THE PALAEOLITHIC IN WORCESTERSHIRE, UK
A.D. Shaw, N. Daffern & O. Russell

ABSTRACT
In this paper we present the results of the first detailed study of the Palaeolithic archaeological record from Worcestershire. We demonstrate the presence of fluvially derived Lower Palaeolithic artefacts (mostly bifaces) associated with terrace gravels of the rivers Severn, Avon and Carrant Brook and identify the first possible evidence of earlier Middle Palaeolithic archaeology from the west Midlands. We also discuss the important, but largely overlooked, middle Devensian (~60 – 26 ky BP) archaeology from the Carrant Brook. Broadly associated with extensive palaeoenvironmental proxies and sizeable Devensian mammalian faunal assemblages, this contains evidence indicative of three phases of human activity attributable to the late Middle (~58 ky BP), final Middle (~38 – 36 ky BP) and early Upper Palaeolithic (~33 – 31 ky BP). Obtained from two localities (Beckford Priory and Aston Mill gravel pits), the three groups all contain artefacts which have undergone minimal reworking. They are indicative of a significant middle Devensian landscape associated with dynamic fluvial and geliflucted deposits within the Carrant Brook valley.


Keywords: Lower Palaeolithic, earlier Middle Palaeolithic, late Middle Palaeolithic, final Middle Palaeolithic, early Upper Palaeolithic, Middle Devensian, bifaces, Levallois, blade production, Leaf Points, Aurignacian, Worcestershire.

BACKGROUND
Recent investigations carried out for the English Heritage-funded ‘Putting the Palaeolithic into Worcestershire’s HER: creating an evidence based toolkit’ enabled a reassessment of the Palaeolithic in Worcestershire. The programme collated extant information, updated it based on recent evidence and new interpretations, and placed the results within the Historic Environment Record (HER) to allow it to be interpreted and used by non-specialists (Russell & Daffern 2014). Previous investigations carried out as part of the Aggregate Levy Sustainability Fund ‘Shotton Project’ recorded 159 Lower and Middle Palaeolithic artefacts from Worcestershire (Buteaux et al. 2005; Lang & Keen 2005). These did not, however, include a full assessment of the largest collection of artefacts from the county, the Whitehead Collection (n = 207), nor did it include unassessed pieces recovered in recent times. Here we report on the results of this new holistic study and consider the Palaeolithic record from Worcestershire in the context of the Pleistocene settlement history of the UK.

The Palaeolithic in Worcestershire
A biface found in Worcester during the 1920s represents the first Palaeolithic artefact noted from Worcestershire (Smith 1922). This was followed by other finds (mostly bifaces) associated with Pleistocene river terraces of the Severn, the Warwickshire/Worcestershire Avon and the Carrant Brook (e.g. Burkitt 1934; Smith 1958; Grinsell 1960). Nevertheless, by the late 1960s only ten artefacts had been found (Roe 1968). This number dramatically increased during the 1970s, 1980s and early 1990s thanks to the work of P.F. Whitehead in the Avon and Carrant Brook valleys (Whitehead 1977, 1988 & 1992). He also recovered extensive mammalian faunal collections and a raft of other palaeontological datasets, including molluscs, coleoptera and ostracods (Whitehead 1977, 1989a, b, c & 1992).

Since the early 1990s there has been little systematic research, with the majority of artefactual finds being individual chance discoveries. In the English Midlands as a whole the focus of Palaeolithic investigations has been the pre-Anglian record (>474 ky; >Marine
Isotope Stage [MIS] 12), thanks largely to discoveries from Waverley Wood, Warwickshire (Shotton et al. 1993; Lang & Keen 2005). Currently Worcestershire has had little to contribute to this debate as no pre-Anglian archaeology has been recovered, although being situated between two major pre-Anglian drainage systems — the rivers Mathon and Bytham — the potential remains. Arguably this regional temporal focus has been detrimental to study of the Palaeolithic in Worcestershire, as the sizeable, and nationally important, middle Devensian (~60–26 ky, MIS 3) record has received scant attention.

The Worcestershire archaeological record fits within a Pleistocene framework based on the regional river terrace sequences (Table 1). It is divisible into four temporal units: MIS 12–8 (~474–244 ky), MIS 7–6 (244–130 ky), MIS 5 (~130–71 ky) and MIS 4–3 (~71–24 ky). Extensive glacio-fluvial archives attributable to MIS 12–9 are associated with palaeoenvironmental datasets (e.g. Bushley Green and Pershore: Bridgland et al. 1986; Whitehead 1989a), but no Palaeolithic archaeology. The earliest deposits with artefacts date to MIS 7–6 (e.g. Twyning: Whitehead 1992); all the artefacts are fluvially derived and could have been produced at any time during, or prior to, the deposition of the sediments. As elsewhere in the country, deposits from the last interglacial (MIS 5e) and early Devensian (MIS 5d–5a) reflect a dearth of evidence for human occupation (Ashton & Lewis 2002; Lewis et al. 2011; but see Wenban-Smith et al. 2010). The most archaeologically productive contexts date to the middle Devensian (MIS 3) (Whitehead 1977 & 1989a).

Table 1. Pleistocene terrace sequences of the Severn and Warwickshire/Worcestershire Avon.

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<tr>
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<tbody>
<tr>
<td>MIS 2</td>
<td>Power House</td>
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<td>MIS 5a-2</td>
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<td>MIS 5e</td>
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<td>Ailstone</td>
<td>Strensham</td>
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<tr>
<td>MIS 8</td>
<td>Bushley Green</td>
<td>Pershore</td>
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<tr>
<td>MIS 9</td>
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<td>MIS 12</td>
<td>Woolridge Gravel</td>
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The lithic assemblages considered herein are from the Whitehead Collection (curated in the British Museum, Franks House) and individual finds in museums and institutions in Worcestershire (Figure 1; Table 2). The Whitehead Collection consists of 207 artefacts collected between 1972 and 1989 from sand and gravel quarries in south Worcestershire, and a small number from across the county boundary in north Gloucestershire. Chronologically the material as a whole can be subdivided between the Lower–earlier Middle Palaeolithic and the late Middle–early Upper Palaeolithic.
Table 2. Palaeolithic lithic assemblages studied

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<th>Locale</th>
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<th>County</th>
<th>Collection</th>
<th>Flakes</th>
<th>Levallois Products</th>
<th>Blades</th>
<th>Non-Levallois</th>
<th>Levallois Cores</th>
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The Lower and earlier Middle Palaeolithic

Lower Palaeolithic artefacts are all fluvially reworked and could be contemporaneous with associated deposits, or reworked from older sediments. The largest collections are from Twyning (Figure 2) where artefacts from two separate Avon terraces have been recorded (Whitehead 1989a). The earliest (‘Terrace 4’) deposits belong to the Cropthorne Member of the Avon Valley Formation (Maddy et al. 1991; Maddy & Lewis 2005, 78). They have two lithological facies, a clast-supported fluvial gravel overlain by sands and gravels with syndepositional ice-wedge casts. The former contains a mammalian faunal assemblage with evidence for Mammuthus primigenius, Coelodonta antiquitatis, Equus ferus, Cervidae and Bovidae sp. indet. (Schreve 1998, 681); Rangifer tarandus has also been recorded (Whitehead 1989a). The lack of clearly temperate deposits, the faunal species’ representation in the lower gravel and the presence of syndepositional ice-wedge casts in the overlying unit suggest the deposits date to MIS 6 (Schreve 1998, 688). The second, younger, suite of deposits (‘Terrace 2’) consists of orange/pink horizontally-bedded quartzose sand overlying cross-bedded sands and gravel (Whitehead 1992) of the Wasperton Sand and Gravel, Upper Facet (BGS 1:50,000 Geology Digimap); this whole unit is thought to have been deposited between MIS 5a and 2 (Maddy et al. 1991; Maddy & Lewis 2005; Penkman et al. 2013, 124–127).

The collection from ‘Terrace 4’ consists of ten hard hammer flakes, one soft hammer biface thinning flake, two cores (simply flaked through discoidal and migrating platform reduction) and eight bifaces. Most are on flint (the exceptions being a quartzite core and a biface). That from ‘Terrace 2’ totals four artefacts on quartzite blanks: one flaked flake, two cores and a biface. All the material is fluvially derived and technologically Lower Palaeolithic. Thus, both sets of artefacts could originate from older (pre-MIS 6) deposits. Those pieces from ‘Terrace 4’ have been suggested to be broadly contemporary with the associated lithological units as there are no remnants of earlier terrace deposits in the vicinity (Lang & Keen 2005, 77). This assertion is questionable as earlier terrace deposits are located just 2.5 km upstream to the south of
Upper Strensham (Pershore Member), which are themselves adjacent to sediments equivalent to those at Twyning (Croppthorne Member). Consequently, there exists a mechanism for how material could be reworked from earlier terrace deposits into the Twyning ‘Terrace 4’ sequence.

Analogous artefacts were also identified from fluvial contexts at Bredon’s Hardwick (MIS 5a–2), Lower Moor (MIS 5a–2), Henwick (MIS 2; Devensian outwash gravel) and possibly Eckington (MIS 5) (Table 2). A moderately rolled quartzite biface comes from the modern land surface at Madresfield Park in an area underlain by Holocene alluvium (BGS 1:50,000 Geology Digimap). The nearest known extant Pleistocene deposits are located 1 km to the east, and belong to Bushley Green Member of the Severn Valley Formation dated to MIS 9/8 (Bridgland et al. 1986; Penkman et al. 2013, 124–127). A rolled biface made on an unusual fine-grained volcanic clast from Allesborough is notable as such raw material does not occur regionally; the original clast may have been brought into the area as a glacial erratic (Figure 3). It was recovered as a chance find from a ploughed field adjacent to Avon deposits belonging to the New Inn Sands and Gravel Member. These are correlated with MIS 5 (Maddy et al. 1991; Penkman et al. 2013, 124–127) and, if indeed from this context, the biface is likely to have been reworked from earlier deposits.

A notable exception amongst these clearly derived pieces is a flint biface from a field at Moseley Park, Hallow. Although exhibiting some edge damage, incipient frost flaws and moderate patination, it is fresh and unrolled (Figure 4). It is pointed with secondary working on one face, one lateral edge and the tip, which is extensively thinned whilst the butt has been left thick and heavy. This findspot is on the edge...
of deposits belonging to the Kidderminster Station Member of the Severn Valley Formation (BGS 1:50,000 Geology Digimap) of MIS 7/6 age (Maddy et al. 1995). It is an intriguing artefact as it has not been reworked and may therefore be broadly contemporary with these sediments. If so, it would represent the first earlier Middle Palaeolithic findspot in the west Midlands. If it is not contemporary with the terrace it is nevertheless indicative of a unique occurrence of relatively undisturbed Lower or Middle Palaeolithic archaeology in this region.

Later Middle Palaeolithic and early Upper Palaeolithic

The largest and most significant collections studied are from the Carrant Brook, notably from gravel pits at Beckford and Aston Mill. Deposits here produced extensive palaeoenvironmental datasets attributable to the middle Devensian (MIS 3), whilst the artefact collections contain pieces of late Middle, final Middle and early Upper Palaeolithic affinities.

Beckford Priory Gravel Pit, Beckford

The village of Beckford is located to the south of Bredon Hill, directly north of the Carrant Brook. Palaeolithic artefacts have been found here since the late 1950s (Grinsell 1960), and were extensively collected by Whitehead from Beckford Priory Gravel Pit, east of the village (Figure 5); the material was obtained both from exposed sections, modern surfaces and reject heaps (Whitehead ms. BM[FH]Whitehead). The sediments here belong to the local equivalent of the Wasperton Sand and Gravel, Upper Facet of the Avon (BGS 1:50,000 Geology Digimap) of MIS 5a and MIS 2 age (Maddy et al. 1991; Maddy & Lewis 2005, 79;
Penkman et al. 2013, 124–127). At Beckford they consist of well-bedded water worn gravel overlain by cross-bedded sands which, away from the Carrant Brook, are replaced by roughly stratified gravel. This reflects a transition from fluvial deposition to geliflucted material along the footslopes of Bredon Hill (Briggs et al. 1975). The sands and gravels contained periglacial structures indicative of two phases of activity — one during deposition and one post-dating the aggradations (Briggs et al. 1975). The deposits are uniformly overlain by brown silty clay loam derived as weathering products through gelifluction and aeolian deposition (Briggs et al. 1975).

Within the sands several beds of silt were observed which produced abundant plant, coleopteran and mollusc remains. They are interpreted as implying a local environment comprised of open, dry land, crossed by small streams and containing small, temporary, ponds. The climate represented by the fauna and sediments is suggested to be indicative of general aridity, with a larger annual temperature range than in the area today — mean summer temperatures below 10°C, with temperatures of at least –6 to –8°C during ice wedge formation (Briggs et al. 1975). A mammalian faunal assemblage was recovered and is attributable broadly to the Beckford sequence, consisting of Mammuthus primigenius, Coelodonta antiquitatis, Equus ferus, Bison priscus, Ovibos moschatus, Rangifer tarandus and Microtus gregalis (Whitehead 1977, 45). These species are typically associated together within middle Devensian deposits (60–26 ky: Currant & Jacobi 2001 & 2011).

The collection studied consists of 86 artefacts including bifaces, Levallois cores and products, bifacial points, blade cores and products, non-Levallois and non-laminar cores and flakes. The bifaces subdivide into two taphonomically distinct groups. The first (n = 15) exhibits moderate/heavy fluvial abrasion, heavy patination and, frequently, moderate to heavy staining; these have undergone significant fluvial displacement. The second (n = 3) are heavily patinated, but only lightly abraded and unstained (or only lightly so) suggesting less reworking. Techno-typologically these also subdivide into two groups: those which could be Lower Palaeolithic or Middle Palaeolithic in age; and those with late Middle Palaeolithic features. The latter are associated with the
reoccupation of Britain by Neanderthals during early MIS 3 (~58 ky BP); the three lightly abraded bifaces all fall within this grouping. In total, seven exhibit features potentially indicative of this age attribution (cf. Boëda 2001; Cliquet et al. 2001; Halliwell & Scott 2011; White 2012) including several phases of shaping: retouch (or use-damage) to the butt; retouched or utilised portions opposed to a modified, blunted edge; and planoconvexity resulting from using an initial flake blank (or as is frequently the case with Beckford, tabular frost shattered blanks). There are, however, no typo-technologically distinctive bout coupés (cf. White & Jacobi 2002). The assemblage also contains six Levallois cores and one product. Four cores are unabraded or only lightly so, whilst two have clearly undergone some degree of fluvial transport. The product, a Levallois flake, is unabraded. The cores tend to reflect single phases of preparation and exploitation, probably due to the characteristics of the blanks — flakes, split cobbles and small, flat nodules; three are simple prepared cores which reflect the exploitation of natural convexities to exploit a flaking surface with only minimal preparation of the striking platform and/or flaking surface (White & Ashton 2003). Only a few of these pieces are associated with specific contextual information. These are four rolled bifaces which lack clear typo-technological affinities and a Levallois core; they are attributed to the base of the gravel and all are rolled.

Significantly the collection includes a fragment of a fully bifacial leaf point (Jacobi & Higham 2011). These rare and enigmatic artefacts are thought to date to ~38–36 ky BP and may represent the final presence of Neanderthals in Britain (Jacobi et al. 2006; Jacobi 2007). The Beckford example is a tip from a piece produced on a thin flake or tabular blank. It show signs of light fluvial abrasion, is moderately edge damaged, heavily patinated and slightly stained. The collection also contains a second bifacial retouched point. This is of a mesial fragment of a partially bifacially thinned point on a thermal fragment. It is difficult to classify, but may be associated with the leaf point. Neither piece was recovered in situ.

Seven blade cores and eight blades are also present and are in broadly analogous condition — unabraded, or only slightly so, edge damaged, heavily patinated and show little, or no staining, this suggests that they have not undergone significant fluvial transport. They are technologically consistent and reflect reduction through bipolar and unipolar blade production with a soft hammer. Blade production was initiated though cresting and there is evidence of platform rejuvenation through the removal of a core tablet. One bladelet core fragment is also present and two pieces of laminar debitage are retouched. Although none of these pieces display typological characteristics suggesting clear age attribution, it is notable that one core was obtained from the top of the Beckford gravels. This suggests it may derive from a different context to at least some of the bifaces and Levallois cores (see above).

The Beckford assemblage contains fluvially reworked material and pieces which have undergone limited or no fluvial transport. The latter contains Middle Palaeolithic material and includes pieces which are likely to be late Middle Palaeolithic, potentially from two chronologically distinct phases (early MIS 3: ~58 ky BP; and mid MIS 3: 38–36 ky BP).

**Aston Mill Gravel Pit, Kemerton**

Aston Mill Gravel Pit is north of the Carrant Brook, 3 km west of Beckford (Figure 6). It contains sands and gravels belonging to the local equivalent of the Wasperton Sand and Gravel, Upper Facet of the Avon (BGS 1:50,000 Geology Digimap) of MIS 5a–2 age (Maddy et al. 1991; Maddy & Lewis 2005; Penkman et al. 2013, 124–127). The local geological sequence comprises basal clast-supported gravel, primarily of local origin, overlain by cross-bedded sands which interdigitate towards the valley sides, suggesting a degree of contemporaneity between the two deposits. The gravels may represent active channel zones, whilst the sands reflect aeolian derived sediments deposited, or reworked, during high flood events in areas adjacent to these zones (Dawson 1987, 272). The gravels have produced the remains of *Mammuthus primigenius*, *Coelodonta antiquitatis*, *Equus ferus*, *Bison priscus*, *Ovibos moschatus* and *Rangifer tarandus*, whilst channel silts produced a large number of elements from *Bison priscus*, with a smaller component of *Rangifer tarandus* (Whitehead...
This is a similar species range to that found at Beckford (see above).

The artefacts from here were recovered from localities spread across the workings (Whitehead ms. BM[FH]Whitehead); a total of 102 have been assessed. They belong to seven techno-typological groupings: bifaces, Levallois cores and products, blade cores and laminar products, non-Levallois and non-blade cores and flakes. There are 24 bifaces, which, as with the Beckford examples, subdivide into two broad condition states indicating derived and less reworked elements. The majority ($n = 19$) are moderately/heavily abraded, heavily edge damaged, heavily patinated and generally heavily stained, whilst five are unabraded/slightly abraded, and tend to be less stained. As at Beckford, the biface assemblage contains three examples which display features that may indicate a late Middle Palaeolithic age attribution (see above); all three belong to the less abraded collection. There are also three biface thinning flakes which are fresh or only slightly abraded, one of which is burnt at the distal end. Unfortunately, the bifaces lack detailed contextual information, one of the thinning flakes, however, was recovered from the base of the gravel.

The Levallois component consists of five flint cores, along with one definite flake. Two are classic cores (sensu Boëda 1995), the remaining three are simple prepared and reflect the exploitation of natural convexities to exploit a flaking surface with only minimal preparation of the striking platform and/or flaking surface. As at Beckford, their presence reflects the application of the Levallois concept to suboptimal raw material; two are on frost shattered clasts. All are fresh or only slightly abraded.

Eight blade cores and six blades were noted. All are unabraded/slightly abraded, and have not undergone significant fluvial transport. The cores are broadly analogous with those from Beckford. One of the blade products is retouched to produce a nosed scraper. It is a crested piece with a burin removal along one lateral which is truncated by steep retouch, and has been noted to have parallels with examples in continental European Aurignacian assemblages (Dinnis 2015) Additionally, the collection contains a shouldered scraper which has also been considered to be indicative of this period (Jacobi & Pettitt 2000). The Aurignacian in Britain is suggested to date to ~33–31 ky BP.
(Dinnis 2012, but see Higham et al. 2011 & Dinnis 2015). Unfortunately, none of these pieces is associated with detailed contextual information, and it is not possible to assess the degree of association between the two scrapers and the other laminar pieces.

The Aston Mill lithic assemblage reflects and compliments that from Beckford. It contains rolled, fluvially derived pieces and fresher examples which have clearly undergone less reworking. As with the Beckford sample this latter grouping contains pieces indicative of at least two periods within the middle Devensian. The first of these is represented by bifaces and Levallois material which may be contemporary with similar pieces from Beckford (early MIS 3: ~58 ky BP), whilst the latter (as represented by the nosed and shouldered scrapers; ~37–32 ky BP) may be slightly later than that from Beckford (as represented by the bifacial leaf point; ~38–36 ky BP). Both localities have produced extensive mammalian faunal remains characteristic of the middle Devensian; it is currently unclear whether any human activity can be directly related to any of this faunal material (e.g. cutmarks or breakage for marrow extraction).

**DISCUSSION**

This study demonstrates that the archaeological record in Worcestershire subdivides between the Lower/earlier Middle Palaeolithic and late Middle/early Upper Palaeolithic. The former consist largely of fluvially derived artefacts (mostly bifaces) associated with deposits of the Severn, Avon and Carrant Brook. They indicate clear evidence for post-Anglian (MIS 12) occupation and may also include reworked pre-Anglian material — perhaps comparable in age to that from Waverley Wood (MIS 13; Shotton et al. 1993; Lang & Keen 2005) — but this cannot currently be demonstrated. The earliest potential evidence for relative undisturbed occupation is earlier Middle Palaeolithic, as represented by the biface from Moseley Park (?MIS7/6). The earlier Middle Palaeolithic record of Britain is dominated by sites from the Thames Valley. These are characterised by Levallois flaking with bifaces being largely absent (Scott 2011). It has, however, been suggested that sites from the west of Britain display an opposite trend with bifaces being present, but little Levallois material (Scott & Ashton 2011). It is possible that the Moseley Park biface falls within this pattern, particularly as early Middle Palaeolithic assemblages (MIS 7), including bifaces, are found at Pontnewydd, north Wales (Aldhouse-Green et al. 2012). In order to demonstrate this, however, a specific context for the Moseley Park would need to be established.

The most extensive and informative material belongs to the late Middle/early Upper Palaeolithic. Found in relative abundance and often in generally fresh condition along the Carrant Brook, these lithic assemblages may belong to three chronologically distinct periods of the middle Devensian. The first is represented by technologically distinctive bifaces, apparently associated with Levallois material. These could be associated with the Neanderthal reoccupation of Britain during early MIS 3 (~58 ky BP) and be broadly contemporary with that from locations such as Lynford, Norfolk (60–53 ky BP: Schwenninger & Rhodes 2012; White 2012). The association with Levallois material is notable as it is currently not known from the small corpus late Middle Palaeolithic locales in Britain, but common amongst contemporary continental European sites (White & Jacobi 2002). The second grouping is marked by leaf points and characteristic Aurignacian material; they indicate an association with the final Middle and early Upper Palaeolithic. Leaf point industries have been generally associated with final Neanderthal occupation of Britain and are suggested to date to ~38–36 ky BP (Jacobi et al. 2006; Jacobi 2007) whilst the Aurignacian may date to ~33–31 ky BP (Dinnis 2012, but see Higham et al. 2011 & Dinnis 2015) and is thought to represent the earliest anatomically modern human presence.

The deposits within the Carrant Brook are therefore highly significant, having produced the full sweep of techno-typological groupings which define this important period. The specifics of how aspects of these techno-typological groupings relate to each other is one of the vexed questions of the late Middle and early Upper Palaeolithic; for example, are all technologies with leaf points more recent than those with bifaces (Jacobi & Higham 2011)? Currently, the Carrant Brook datasets cannot answer such questions, but they do point to deposits with material which could. These are
part of a dynamic middle Devensian landscape formed through a complex interplay between fluvial deposition and gelifluction of material into the valley from Bredon Hill, and are associated with extensive palaeoenvironmental proxies, including mammalian fauna suggesting cool/cold, arid conditions. The associated archaeology, therefore, has the potential to investigate subsistence practices, and the use of place and landscape by late Neanderthals and early modern Humans during the changing environments prior to the Last Glacial Maximum.

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