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The human occupation of Britain during the Hoxnian Interglacial

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ABSTRACT

This paper provides an overview of the MIS 11 record for Britain. The glacial history of Britain, in particular the Anglian glaciation of MIS 12, enables the identification of a number of sites that can be attributed to MIS 11. The good biological preservation at several of the sites allows correlation between them and therefore a better understanding of the chronology of the associated lithic industries. These assemblages can also in some cases be linked to the changing geographic position of Britain as sometimes a peninsula and other times an island of mainland Europe. It means that populations were colonising, retreating, or becoming locally extinct, then recolonizing as the geographic status changed. The initial colonisers seem to have lacked handaxe technology. Although this has been traditionally framed within a parochial 'Clactonian' debate, this paper suggests that it is better viewed within a European context to understand better the dynamics of population movement and the possible source areas for those populations. Equally differences in other lithic technologies, such as handaxes, can be viewed in this light. Finally, the paper suggests that within a European context, non-handaxes assemblages should be viewed as part of the technocomplex of the Acheulian and that there are many other technological and behavioural features that unite the various sites of MIS 11 Europe.

1. Introduction

The Hoxnian Interglacial of Britain has provided one of the richest records of human occupation in Europe with a wealth of sites and artefactual assemblages. In combination with improved understanding of the stratigraphic record and application of dating there is now a robust chronological framework in which to place these industries. Many are associated with environmental remains which contribute to the dating and correlation of the different sites and enable reconstructions of the human habitats. The majority of the sites are in the south and east of England, particularly in areas where there is underlying Cretaceous Chalk. Several sites lie on the former course of the Thames, such as Swanscombe in Kent and Clacton in Essex, while others are concentrated in Suffolk, such as Barnham, Elveden, Beeches Pit and Hoxne (Fig. 1).

Of importance to the stratigraphic framework are Anglian glacial sediments, which underlie several of the sites. This glaciation is widely interpreted as dating to Marine Isotope Stage (MIS) 12 (Wymer, 1985; Ashton et al., 1994, 2008; Bridgland, 1994; Preece et al., 2006; Penkman et al., 2011). In the Lower Thames, Anglian glacial till is found underlying Boyn Hill/Corbets Tey terrace deposits at Hornchurch, providing a relationship between the sites that lie on this terrace and the glaciation of MIS 12. Anglian glacial till is also found across large areas of East Anglia and many of the sites are associated with small lake basins that formed as kettle holes within the till (West, 1956; Turner, 1970; Ashton et al., 1998, 2006, 2008; Preece et al., 2006). The sediments that infilled the basins date to the following interglacial of MIS 11. It is within these various contexts that lithic assemblages survive often associated with environmental remains.

The purpose of this paper is to provide a brief description of the main sites, showing how they correlate with the marine isotope record. This provides the structure to understand the human colonisation of Britain during MIS 11, the habitats that were inhabited and to try to understand how this relates to the changes in palaeogeography and to contemporary human groups in mainland north-west Europe.

2. The palaeogeography of Britain from MIS 12 to MIS 11

Prior to MIS 12, Britain had a permanent land-link to mainland Europe with the Kent–Artois anticline running from south-east England to north-west France (Smith, 1985; Gibbard, 1995; Ashton, 2002; Toucanne et al., 2009; Ashton and Hosfield, 2010). On the southern edge of the North Sea Basin a large embayment

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stretched from East Anglia across to Belgium and the Netherlands, while to the south a similar embayment ran from Sussex across to Normandy. As ice began to melt towards the end of MIS 12, a proglacial lake built up in the southern North Sea Basin, blocked by ice to the north and Chalk to the south. When the lake level rose to above c. 30 m the water broke through the Kent–Artois anticline to create the Strait of Dover and flow into the Channel River.

This event was of upmost importance to the human occupation of Britain, as high sea-levels would isolate Britain from mainland Europe. During the Hoxnian the island status of Britain was complicated by the height of the floor of the North Sea Basin. The floor of the basin has been subsiding through time to its current depth at c. −40 m OD. Molluscan evidence from Swanscombe, Clacton and other Hoxnian sites on the Thames, shows that at times the Thames was confluent with the Rhine due to the presence of the 'Rhenish fauna' that colonised up the river systems from mainland Europe (Kerney, 1971; White et al., 2013). The combination of temperate climate and the confluence of British and European rivers indicates that the depth of the North Sea Basin at this time must have been only slightly lower than modern day sea-levels (Ashton and Hosfield, 2010; Ashton et al., 2011). The implication for humans was that dry-land access to Britain was opened up by only small drops in sea-level, while conditions were still temperate, leading potentially to a series of colonisations from mainland Europe during MIS 11.

3. The vegetational structure of the Hoxnian and correlation with MIS 11

The vegetational succession of the Hoxnian can be understood from the lacustrine sequences at Hoxne and Marks Tey (West, 1956; Turner, 1970; Table 1). The lake beds at Hoxne built up within a kettle hole in Anglian glacial till. The lowermost lake bed (Stratum F) contains pollen dominated by grasses, sedges, sea buckthorn (*Hippothae*) and some birch (*Betula*), with beetles that show a rapid change from arctic and boreal taxa to those preferring more temperate conditions (Coope, 1993). The interglacial proper started in the lake beds of Stratum E with pollen zone I (HoI) with an increase in tree-cover, predominantly of birch and occasionally pine (*Pinus*). Pollen zone II (HoII) saw the arrival of oak (*Quercus*) in HoIIa, followed by alder (*Alnus*), hazel (*Corylus*) in HoIIb and as the forest matured into the peak interglacial the appearance of yew (*Taxus*) and elm (*Ulmus*) in HoIIc. Hazel and alder dominated the vegetation of early pollen zone III (HoIIIa), but with the first appearance of hornbeam (*Carpinus*). By then the lake basin had become choked with sediment and dried out to form Alder carr. The peat that was left behind has preserved a rich beetle fauna which suggests summer average temperatures of between 15 and 19 °C (Ashton et al., 2008).

Due to the infilling of the basin, the sequence at Hoxne only records vegetational changes up to HoIIIa, but the entire interglacial sequence is recorded in the larger lake basin at Marks Tey in Essex (Turner, 1970). The bottom half parallels that of Hoxne and the sequence continues with HoIIIb and HoIIIc with the decline of hazel, oak and other deciduous elements, other than alder, but the dramatic rise in fir (*Abies*). Zone IV (HoIV) shows the decline of the mixed forest with the prominence of pine, birch and grasses.

This vegetational succession can be recognised in continuous sequences across Europe, such as the Velay sites in France (Reille and de Beaulieu, 1995; de Beaulieu et al., 2001) and that from Ossowka in Poland (Nitychoruk et al., 2005). One of the markers that makes it distinct from other interglacial is the late appearance of hornbeam, but also in much smaller numbers the nutwing tree (*Pterocarya*). Both taxa seem to recolonize from refugia in the Carpathians of south-east Europe in pollen HoIII. A further tie-point is the 'non-arboreal pollen phase' during HoIIc, which can be recognised at various sites across Europe. It seems to have been a calamitous collapse in the forest cover with the rapid replacement by grasses, ferns, heathers and mosses. Its cause is unknown, although there have been suggestions of a large meteor strike or volcanic eruption that caused a rapid climatic downturn (Candy et al., 2014).

The correlation of the Hoxnian vegetational sequence with the more continuous European records also allows correlation with the marine isotope records (Fig. 2). The isotope curves show that the structure of MIS 11 is complex with a major temperate phase (substage 11c) from c. 420 to 390 ka, followed by a series of cooler and moderately temperate phases from c. 390 to 360 ka, which have been subsumed into sub-stages 11b and 11a (Tzedakis et al., 2001). Based on recent fieldwork at Hoxne it now seems that the Hoxnian Interglacial correlates with just MIS 11c, rather than the whole of MIS 11 (Fig. 2; Ashton et al., 2008).

4. British MIS 11 sites

There are many British sites that probably date to the Hoxnian or more broadly MIS 11, but the majority of these are found in terrace gravels, particularly of the Thames and Solent rivers (Wymer, 1968; Hosfield, 1999; Ashton and Lewis, 2002; Ashton and Hosfield, 2010). However, there are six main archaeological sites that are better constrained through radiometric dating, aminostratigraphy and biostratigraphy, which are described below.

4.1. Clacton-on-Sea, Essex

Clacton has been known as a palaeontological site since the 1830s, but it was in the late 19th and early 20th century that artefacts were first recorded from the exposures of marine and

Table 1
British pollen zones and vegetational succession for the Hoxnian based on Hoxne (West, 1956) and Marks Tey (Turner, 1970) with correlation of Upper Freshwater Beds at Clacton (Pike and Godwin, 1953).

MIS	Pollen	Vegetation	Hoxne	Marks Tey	Clacton
11c	HoIV	Dominance of pine with fir, birch and grasses increasing		Organic clay mud and detritus mud	
	HoIIIb	Dominated by fir, some, alder, but decline of other deciduous trees			
	HoIIIa	Hazel and alder dominate with arrival of hornbeam and wingnut tree	Stratum D		Upper Freshwater Bed
	HoIIc	Deciduous forest with arrival of yew and elm		Organic clay mud	
	HoIIb	Deciduous forest with increase in alder and hazel	Stratum E		
	HoIIa	Dominated by oak, some alder and hazel			
	HoI	Increase in birch, occasional pine		Clay mud	
	lAn	Grasses, sedges, sea buckthorn, some birch	Stratum F	Grey clay, sand & gravel	