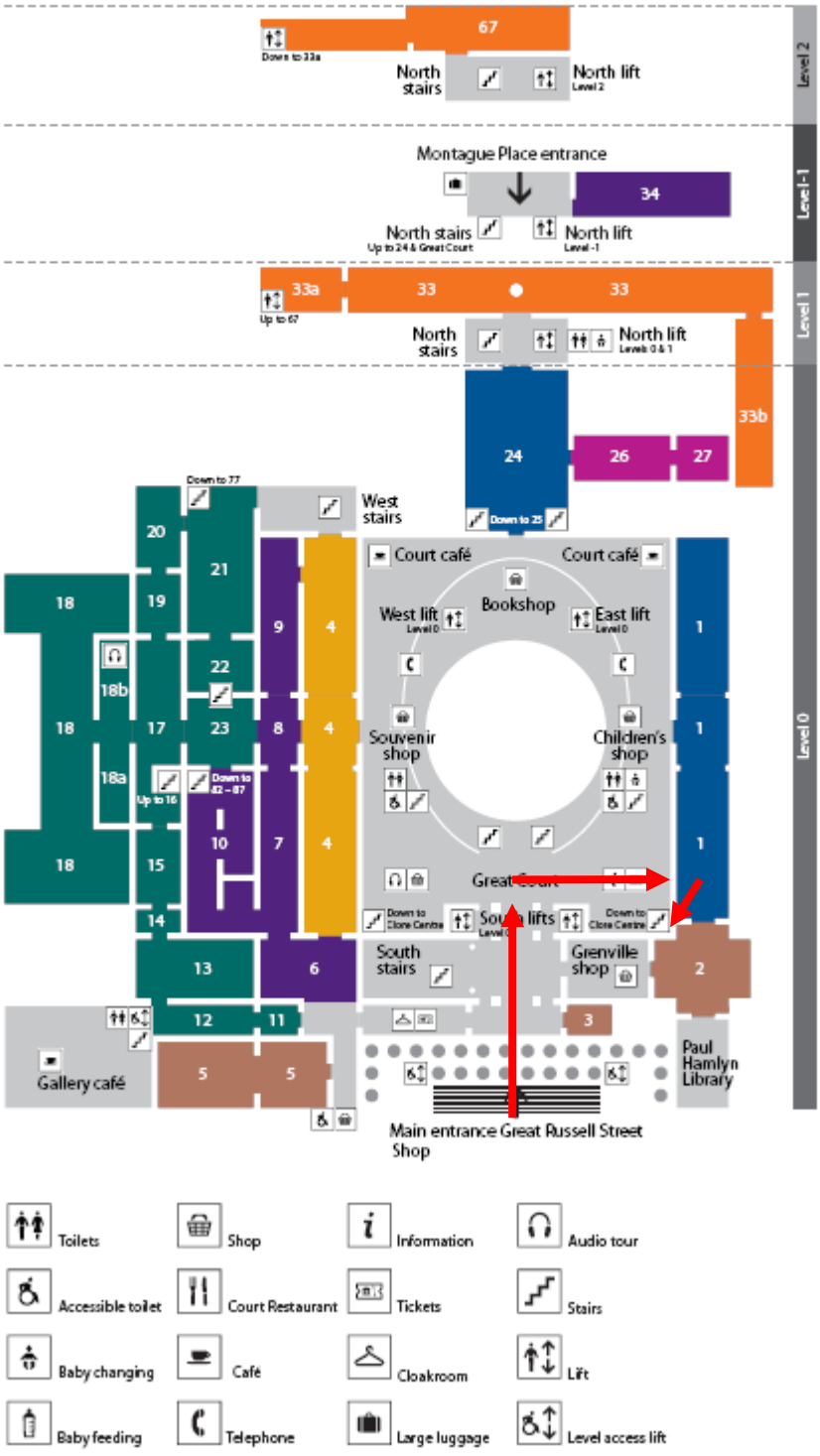
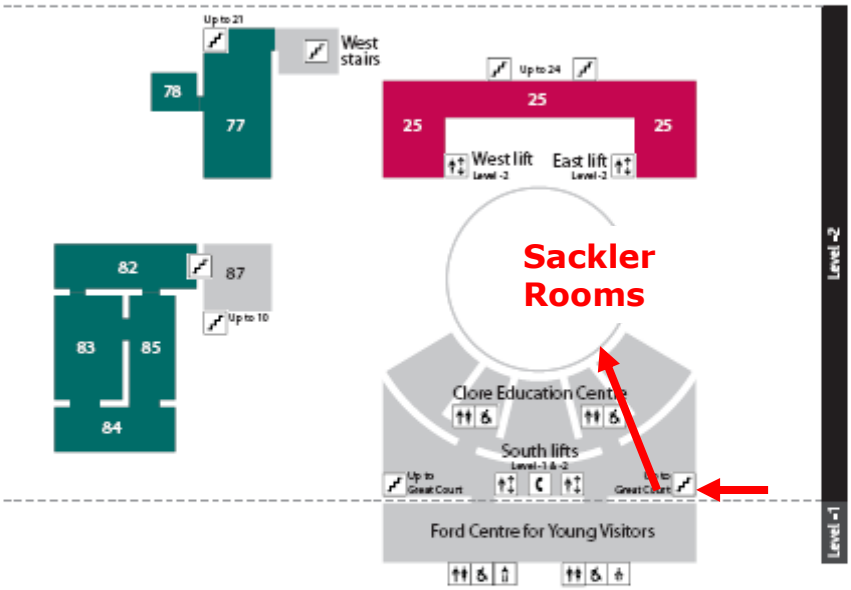
Ground floor



THE BRITISH MUSEUM

Lower floor

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