CHANGE AND CONTINUITY WITHIN THE PREHISTORIC LANDSCAPE OF THE FOULNESS VALLEY

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Summary

Exploration of the Foulness valley has revealed a remarkable wealth and continuity of prehistoric activity. The archaeological evidence includes a Lower Palaeolithic hand-axe, Mesolithic sites and a concentration of Neolithic polished stone and flint tools. An attempt has also been made to provide an environmental framework for the distribution of these and previous Bronze Age finds. As a result of this work, one of the oldest and largest Iron Age iron industries in Britain and two contemporary logboats have been discovered.

Peat and alluvium have preserved faunal and palaeo-environmental evidence ranging from the bones of straight-tusked elephant to Bronze Age bog-oaks, which when combined with new evidence for sea-level change, enable environmental reconstruction over a long time-span, thus providing a context through which the archaeological remains can be better understood. For summary and interpretive articles based on the research documented here see Halkon 2003; Halkon 2008; Halkon and Innes 2005. Detailed information is also available at www.ironmasters.hull.ac.uk.

[Note: Radio-carbon dates have been re-calibrated after Pearson and Stuiver 1993, using the University of Washington Quaternary Isotope Laboratory Radio-carbon Calibration programme (rev 3.0.3), Stuiver, M. and Reimer, P.J., 1993, *Radiocarbon* **35**, 215-30.]

Introduction

The study area (Fig. 1) is focused on the valley of the River Foulness, in the eastern Vale of York. To the north and east is the scarp slope of the southern Yorkshire Wolds, which form a ridge of exposed chalk environment, 8-10km in width, that falls eastwards to disappear under the Devensian till mantle of western Holderness. This ridge which runs north-south, is distinct from the mass of the northern and eastern Yorkshire Wolds where most archaeological attention in the region has been concentrated in the past. The biased nature of archaeological coverage has already been noted by Powlesland (1986, 86), whose West Heslerton Parish Project in the Vale of Pickering, has shown considerable prehistoric activity on the sandy lowlands to the north of the Yorkshire Wolds. The work around Holme-on-Spalding Moor was the first systematic archaeological survey of a lowland landscape in the eastern Vale of York. Subsequently research has been extended by the Humber Wetlands Project (Ellis *et al.* 1993; Van de Noort and Ellis 1995, 1997, 1999, 2000; Van de Noort 2004).

Initiated in 1980 by Peter Halkon, with members of E.R.A.S., this research began by field-walking the area around Hasholme and Bursea. In 1983 the area of study was expanded to cover a 6,400 ha block of landscape around Holme-on-Spalding Moor (henceforth HLB), with its corners at SE 7740, 7732, 8532 and 8540. Field-walking, aerial photography and geophysical survey were combined with research and rescue excavations, in collaboration with Professor Martin Millett.

This study area contains a wide variety of soil types and topography, with alluvial deposits ideal for the preservation of palaeo-environmental evidence, providing a great opportunity for combining the palaeo-environmental and archaeological resource, in order to explore human interaction with this landscape in the past.

The initial aims of the project were to assess the relationship between agriculture and industry in the Iron Age and Roman periods within the HLB, examining the impact of environmental factors, such as soils and watercourses, on settlement patterns (Halkon 1983; 1987; 1989; 1990; 1998; 2003; Halkon and Millett 1999; Halkon, and Millett 2000; Halkon *et al.* 2000; Millett and Halkon 1988). Using Ordnance Survey map sheets SE 83 (1977) and SE 73 (1981) at a scale of 1:25,000, and the appropriate Soil Survey maps (Furness and King 1978), the method adopted was to walk available land, on one farm per OS grid square. Fields selected were systematically line-walked (Fasham *et al.* 1980), and concentrations of material assumed to represent sites where activity had been concentrated were grid-walked (*ibid.*) in 5 or 10 m squares. Regression and correlation analysis showed that the area of each soil type walked was representative of the total area of each soil type (Halkon 1987; Halkon and Millett 1999). Coverage was systematic, but the possibility that other sites and single finds may lie undetected (buried by alluvium in the river margins, or by windblown sand, especially in the areas to the north of the landscape block) must be considered.

From fieldwork it soon became apparent that there was an unexpected wealth of evidence relating to earlier prehistoric activity within this landscape – especially in the Mesolithic and Neolithic – as worked flints and other material were found. Neolithic and Mesolithic artefacts had also been found on several local excavations (Hicks and Wilson 1975; Millett and Halkon 1985, and 1986), though these were generally residual. During the fieldwork, many farmers informed us of discoveries they had made, and a number of previously unknown flint and stone axes and other artefacts were recorded. These can be combined with

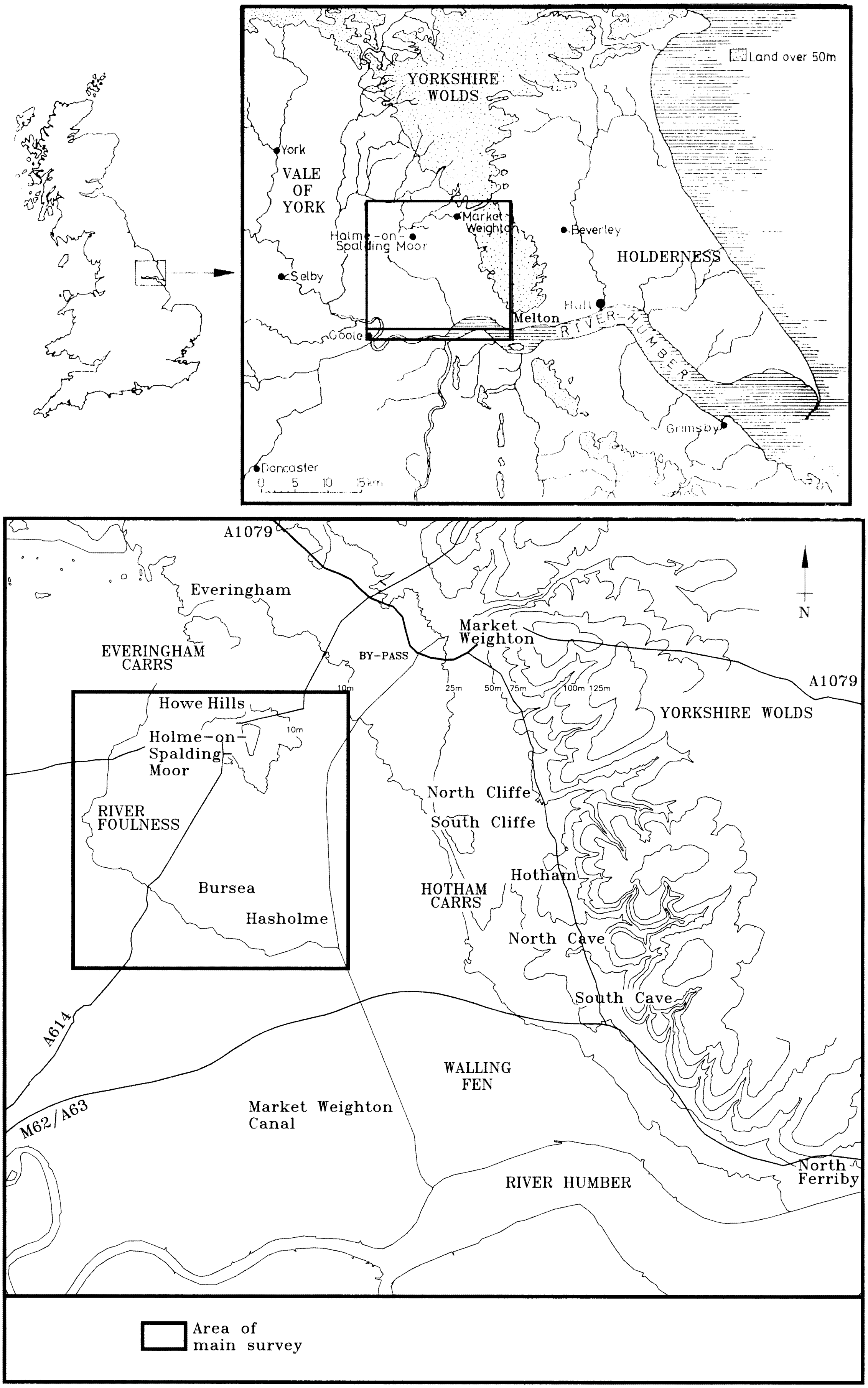

Figure 1 General location map of the Foulness valley

finds of earlier workers (such as W. and B. Williams, J.E. Routledge of Market Weighton, Tom Sheppard, and A.L. Armstrong), though unfortunately precise details concerning some of their discoveries have been lost – many finds being simply attributed to parish. The combined evidence of these early records, field-walked finds, and those reported by farmers, forms a significant distribution.

Since 1985 the project has expanded to examine the wider area of the Foulness valley, including the higher land on the Wold edges and a wider variety of soils (King and Bradley 1987) and topography, thus allowing comparison of contrasting landscapes. Within this larger area, the vigilance of Mr T. Mott has given important impetus to this research, .his discoveries during his work as a gamekeeper on the Houghton Hall Estate, around the villages of North and South Cliffe, have greatly added to our knowledge of prehistoric activity in lowland East Yorkshire.

The most detailed fieldwork so far (apart from that within the HLB) took place prior to and during the construction of the Market Weighton by-pass in 1989-90 (see Halkon and Millett 1999, 168-220). In addition to that project, the sediments from various watching briefs and a salvage excavation, at Market Weighton Beck and Skelfrey Beck, were analyzed, and the results are presented here (Section 2.4). Dr J. Innes and other members of the Department of Geography, University of Durham, have also studied cores from a bore-hole transect along the southern Foulness valley (Section 2.3), complementing analysis of deposits associated with the Hasholme Boat (Millett and McGrail 1987). In 1996 an additional opportunity to investigate palaeo-environmental deposits was provided during the construction of an irrigation lake at Hasholme Grange, in the field immediately to the east of the Hasholme Boat find-spot. Samples were taken and analyzed on separate occasions by Dr J. Innes, and Pat Wagner with a group of students from the University of Sheffield.

What follows are the results of this landscape survey, placing earlier prehistoric sites and artefacts in the context of new information concerning the prehistoric environment. The later Iron Age and Roman aspects of the project have been published in a separate report (Halkon and Millett 1999). The approach taken here is to provide a period-by-period synthesis, integrating conclusions from specialist reports, to form a narrative (Section 1). This is followed by details of the palaeo-environmental data (Section 2) and artefactual evidence (Section 3).

Section One

1.1 Geological background (Figs 2-3; Pl. 1) with Geoff Gaunt

The geology of the southern part of the area is described in two British Geological Survey (BGS) memoirs (Gaunt *et al.* 1992; Gaunt 1994). These accounts can be extrapolated northwards to the rest of the area, except for deposits on the summit of Church Hill, Holme-on-Spalding Moor, and mammaliferous deposits near Bielsbeck Farm and adjacent localities.

Bedrock under most of the low ground east of the River Foulness consists of Triassic Mercia Mudstone (formerly called Keuper Marl), which is concealed by Quaternary deposits, except where it forms Church Hill. However, the eastern edge of the low ground is underlain by mudstones of the Triassic Penarth Group (formerly called Rhaetic), except east of Ellerker Sands Farm, where it is underlain by Liassic mudstones – all but the basal strata of which are Lower Jurassic. To the east, Liassic mudstones with interbedded thin limestones form the bench-like feature on which North Cliffe and South Cliffe are situated. Middle and Upper Jurassic rocks – the latter consisting mainly of impermeable mudstones – form the rising ground farther east, and these rocks are overlain unconformably by Upper Cretaceous Chalk, which occupies the highest part of the Yorkshire Wolds scarp slope. Because the Chalk is permeable, a spring-line exists at its base along the scarp slope, which has had an impact on human exploitation of the area (see below).

The Quaternary deposits of the area, most of which are discontinuous and do not form a comprehensive stratigraphic sequence, are summarised here in their presumed chronological order. It is uncertain whether any pre-Devensian glacial deposits exist in the area. An unpublished reconnaissance by one of us (G. Gaunt), along the scarp slope between Market Weighton and North Cave, failed to confirm any deposits there as undoubtedly glacigenic, Devensian or otherwise. The gravel capping Church Hill, which rises to 46m OD, may be of pre-Devensian glacial origin. Its main constituents (erratics of Carboniferous rocks: Melmore 1935, 42), and its hill-top location, compare closely with pre-Devensian gravels capping Brayton Barff and Hambleton Hough west of Selby; but, unlike these deposits, the gravel on Church Hill lies within the presumed maximum advance of late Devensian ice in the Vale of York, and its survival of this event would be difficult to explain. It is, alternatively, conceivable that the gravel on Church Hill is itself a product of this late Devensian ice advance.

Deposits containing mammalian fossils have been found in shallow excavations at several places on ground east of Church Hill; some are of interglacial origin, but others may be early to mid-Devensian in age. Their locations, faunas (with current names) and lithological contexts are summarised in Table 1; their distribution is shown in Fig. 2, and they are discussed in more detail by Schreve in Section 2.1 below. The best known of these deposits was found near Bielsbeck Farm early in the 19th century (Vernon Harcourt 1829), and subsequently re-assessed several times (e.g. *Rep. Brit. Assoc.* for 1907 (1908); Stather 1910; Melmore 1935, 72-4; De Boer *et al*. 1958, 197-8). More recent re-assessments of the contained fauna (Catt 1987; 1990; Sutcliffe 1995) suggest correlation with a post-Hoxnian, pre-Ipswichian interglacial that equates with Oxygen Isotope Stage 7, and is dated to between *c.* 245,000 and 186,000 years BP. In 1993 and 1994 Mr T. Mott and P. Halkon found teeth and bones of *Palaeoloxodon antiquus* (Straight-tusked elephant: identified by M. Stanley and M. Boyd) at Mott's Field, only l.8 km south of Bielsbeck. The similarity of the bone assemblages, and the proximity of Mott's Field to Bielsbeck, suggest their contemporaneity (see Schreve, Section 2.1, below).

More bones, recovered by Mr Mott, have recently been found at a site to the west of North Cliffe (SE 868 368), equidistant between the Bielsbeck and the Mott's Field locations, comprising *P. antiquus* and *Mammuthus primigenius* (mammoth)*, Equus ferus* and *Cervus elaphus* (see Section 2.1, below). This assemblage, if representative

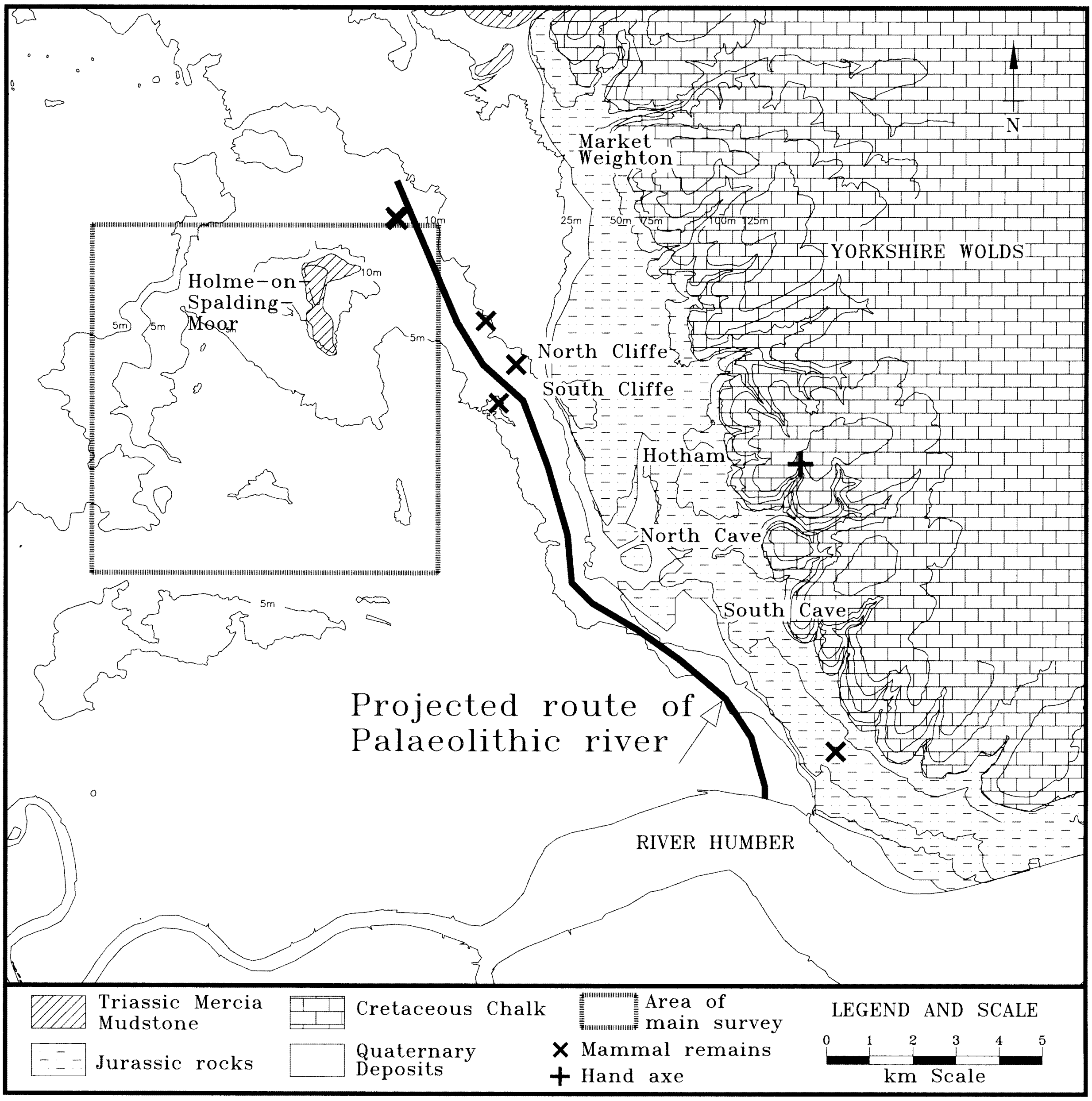

Figure 2 A generalized geological map of the Foulness valley, showing the projected route of the Stage 7 to Mid Devensian river, and the distribution of mammaliferous deposits and the Palaeolithic hand-axe

of a single climatic episode, is strongly suggestive of the stage 7 interglacial (Sutcliffe 1995).

In 1991 Mr C. Smith discovered remains of *M. primigenius* in two adjacent pits on Galley Moor, 3.2km north-west of the Bielsbeck location. One of the mammoth teeth and some associated organic material have yielded dates of 47,000 and 46,000±2300 radiocarbon years respectively, close to the limit of this dating method (pers. comm. P. Armstrong, and the Humber SMR): these dates imply an early to mid-Devensian age. A tibia of *M. primigenius* was found only 1km north-west of Galley Moor, near Harswell, many years ago, and is now in the Yorkshire Museum (Melmore 1935, 74).

Stather (1910) suggested that the Bielsbeck deposit occupies an infilled river valley (Fig. 3), and indeed the coleopteran evidence which includes remains of freshwater species (see Section 2.1 below) supports this hypothesis. The silty deposits containing the Galley Moor remains were described by P. Armstrong, as being from a former channel. These inferences, and the locations of the mammaliferous deposits, raise the possibility that these finds are situated in a now-concealed former valley – a "proto-Foulness" – that runs south-south-eastwards between Church Hill and the Yorkshire Wolds. Its main drainage hinterland was the spring-line along the Wolds escarpment, conceivably as far north as Great Givendale, beyond which the direction of the scarp-slope valleys changes from south-westwards to westwards, suggesting an ancient change of catchment. Such a postulated valley could have persisted from before the Stage 7 interglacial, until it was concealed beneath the deposits of Lake Humber in late Devensian times. The valley floor would probably have been at quite a shallow depth, because an unpublished borehole-based rock-head contour study, by one of us (G. Gaunt), of the central part of

Table 1 Mammaliferous and Palaeolithic deposits in the study area (see Fig. 2)

Site name	**NGR(SE)**	**finds**	**context**	**depth** (m)
Bielsbeck Farm	861378	mammoth (*Mammuthus primigenius*)	grey marl	2.13
		horse (*Equus ferus*)	grey marl	3
		rhinoceros (*Stephanorhinus sp.*) deer (*Cervus sp.)*		3
		bison (*Bison priscus*) wolf (*Canis lupus*)	black 'marl', shells of *Planoribus complantus* and *Limnaea palustris*	3.35
		straight-tusked elephant (*Palaeoloxodon antiquus*)	black 'marl'	3.65
		horse (*Equus ferus*)	vegetation and *Coleoptera* remains	3.95 & 6.14
North Cliffe	808368	*Equus ferus* *Cervus elaphus* L., red deer Bovidae *sp.*		
Mott's Field, South Cliffe	86403591	straight-tusked elephant (*Palaeoloxodon antiquus*)	dark grey silt	
Galley Moor	84014019	mammoth teeth and bone fragments (*Mammuthus primigenius*)	dark grey silt mollusca and vegetation	1.90
Galley Moor	84054013	mammoth tusks (*Mammuthus primigenius*)	vegetation	
Elloughton, Mill Hill	942279	*P. antiquus, M. primigenius, Cervus elaphus and Equus ferus*	Yellow sand with layers of pebbles, below rough current bedded sand and gravel	
Palaeolithic artefact				
Hotham	93383452	Acheulian hand-axe in white cherty flint (see Roe, Section 3.1 below)	surface find	

the Vale of York, found no evidence east of Church Hill of rock-head deeper than -5m OD.

One other mammalian deposit is recorded from the area under consideration, being found at the top of Mill Hill, Elloughton (Lamplugh 1887; Sheppard 1897). Its faunal list (De Boer *et al*. 1958, 198) is similar to that from near Bielsbeck, but its isolated occurrence, at an estimated height of 28 to 30m OD, precludes deposition in the shallow valley postulated above, and its origin and age remain unknown.

The only deposit in the area that appears to be of early to mid Devensian age is that at Galley Moor, summarised above. In the late Devensian, a southward surge of ice is believed to have covered much of the area transiently, but, with the possible exception of the sand and gravel at Wholsea Farm, no local deposits resulting from this event are known – although it is conceivable that the gravel capping Church Hill is an ablation deposit from this ice. The formation of extra-glacial Lake Humber was approximately coeval with the ice surge, but the lake persisted for a much longer, although as yet undated, part of the late Devensian. Its deposits are widespread in the area. Littoral lacustrine sands and gravels occur impersistently on the lower scarp slope of the Wolds, and near-shore lacustrine sands occupy much of the low ground to the west as far as the River Foulness, concealing the mammaliferous deposits beneath them. In a few places, notably on and near to Holme Common, these sands pass laterally into laminated clays, deposited in more offshore parts of the lake, and these clays form much of the flat low ground elsewhere in the Vale of York.

There are, in addition, late Devensian head (i.e. solifluction) deposits on the lower scarp slope of the Wolds, and widespread blown sand. Comparable blown sands elsewhere in the Vale of York and in northern Lincolnshire are dated to approximately the last millennium of the Devensian Stage, the Loch Lomond Stadial – in effect, from 11,000 to 10,000 radiocarbon years ago. Some of the lacustrine sand was redistributed by wind during this time, and some of it was further re-worked into levees of rivers and streams that eventually initiated courses across the emergent lacustrine plain. Air photographs of the low ground east of Church Hill, taken by Derek Riley in the 1970s and by P. Halkon in 1995, show crop-marks indicating a series of braided channels, probably initiated at this time (Pl. 1). These channels suggest a rejuvenation of the Stage 7 to mid-Devensian drainage postulated above, but with a reduced catchment area which did not extend to the north of Market Weighton. Drainage from the Wolds escarpment farther north evolved into the present River Foulness and Pocklington Beck courses.

There are extensive expanses of Holocene alluvial

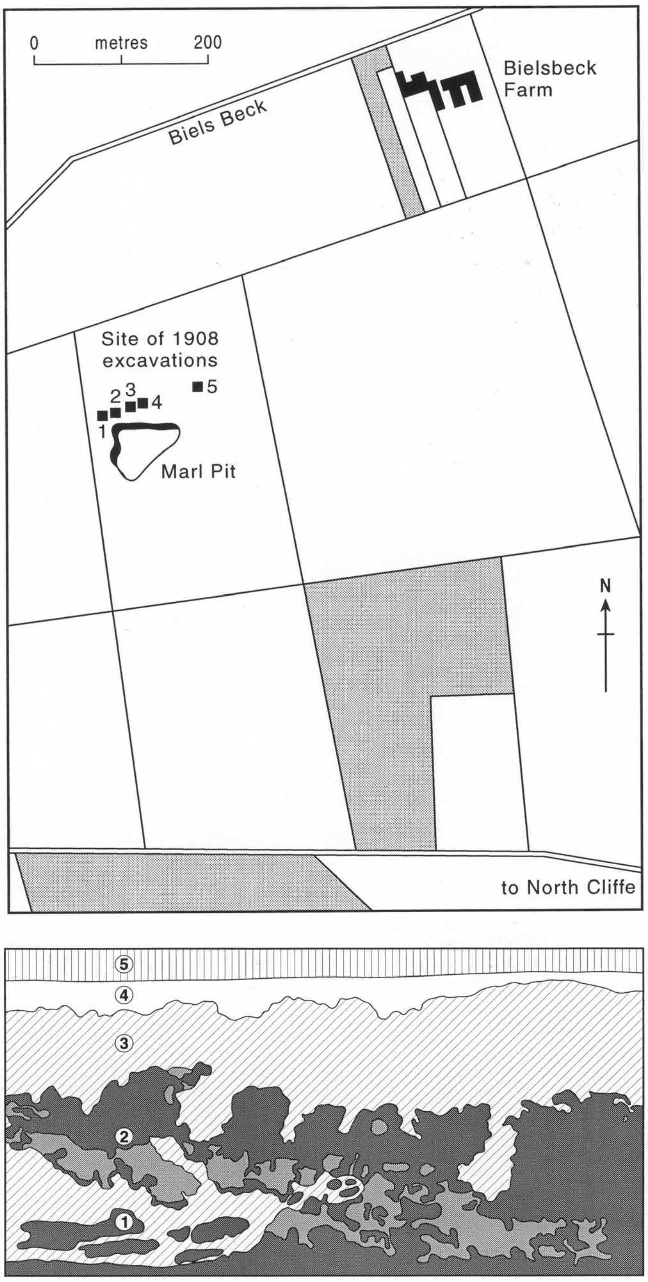

Figure 3 Plan and cross-section of Bielsbeck area, showing the site of the 1908 excavations (after Stather). The layers within the section are as follows: 5. Black sand (0.23m). 4. Yellow sand (0.45m). 3. White gravel consisting of small pebbles of chalk, with angular fragments of flint, with a few pieces of *Gryphaea* incurve, and fewer pebbles of sandstone (0.75). 2. Blue marl, containing bones, and irregularly penetrated by the gravel (1.5m). 1. Blacker marl, containing bones, land-, marsh-, and freshwater Mollusca, Coleoptera and plant remains (at least 3m)

clay, and, to a lesser extent, of peat, in the area – notably Everingham Carrs and Hotham Carrs in the northern part, and Walling Fen in the south. Sheppard (1966) suggested that Walling Fen was formerly salt-marsh that was gradually drained and reclaimed in medieval times; the earlier history of this feature will be considered below. Further south are two arcuate former estuarine silt banks, '*Bromefleet New Sands*' and Broomfleet Island, which were embanked and reclaimed at the end of the 17th century, and the beginning of the 20th century, respectively.

1.2 Archaeological background

Palaeolithic archaeology (Figs 2 and 4)

The only definite evidence of human presence in the area at this date is an Acheulian hand-axe of white cherty flint (Fig. 4), found at the surface on high open ground near the head of St. Austin's Dale, east of Hotham, by Mr S. Foster. On typological grounds, it can be assigned broadly to the time between Oxygen Isotope stages 11 and 6 (see Section 3.1, below). The find-spot provides a dramatic view down to the Humber and the Lincolnshire Wolds beyond, and it may have been lost on the natural route-way between lowlands to the west and the higher chalk Wolds to the east. It is conceivable that other palaeolithic artefacts may exist at the surface in the area, but because of the widespread cover of late Devensian and younger deposits – especially on low ground – the scope for any such finds would be limited to those parts of the Wolds scarp slope that are devoid of this mantle. A likely location for the survival of Palaeolithic evidence, may be at shallow depth under the Lake Humber deposits east of Church Hill, where the mammalian material (reviewed above) suggests the existence of a buried surface, or closely superimposed surfaces, in a shallow valley that persisted from at least Oxygen Isotope Stage 7 until inundation beneath Lake Humber. T. Manby (pers. comm.) has recently identified a possible piece of an Acheulian hand-axe in the Routledge collection, but its find-spot is unknown.

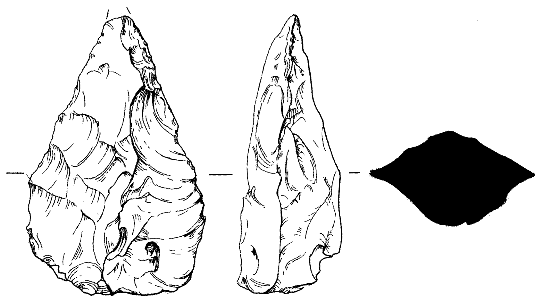

Figure 4 Hotham hand-axe. Scale 1:3

Mesolithic (Figs 5-7; Pls 2-3)

By the 11th millennium BC, ridges of Aeolian sand had formed over some peat deposits on the eastern side of the Vale of York at the foot of the Wolds. This is recorded in a test-pit at Low Grange Farm, Shiptonthorpe (SE 4849 4405), and dated to 11873 -11216 cal BC (2 sigma: HAR 6086. Pers. comm. B. Furness and S. King). Between these sandy ridges, a series of reed-swamps ran along the present course of the Foulness Valley, which by the later Mesolithic was transformed into a series of freshwater lakes. The areas of peat where these lakes once were are recorded on soil maps, and are particularly extensive at Wholsea, Hotham Carrs and Everingham Carrs – with smaller areas between the sand ridges at Hasholme and Bursea. The historic place-names of Wholsea, Bursea, and Seaton Ross, all contain the element "sea" which refers to former lakes (Smith 1937), or

Plate 1 Aerial photograph of the Bielsbeck area. The pond in which original finds were made is in the rear centre. Crop-marks of later river courses can be seen in the foreground

islands in marshy land (Watts *et al.* 2004, 103). These names can be paralleled by Hornsea and Skipsea in Holderness, where meres (all now drained, apart from Hornsea) have yielded Mesolithic palaeo-environmental data and artefacts (Gilbertson 1990, 98). The pollen analyses undertaken by Innes *et al.* along the Foulness valley (see Section 2.3 below) and Turner (1987, 87) at Hasholme, indicate wetland vegetation of fen carr, reed swamp and sedge marsh, with the margins wooded with alder, birch, hazel and some oak. These environments would have provided a suitable habitat for wildfowl and other large game, and be potentially a rich food-resource for a hunter-gatherer economy.

Early Mesolithic people were active in all parts of the East Yorkshire landscape, but the location of major sites around lowland water bodies, suggested by early research, remains a central theme, and the classic sites of Star Carr and Flixton (in the Vale of Pickering), and Brandesburton and Skipsea (in Holderness) are still powerful paradigms for the period (Ellis *et al.* 1993). The development of dense forest in the early Holocene (Beckett 1981; Gilbertson 1984b) did present economic problems to hunter-gatherer economies, which were solved in part by the exploitation of the diversity of resources and landscape provided by lakes and other wetlands. It is very likely that major early Mesolithic sites lie preserved within the wetland sediments of the Foulness valley; however, the environmental relations of the Mesolithic have recently undergone reappraisal, and it is becoming apparent that early Mesolithic land-use was

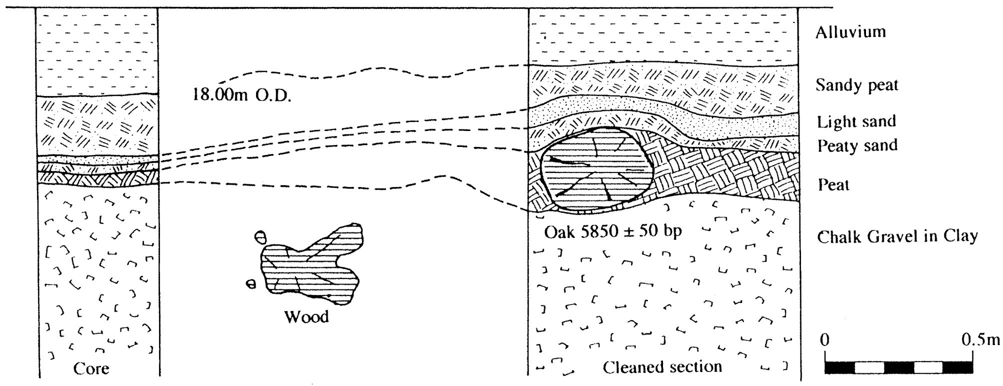

Figure 5 A section across the culvert at Market Weighton Beck, showing the Mesolithic naturally felled oak

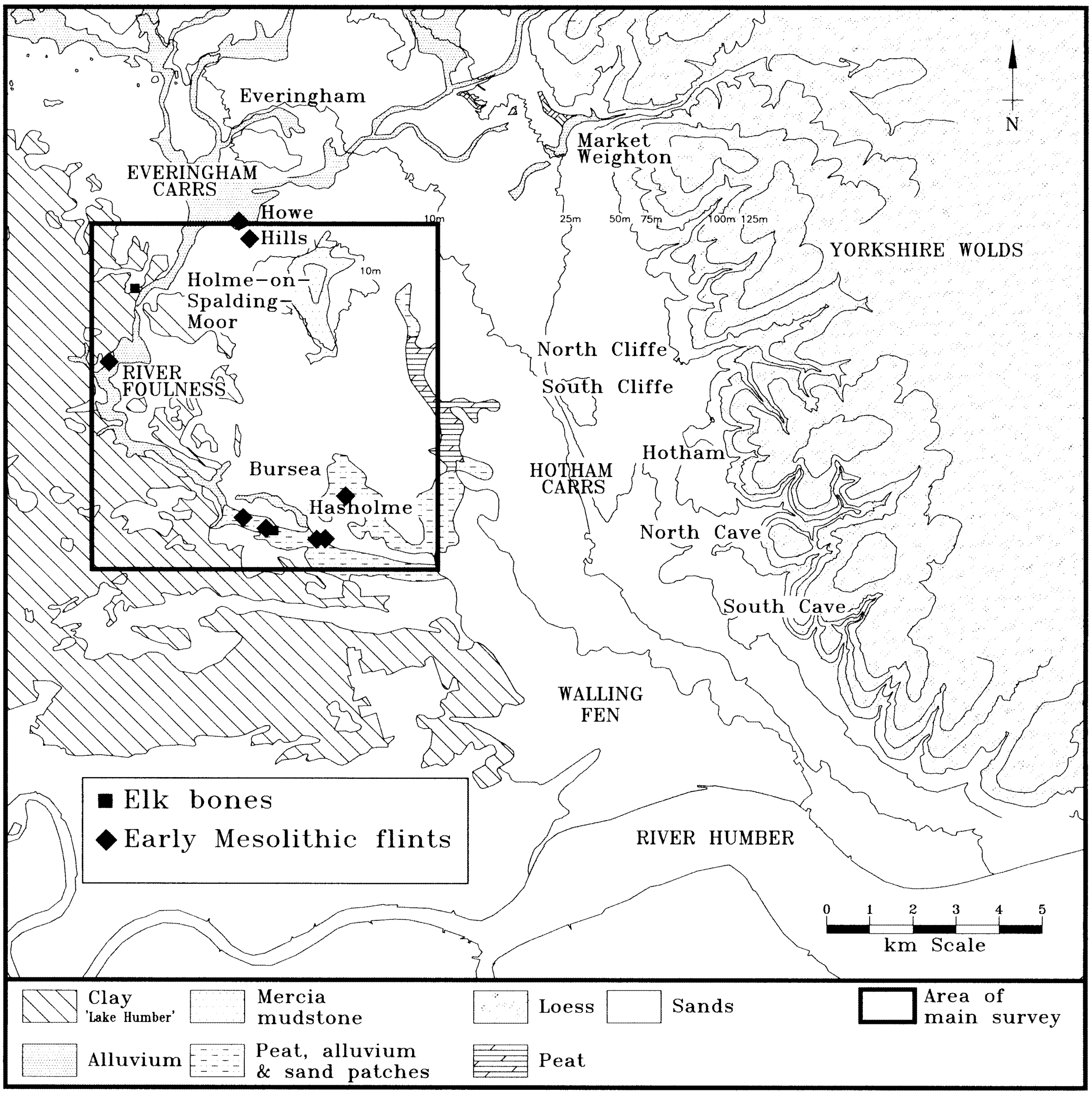

Figure 6 Distribution of early Mesolithic finds, against a generalized map of sediment types (based on King and Bradley 1987)

more complex than previously thought – perhaps involving local modification of the lake-edge environment near to settlements using fire (Bennett *et al.* 1990). Detailed work around Star Carr supports this suggestion (Cloutman and Smith 1988; Day 1996; Day and Mellars 1994), and early Holocene layers of charcoal and eroded soil have been identified, in association with pollen evidence for forest-opening in the lower valleys of the North York Moors (Jones 1976; Innes and Simmons 1988). If the interpretations of findings at Willow Garth, Boynton (Bush 1988) are accepted, considerable early Mesolithic impacts may have occurred on the Wolds, although this evidence remains equivocal (Day 1996). Early Mesolithic sediments of the Foulness valley await detailed study in relation to identifiable archaeological sites.

In the study area, there were extensive freshwater systems throughout the early Mesolithic, comprising substantial lakes, fringed by reed-swamp and fen, directly analogous to the situation existing in the Vale of Pickering (Schadla-Hall 1988; 1989; Conneller and Schadla-Hall 2003), and in Holderness (Dinnin and Lillie 1995), which should have provided a focus for activity (Fig. 6).

Faunal evidence has been recovered along the Foulness valley during drainage work at several locations. Elk bones *(Alces alces)*, likely to be of Mesolithic date, have been found in peat in the carrs, both at Bursea House (SE 8121 3290) and Holme House (SE 780 385), at a depth of at least 1m. Further up the valley, well-preserved bones of a relatively elderly red deer *(Cervus elaphus)* and dog were also discovered during a watching brief, when a lagoon was excavated, where the Market Weighton by-pass crossed Market Weighton Beck (SE 8702 4010). The bones, which were found at the base of the peat, just above the gravel, were unarticulated (see Section 2.2 below), and may have been re-deposited from upstream.

A naturally-felled oak found close by, during the culverting of Market Weighton Beck (at SE 8708 4110), in the same layer of peat, provided a possible date for the red deer

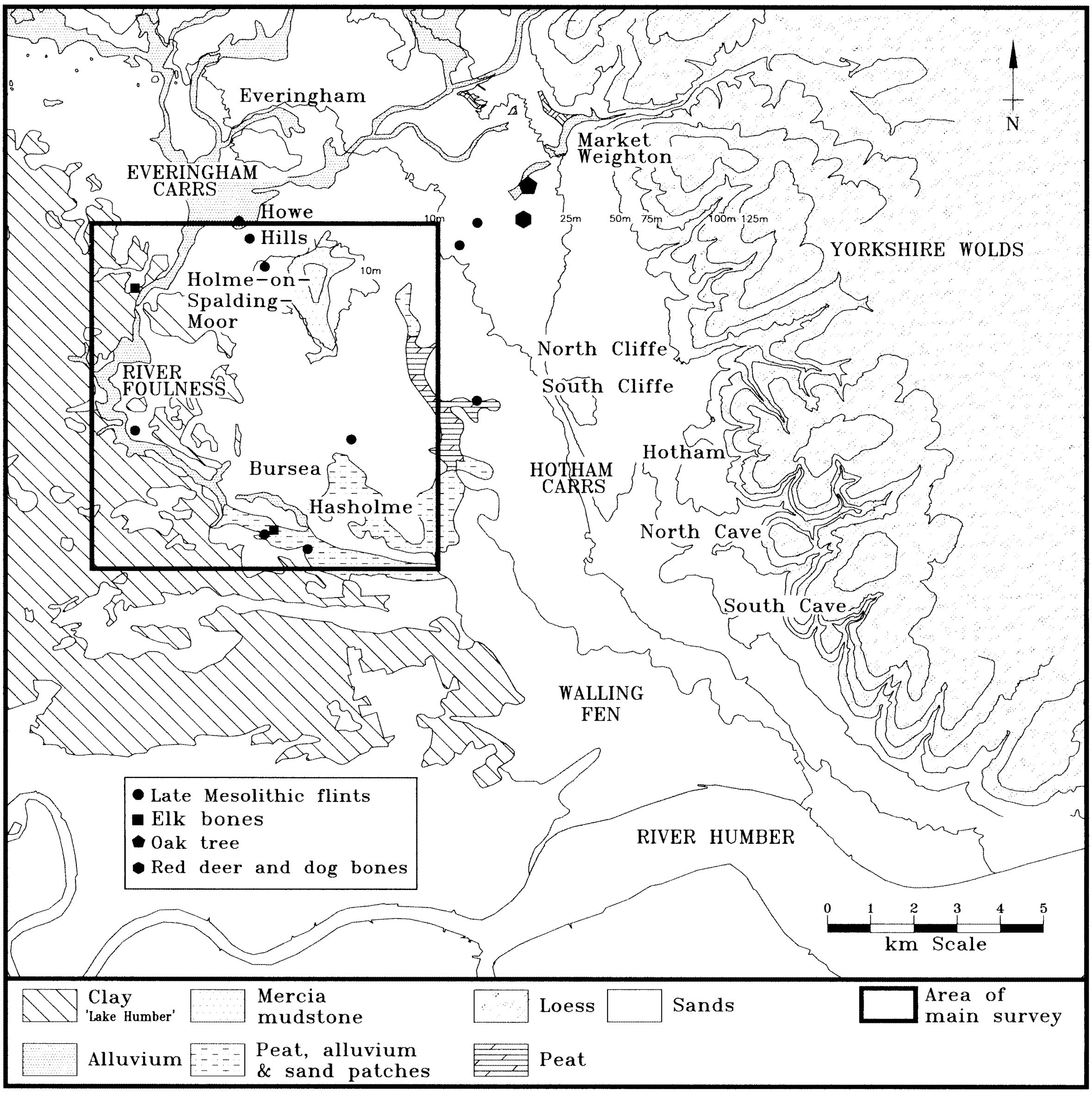

Figure 7 Distribution of later Mesolithic finds, against a generalized map of sediment types (based on King and Bradley 1987)

and dog bones. A section of the culvert trench was prepared and sampled for insect remains, and a slice of the tree-trunk removed and taken for dendrochronological analysis (Fig. 5). Although the rings could not be matched, a C14 date of 4834 – 4576 cal BC (2 Sigma: GU5001) was obtained from the 113-133 rings of the 221 present – placing it in the later Mesolithic. Although no corresponding evidence of human material culture was found during the watching brief and nearby excavation, the fact that the peat deposits along Market Weighton Beck preserved bones of this period is most important.

Further south along the valley, Mesolithic assemblages have been found in 14 locations during field-walking as part of this project, bringing the total number (when combined with the finds of earlier workers: see Wymer and Bonsall, 1977) to 23, within a 12 x 12km area (Figs 6-7).

The most important early Mesolithic assemblage in the study area has been found at Howe Hill, Everingham, where later Mesolithic and early Neolithic artefact types have also been recovered (Pl. 9). The 1st edition OS map (1854) shows three prominent sand hills – two to the north, and one to the south of the River Foulness. The three hills would have been small islands, or "holmes" in the former marshland of Everingham Carrs, forming excellent vantage points for hunting, and providing a place of refuge. Sadly, less than a quarter of one of these – Howe Hill, Holme-on-Spalding Moor, which rises over 10m OD, and was once about 50m across – still remains (Pl. 2); the others have been removed by agriculture and quarrying.

Before its destruction, the archaeological importance of Howe Hill, Everingham, was recognised in 1968, by Mr and Mrs Cutts, who found three obliquely blunted points on the sand dune during a bird-watching expedition. They informed John Bartlett of this discovery, and in 1970, members of E.R.A.S. carried out surface collection and a limited excavation. A large amount of Mesolithic flint debris was found, and a blackened layer of organic material was observed in the sand. The microliths from this site

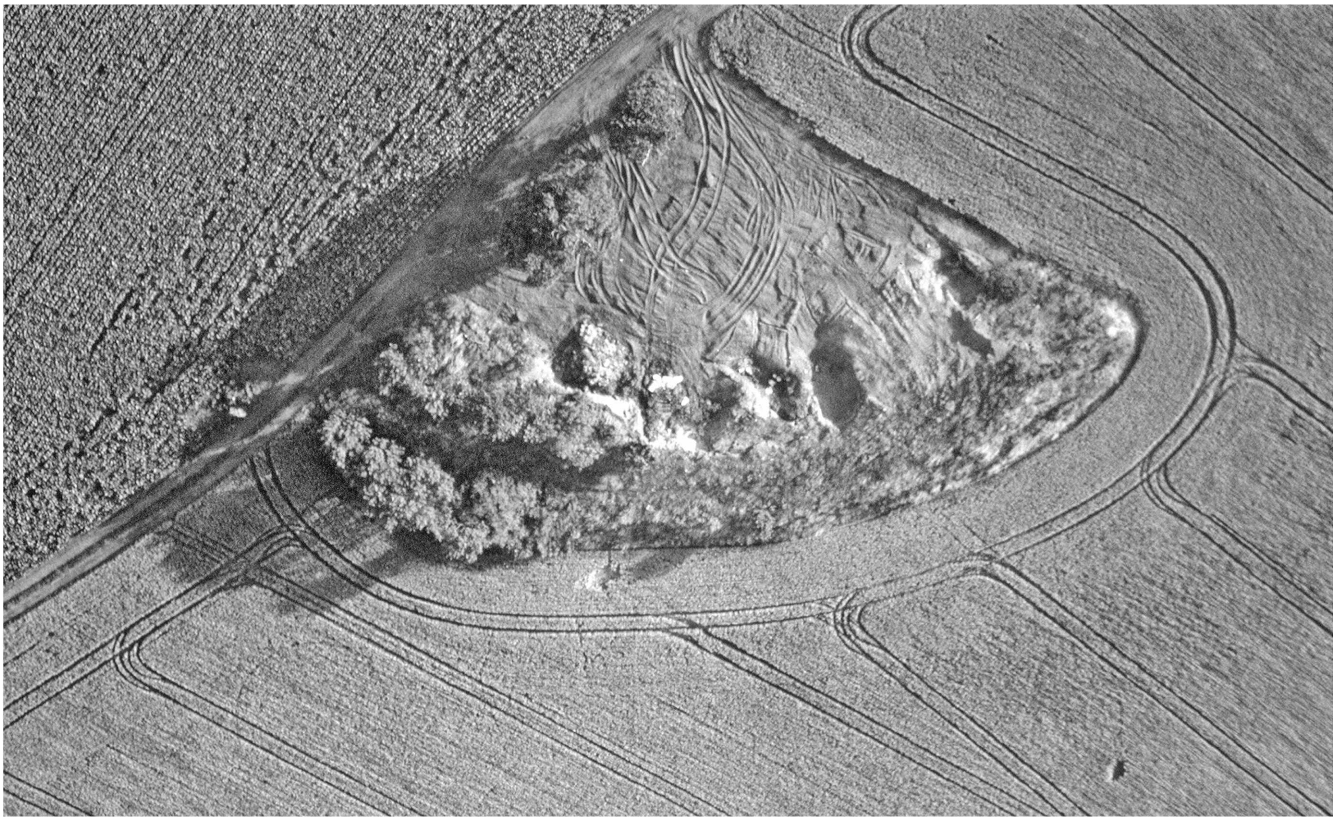

Plate 2 Aerial photograph of Howe Hill, Holme-on-Spalding Moor

belong to an early Mesolithic series, and appear to be of Mellars (1976) type B, in which obliquely blunted points predominate amongst the microlithic forms (see Section 3.3, below): no micro-burins were recovered in the surface collection.

John Bartlett found further Mesolithic flints on Howe Hill, Holme-on-Spalding Moor in 1970. The site was visited as part of the Holme survey in 1983, though by this time a quarter of the hill had been quarried away. The white and yellow sands were covered by scrubby grass and broom, and rabbits had been burrowing into the face of the quarried portion. A large number of flint fragments were visible in the dark strip of topsoil, and a core, scraper and the tip of a brown flint blade were recovered. In April and September 1990 further worked flints were found, including several cores.

Because of the severe threat to the site, the whole hill-top was gridded in March 1991, and a contour survey was undertaken by Mr G. Bate; flints were collected from the surface, in a grid of 1m squares, running 45m E-W and 15m N-S. It was noticed that most of the flint was to be found on a sand horizon, directly beneath a dark humic layer, which appeared to be the original Mesolithic land surface – though the problem of drift and deflation processes influencing finds distribution must be borne in mind (Barton 1987). Concentrations of flint debris suggested that knapping had been carried out there, and further burnt stones (presumably from hearths) were also found. Although much of the top surface had been damaged, about a quarter of the remaining hill-top appeared undisturbed, and it is therefore likely that cultural material may remain *in situ*. On a further visit in November 1997, micro-blades and other debitage were collected, concentrated in an area to the west of the hill. Burnt cobbles were also visible, but further damage had taken place.

A further area was recognised in summer 1991, when Mr Mott discovered large numbers of worked flints at South Cliffe Common (SE 859 358 and SE 859 359), where the wind had eroded pond-like depressions in the sand ridges. There was much debitage associated with blade technology (see Fig. 20), and frequent cobble-like sandstone pebbles, which had been cracked by heating, and which may represent hearths. Aerial survey in 1995 showed that a former creek (Pl. 3) ran between the two main areas of flint concentration in this part of the Hotham Carrs SSSI. These alluvial deposits could provide great potential for further environmental research. Previous finds of microliths in North and South Cliffe (Wymer and Bonsall 1977), were made on sandy land associated with former lakes and streams, like those from Holme-on-Spalding Moor.

Table 2 and Fig. 6 show that the sand ridges (particularly, those near watercourses) were favoured during the early Mesolithic – especially at Hasholme Hall, Hasholme Grange, East Bursea Farm, Bursea House, and on the margins of Everingham Carrs. The few tranchet axes and picks (see Section 3.2, below), typical of this period, have no known connection with the flint-working sites. The comparison with the eastern Vale of Pickering has shown that activity was concentrated on sand margins and islands associated with lakes. At Seamer Carr (site K, in particular) it was noted that 'much of the early Mesolithic occupation was on top of an aeolian sand' (Schadla-Hall 1987, 52; 1988).

Elizabeth Healey has compared and contrasted the HLB flint industries with those of the Pennines and other lowland areas in Eastern Yorkshire and the Trent valley of North Lincolnshire (Jacobi 1978, 302; Myers 1989). There

Table 2 Mesolithic finds (See Figs 6 and 7)

Early Mesolithic **Site name**	**NGR (SE)**	**artefacts**	**method of discovery**	**context**	**Acc. number**	**illustration number**
Holme House	774368	cores	line walking	sand ridge near relict stream		
Howe Hill (Ev)	80404006	microliths, scrapers, blades cores	surface collection	sand hill	KINCM:76.69	1,2,3
Howe Hill (HSM)	80653965	microliths, scrapers, blades cores, tranchet axe	surface collection gridded survey	sand hill	KINCM:70.30	5,4,6,10
Bursea House	81033295	blades	surface collection	sand hill, below which are buried land surfaces with reeds and peat		12
East Bursea Farm	805332	blade, core tranchet axe (illustrated)	surface collection	sand ridge near former watercourse		19
Hasholme, Pot Field	822327	blades, truncated blades	excavation	sand ridges		22,31,33
Hasholme Hills	82873370	truncated blade	gridded survey	isolated sand hills. Horse teeth also found		34
Hasholme Grange	82403271	core	surface collection	sand ridge		38
Hasholme Grange	82403271	blade	surface collection	sand ridge		38,39,40, 60
Holme	?	tranchet axe	chance find		YM1951.47.17	
Holme area	?	microliths, micro-burin scrapers, 29 other pieces	?		YM Williams	
Holme area	Cave Lane	cores, microliths, micro-burin	surface collection		YM Williams	
Holme area	?	tranchet axe	from Holme County Primary School Museum			
Later Mesolithic Arglam Grange	780352	blades	line walking	sand ridge		
Bloomhill Farm	80993280	blade	surface collection	sand hill top		
Howe Hill (HSM)	80653965	geometric microliths scraper, blades	gridded survey	sand hill		7,8,9
Howe Hill (Ev)	80404006	geometric microliths	surface collection	sand hill		
Holme	810390	microliths, scrapers				
Market Weighton	85914002	microliths	surface collection	sand dune	YM Williams	
Tollingham	830350	microliths		sand hill	BM1946.10.12.4	
Riverhead	8539	microliths	surface collection	sand hill	YM Williams	
South Cliffe	859359	blade	surface collection	sandy heath		
Yokefleet Grange	81993246	blades	surface collection	sand hill		

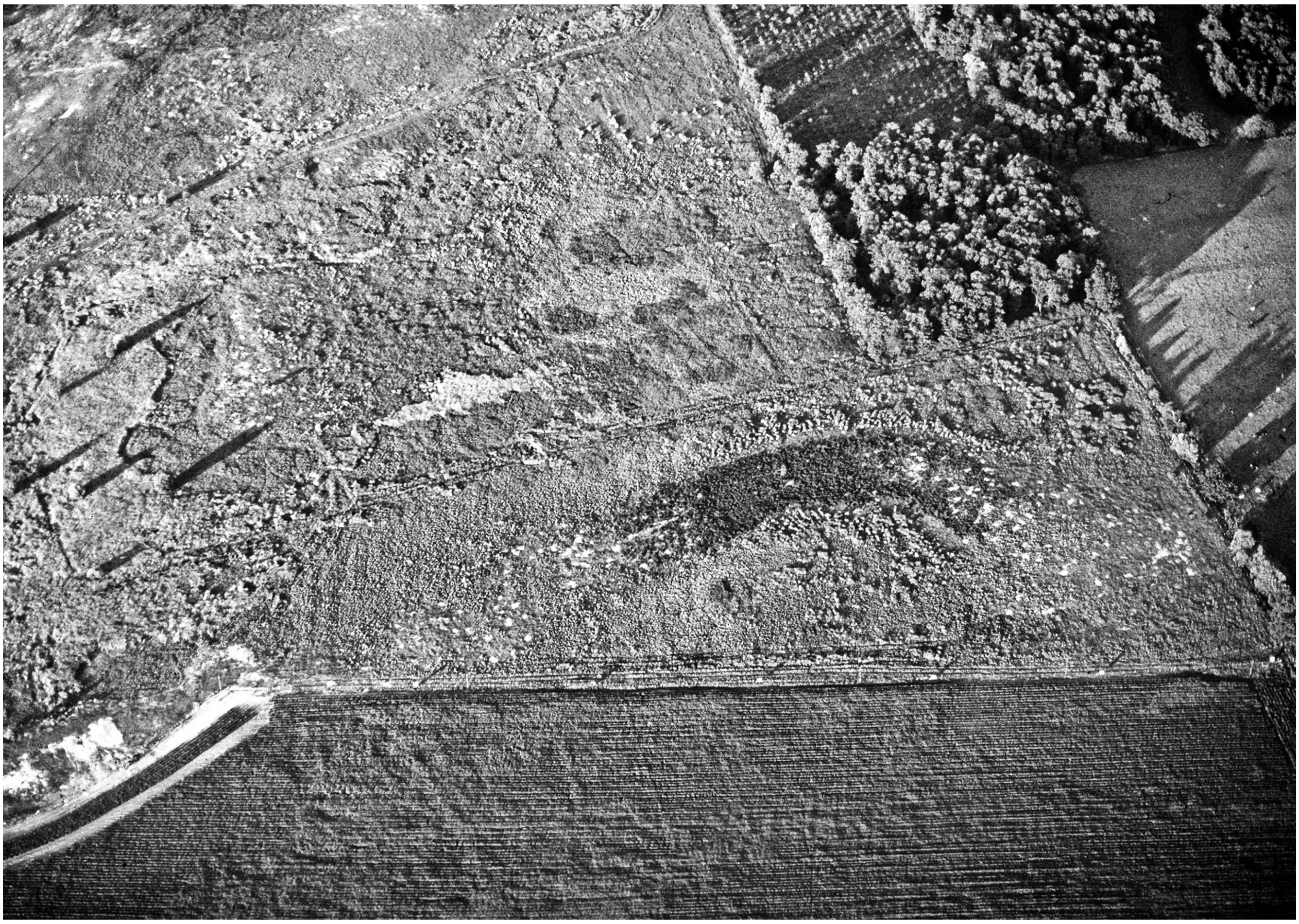

Plate 3 Aerial photograph of South Cliffe Common showing a relict stream

are variations in the tool kits between the upland sites (Jacobi 1978, 321ff), and differences in the proportions of the debitage categories noted (Myers 1989, 145ff), which are likely to reflect both raw-material availability and functional differences between these sites. She recognises that the sites in the HLB belong to the lowland facies industry, which includes Deepcar (Radley and Mellars 1964), Brigham (Manby 1966), Misterton (Buckland and Dalby 1973; Myers 1989, 215 ff.) and Willoughton (Armstrong 1932). No Mesolithic material is known from the southern Wolds to the east, though late Mesolithic assemblages are known from the Great Wold valley, and the central Wolds at Bessingby, Kilham and Thwing, and stray microliths and axes have been recovered from field-walking.

Regionally, early Mesolithic sites have been found further west in the Vale of York at Brayton, and at Topcliffe and Boroughbridge to the north (Wymer and Bonsall 1977). In North Lincolnshire, both early and later Mesolithic assemblages have been recovered from the cover sands at Risby Warren (Riley 1978), which, although higher above sea level, is a very similar aeolian sand environment to the SSSI site at Hotham Carrs. It has also been noted in Holderness that 'the hunter-gatherers appear mainly to have exploited the areas around the flowing mere systems and the estuarine inlets' (Head 1995, 321): this is also a similar site distribution to that found in the HLB.

Within the study area, there appear to be subtle differences in early and later Mesolithic flint artefact distributions (cf. figs 6 and 7). Both the Howe Hill sites have evidence for activity throughout the Mesolithic. Earlier Mesolithic sites do seem to be located right on the margins of the widest areas of peat and alluvium (Fig. 6), whilst the find-spots of later Mesolithic material are more widespread, and suggest activity on higher land away from lake-type environments (Fig. 7).

In a wider perspective, Healey (see Section 3.3, below) notes that the 'later Mesolithic activity pattern is different from that of the earlier Mesolithic, and consists largely of task-specific sites in upland areas', though there may also be some reuse of earlier material (Jacobi 1978; Myers 1989); the character and distribution of the HLB sites suggest that they too fit into this framework. She also commented that one would expect a substantial number of small narrow-blade geometric microliths, truncated blades, burins, awls, scrapers and a blade technology on a site of the later Mesolithic. Although there is only one geometric microlith from Howe Hill, Holme-on-Spalding Moor, amongst the new finds in the HLB, there are also a number amongst the collection from Everingham in Hull Museum. The small amount of material attributable to later Mesolithic activity recovered from the survey should not be a cause for concern, as the size of the artefacts (especially the microliths) makes them difficult to find in plough-soil, and therefore they are likely to be under-represented in a surface collection. The sites themselves tend to be small, discrete scatters, and only a small proportion of such artefacts is likely to be in surface contexts at any one time.

The environmental survey of the valley has shown that, as the later Mesolithic period progressed during the mid-Holocene, wetland successions increasingly caused the replacement of the mosaic of mere and fen by more homogeneous and less productive carr and bog conditions, in a similar way to that in the valleys of south Holderness (Dinnin and Lillie 1995). While locally meres would persist (perhaps seasonally), in general, carr and bog peats filled the valley, providing a much less attractive economic focus for Mesolithic foragers, and leading to the concentration of activity on higher ground (as suggested by the lithic data). A further reason for this move, may have been the marine transgression at the Mesolithic/Neolithic transition – as evidenced by the deposition of estuarine clays which overlie the peat at Hasholme and Sandholme Lodge (see Section 2.3, below). The shift to the drier ground would also be consistent with the systematic employment of fire as an ecological force during the later Mesolithic, with greater impacts on the woodland as a whole, leading to wider environmental consequences (Simmons and Innes 1987). The full development of deciduous forest in the mid-Holocene left the dryland landscape covered with oak, elm and hazel woodland, with pine on sandier soils on islands and uplands, and domination by alder in the valley bottoms – the Foulness being no exception (Section 2.3, below; Millett and McGrail 1987). Evidence for late Mesolithic forest disturbance, in the form of charcoal layers, is present in the Vale of Pickering at Seamer Carr and Flixton Carr (Cloutman 1988b), but, as yet, there is no analogous evidence from the Humber region.

The Neolithic (Figs 8-11; Pls 4-7)
East Yorkshire is well known for the wealth of its Neolithic archaeology on the chalk uplands (Manby *et al.* 2003, Chapter 6), and as Manby (1988, 35) remarks '. . . the expansion of arable farming that destroyed barrows and other monuments yielded a vast harvest of flint and stone artefacts', especially during the period of the land improvements instigated by the Sykes family on the Yorkshire Wolds. A combination of large-scale barrow-digging conducted from the 1840s until the end of the 19th century (Mortimer 1905; Greenwell and Rolleston 1877), and avid collecting, especially by J.R. and R. Mortimer (1905), who encouraged those working on the land to hand them their finds for a cash reward (Manby 1979), has resulted in the great density of stone tools known from the northern areas of the Yorkshire Wolds. The distribution of stone and flint axes across Yorkshire plotted on a 10km square grid (Manby 1979, fig 7) demonstrates the great number of finds from the northern and central Wolds. By contrast, the southern Yorkshire Wolds belongs to the 1-10 finds range, and the Vale of York has produced 0 to 5-10 axe blades per 10km square.

A further and more recent reason for prehistorians being drawn to study the Wolds is the susceptibility of their well-drained chalk, and associated gravels, to showing crop- and soil-marks. This attention on the Wolds has resulted in the RCHME survey, with its computer-rectified plots of crop-marks, covering *c.* 1300km^2, including the Lias Bench with the Southern Wolds (Stoertz 1997, Map 4). The most recent analyses of this vast data resource have been by John Dent (1995) and Peter Halkon (2006 and 2008) in their doctoral theses.

Flights over the sands and gravels of the south-eastern Vale of York by D.N. Riley and J. Pickering, especially in the 1970s, and air photography undertaken as part of the Holme Project have gone some way to extending coverage of the lowlands. The crop-mark evidence for the Holme-on-Spalding Moor area is discussed in full elsewhere (Halkon and Millett 1999).

Prior to the Holme Project, the only major attempt to collate data on Neolithic finds distribution specifically in the lowlands of the Vale of York was by Radley (1974). Although this work was largely based on museum collections, he did attempt to place Neolithic find-spots in the context of the Drift Geology and the present river system (Radley 1974, 11, fig. 1). Only seven axes were known from the project area, and Radley did notice the clustering of finds at Holme-on-Spalding Moor.

The most obvious Neolithic artefact types recovered from the HLB are stone and flint axes (Fig. 8). The tabulated axes include both light woodworking types and heavy axes suitable for felling trees; the majority of axe classes and materials used in Yorkshire are represented. Seventeen Neolithic stone and flint axes and adzes have been found so far in a block of land 6 x 9km, with a total of 30 in the larger area of the Foulness valley. Although 30 is a small concentration when compared to finds on the Yorkshire Wolds, it is possible to draw some conclusions from this distribution. Two fragments of flint axes were found at the Howe Hills sites during systematic archaeological recovery programmes. All the rest have been discovered during the course of agricultural work; the Graig Lwyd axe from Hasholme Hall, for example, was picked up by the writer during the potato harvest. The axes and adzes reached the Foulness valley from distant sources (see Section 3.4, below), and their distribution is shown in Fig. 8. The only significant petrology group not represented are the Cornish axes of Group I.

Cummins (1979), commenting on Neolithic stone axe distribution and trade in England and Wales, noted that light soils were likely to have been favoured: chalk and limestone in Yorkshire, Cambridgeshire and Wessex, and Carboniferous limestone in Derbyshire. This pattern was also observed by Radley (1974, 11, fig. 1) in his survey of the Vale of York as a whole; he also noted the apparent effect of the moraine and rivers on axe distribution. Most of the 20 Holme area axes and adzes, where precise provenance is known, were found on light, better drained soils. Of these, 13 are close to the alluvium of the River Foulness, and there appears to be a second clustering on the eastern side of the Foulness valley, away from the main watercourses and wetland areas.

Several of the axes from the Holme area show little signs of wear, especially, a Group XVIII example (S5; Fig. 23 and Pl. 4) found at Hasholme Carr Farm, and are therefore unlikely to have been used for woodworking. Flint axe FI is similarly unworn, and is of a type rare in Yorkshire, being more common in Lincolnshire and the Trent basin, but having East Anglia as the type's core region of distribution. The fine quality flint adze F4 (Fig. 22 and Pl. 5), also discovered at Hasholme Carr Farm by Mr A. Morton, equates with the prestigious class of later Neolithic flint-work represented by the large adze from Duggleby Howe (Kinnes *et al.* 1983) and the Seamer type axe (Edmonds 1995). Manby also notes an ovoid mace-head in flint from Hotham (Manby 1974) and a further Seamer-type axe from South Cave. The Holme adze F4 is therefore amongst a class more likely to have had a function related to status or ceremony, rather than carpentry. They may belong to the series of "stone axes of non-local, even continental origin, found in unexpectedly high proportions in springs,

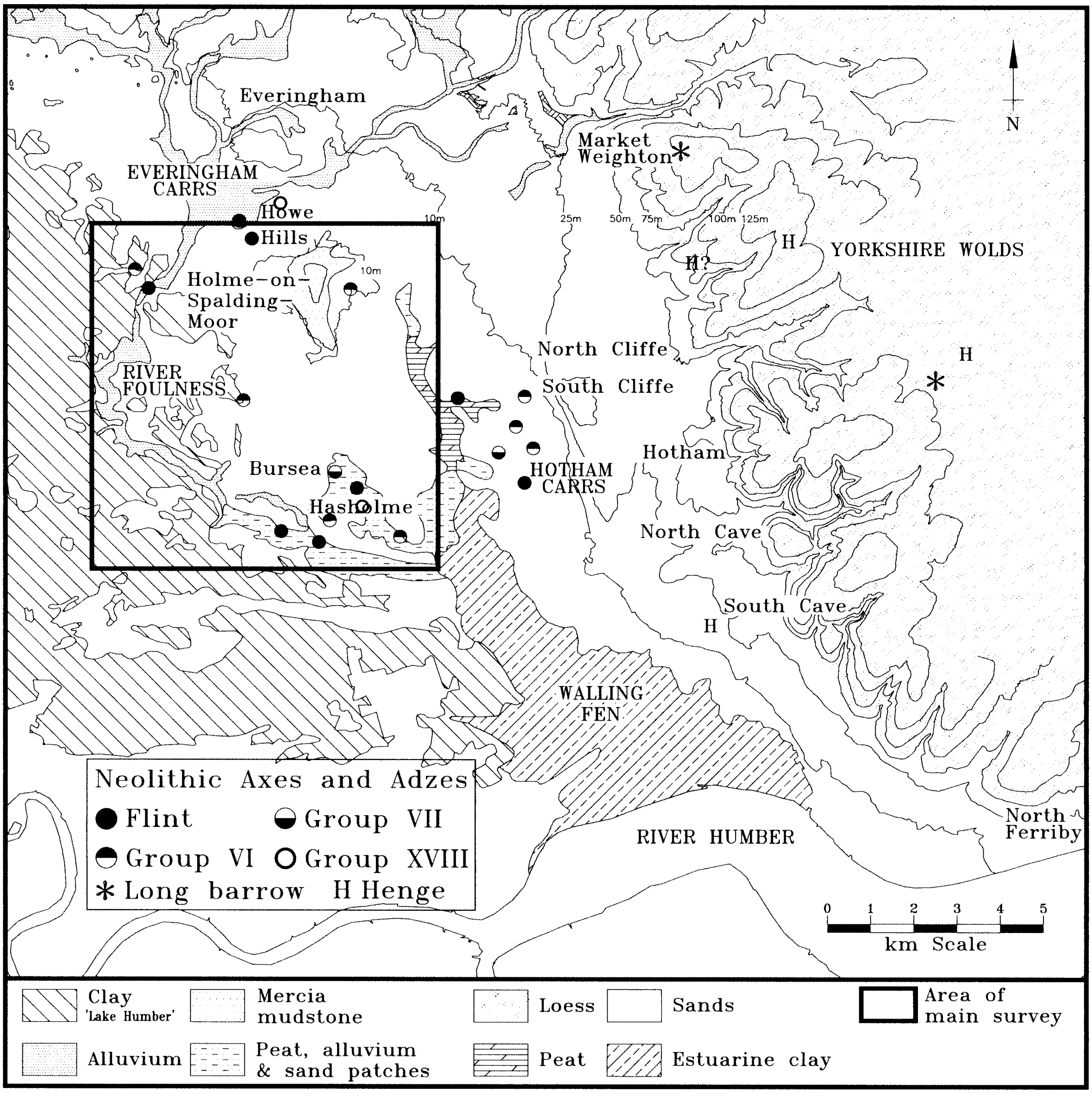

Figure 8 Distribution of stone and flint axes and adzes, against a generalized map of sediment types (based on King and Bradley 1987)

bogs and rivers in Britain" (Bradley 1990, 66-7; Bradley and Edmonds 1993, 49). Such "axes deposited in rivers may have acted as gifts to the gods" (*ibid.*, 204).

A further interpretation of their distribution is that they represent losses connected with woodland clearance in preparation for cultivation. Dent (1995, 23) in reviewing the Neolithic period on the Yorkshire Wolds notes that "the evidence for such clearances should come most graphically from broken stone axes, but such fragments and flakes tend to have come from archaeological excavations which have already focused on a known site. Random finds, or results of field-walking include a large number of complete axes, which should raise some suspicion with regard to the nature of their deposition".

Altermatively, the axe distribution may represent woodland management or exploitation for timber products. The palaeobotanical evidence for Neolithic impacts on the woodland, which might involve axe use, is spatially very variable in the Humber region, and is mostly very limited. The creation of small clearings for early agriculture is likely to have had only local impacts, and is therefore of only low visibility on pollen diagrams, unless the activity occurred very close to the pollen site itself. Dense woodland vegetation, particularly in wet valley bottoms with carr development, tends to filter out extra-local pollen and mask the environmental signal. It is not surprising that the short Sandholme Lodge pollen diagram (Section 2.3; Fig. 16) contains no evidence of human activity, although Turner's (1987) Hasholme analyses identified subtle changes in tree-pollen percentages which may indicate some woodland management, such as coppicing, rather than actual clearance for agriculture. Comparable management activity in Holderness has been postulated by Gilbertson (1984a; 1990) around Skipsea Withow Mere, where worked alder wood has been dated to 3771 – 3370 cal BC (2 Sigma), during a regional phase in Holderness of low-intensity early Neolithic activity beginning around the elm decline (Flenley 1987), also recognised at Roos Bog, Hornsea Old Mere and Gransmoor Quarry (Beckett 1981), dated to 4030 – 3783 cal BC (2 Sigma), at the last site. The identification of beaver activity at Skipsea Withow (McAvoy 1995), however, gives grounds for caution, in interpreting the evidence for the

Plate 4 Dolerite (possibly Group XVIII) axe (S5) from Hasholme Carr Farm. Note the stain across the centre of the axe caused by the decayed haft

Plate 5 Flint adze from Hasholme Carr Farm

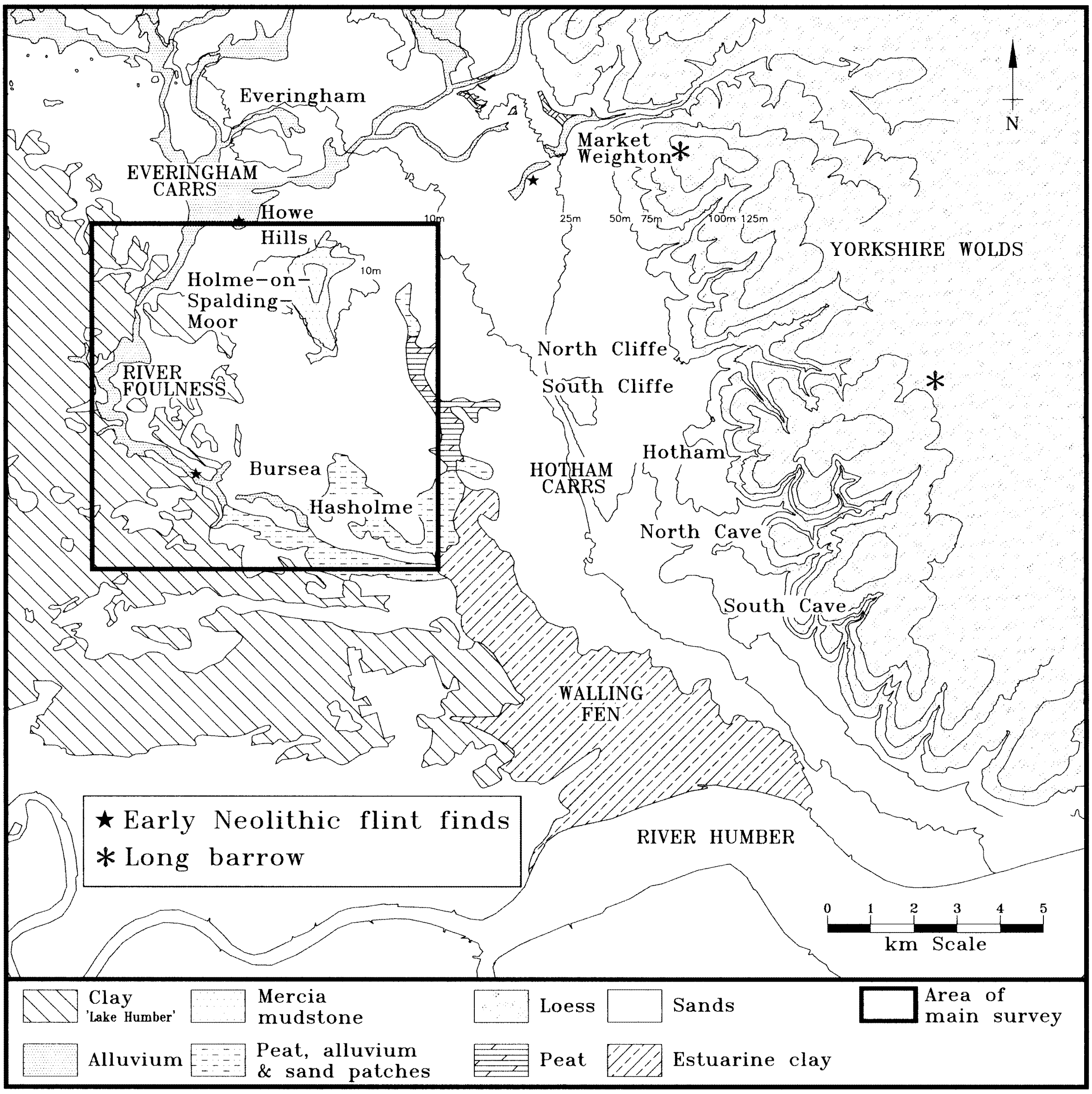

Figure 9 Distribution of early Neolithic finds, against a generalized map of sediment types (based on King and Bradley 1987). Note presence of estuarine deposits in the area of Walling Fen

human origins of woodland change. Only a single cereal pollen grain at Roos Bog provided evidence of Neolithic cultivation at the elm decline, and early Neolithic impacts in the west of the Humber region, as at Hatfield Moors (Smith 1958), are similarly very low scale.

There are clear indications, however, that later in favoured locations very intensive Neolithic clearance of woodland took place. At Skipsea Withow Mere (Gilbertson 1984b) an intense phase of mixed farming with cereals occurred in the Neolithic, which culminated in the burial of the sequence by colluvium, probably reflecting soil erosion caused by deforestation and farming. On the central Wolds two cultivation phases involving removal of woodland and regeneration to open grassland (Evans and Dimbleby 1976) preceded the creation of the Kilham long barrow, dated to 3938 – 3349 cal BC (Manby 1976). Similarly the Willerby Wold long barrow was constructed within a grassland landscape soon after 4211-3380 cal BC (2 Sigma) (Cornwall and Castell 1963; Manby 1988). At Willow Garth, in the Great Wold valley (Bush and Ellis 1987) it is clear that by *c.* 4000BP and the end of the Neolithic on the Wolds, the landscape had been effectively deforested. It seems clear that in the Neolithic, cultural activity leading to environmental change was significant but localised, and in the well wooded lowlands like the Foulness valley, palaeobotanical research has to be of high resolution, and located very close to areas of landscape, such as the sand islands and gravel ridges, where concentration of human agricultural activity was likely, in order to recognise it. Within the Foulness valley itself, therefore, woodland management would have been the norm, one possible product being coppiced wood for the construction of trackways across wet areas. According to Mr F. Hawcroft of Sikes House Farm, Spaldington, a brushwood trackway was discovered during the straightening of a bend in the River Foulness in the 1940s, but not properly recorded. There is no evidence as to its date, and timber trackways are known from later periods, as a medieval charter relating to Holme-on-Spalding Moor, dated AD

Table 3 Stone and flint axes and adzes * (Petrology after Clough and Cummins 1988)

Site Name	*NGR (SE)*	*Dimensions (cm)*	*Group**	*Light*	*Heavy*	*Adze*	*context*	*Acc number*	*illust no.*
Beacon Farm	82833861						sand hill	p	
Bunny Hill Farm	855360	13.3x4	Flint	D3			sand hill	p	F3
Bursea House	81393293		Flint	fragment			sand hill edge of peat	HM 35.70	
Harswell	841401		XVIII				sand hill near carr	p	S9
Hasholme Carr Farm	83253345	17.2x7.8	XVIII		C5		peat carr	p	S5
Hasholme Carr Farm	83183389	18.2x4	Flint			D7	sand rise edge of peat	p	F4
Hasholme Grange	82503312	11x5.1	VI	reworked B2a			sand rise next to former stream	p	S4
Hasholme Grange	8325	10.2x5.3	Flint	B2b				p	F2
Hasholme Hall	826343	15.3x7.3	VII		B2		sand rise	p	S3
Holme S.M	u	19						YM 1536. 1948	
Holme S.M	u	20	VI					YM 1951.47	
Holme S.M	u							BM Sturge	
Holme S.M	u							YM 1951.13	
Hotham	u		Flint					KINCM 26.62.1	
Hotham Carrs	87/34	11	Flint					KINCM 26.62.1	
Houghton	u	12	VI					YM 295.1948	
Howe Hill EV	80404006		Flint	fragment			sand hill	KINCM:30.70	
Howe Hill HSM	80703965		Flint	fragment			sand hill	KINCM:76.69	
Leylandii	783385	17.1x7	Flint		B2		sand hill next to carr land	p	F1
Leylandii	783385		unknown	axe lost			sand hill next to carr land	p	
North Cliffe	87/36	12	VI					YM1972.10	
Rose Villa	805359	10.2x5.9	VI	reworked B2a			sand rise	p	S2
Seaton Old Hall	780390	11x5	VI	B2c				p	S1
South Cliffe	872348	12.3x5.2	VI	B2c			sand ridge	p	S6
South Cliffe	868353	7.1x5.1	VI	B2a			sand ridge	p	S7
South Cliffe	864347	17.7x6.2	VII			B7	sand ridge		S8
Wholsea	84143272	10.9	VI				sand ridge on edge of peat carr	HM 60.70	
Wholsea	83953426	18					sand ridge	HM 59.70	
Wholsea			Flint					HM	

1230 to 1251, refers to a field known as Risebriggker (Clay 1965) – the derivation of this name has been given as a brushwood trackway (Smith 1937, 235). A post-Roman timber trackway was uncovered in early 2004 by the York Archaeological Trust, during the course of the construction of a new bridge and road improvements across the River Foulness at Welham Bridge (Dean 2005). Much earlier trackways have been investigated on the Humber Foreshore at Melton (Crowther 1987, Van De Noort and Ellis 1999, 230-7; Evans and Steedman 2001, 73-4).

The other main evidence of Neolithic material culture in the HLB comprises the flint artefacts found during field-walking. These are described by Healey (Section 3.3) and summarised in Table 4.

There is a lack of evidence for specific earlier Neolithic activity in the HLB, an absence which has been noted elsewhere (Healy 1987). Grimston-style pottery was however recorded from Howe Hill, Everingham (Manby 1988) during the work of Cutts and Bartlett referred to above, apparently from a settlement, rather than a mortuary context, along with a leaf-shaped arrowhead and a fragment of a ground flint axe. Neolithic flints were also found at

Table 4. Neolithic flint finds (See Figs 10 and 11)

Site name	NGR (SE)	artefacts	context	Acc. no	illust no
Earlier Neolithic					
Howe Hill, (Ev)	80404006	arrowhead (leaf) also sherds of Grimston Ware	sand hill	KINCM:30.1970	
Welham Bridge	79403420	arrowhead?	sand ridge near river		
Hawling Road Market Weighton	872410	arrowheads (leaf)	sand and gravel ridge at edge of Mkt Weighton Beck		
Later Neolithic					
East Bursea Farm	805335	flake	sand ridge		21
Hasholme Hall	81803300	flakes	isolated sand rise		27
Hasholme Carr Farm		knife			
Wholsea Grange	84903460	flake, scraper	sand hill next to relict stream		41
Bloomhill Farm	81013316	scraper, flake	alluvium		
Bursea House	81403293	scraper			16
Bursea House	811311	scraper	sand ridge		14
Bursea House	814334	scraper	sand ridge		17
East Bursea Farm	80853355	flake	sand ridge near relict stream		
Hasholme Grange	82453294	button core	sand hill near river		
Hasholme Hall	82873770	knives, scrapers, fabricators	sand hill		35-37
Sandy Camp	869359	scrapers	sand hill		
Skiff Farm	82803650	scraper, pot sherd	sand ridge		
South Cliffe	86103592	sickle, scrapers	eroded sand hill		59
Throlam Farm	821355	scraper	sand rise		
Wholsea Grange	845345	blade, scraper	sand rise next to relict stream		
Woodlands Farm	84313828	arrowhead (trans.)	sand plateau		43
undesignated					
Bramley Farm	810355				

Howe Hill, Holme-on-Spalding Moor, where there was evidence for later Mesolithic activity.

Further leaf-shaped arrowheads were found at Hawling Road, Market Weighton, on the sands. The fieldwork along the line of the Market Weighton By-pass provided an important opportunity to compare and contrast field-walked and excavated material. These flints were examined by A. J. Schofield (Section 3.4), and are tabulated below (Table 5).

A transverse arrowhead characteristic of later Neolithic assemblages was also found during the Market Weighton Bypass gridded survey. Schofield suggests that the presence of these arrowheads is characteristic of exploitation of the arm of the dendritic creek system, of which Market Weighton Beck was a part, by groups engaged in hunting and fishing on a seasonal basis, and that the assemblage represented here is fairly typical of a fenland type. The chipped flint artefacts have a dispersed distribution, apart from two clusters identified within the excavated area – one of these producing a thumb-nail scraper, characteristic of Beaker assemblages.

There is a contrast between the early and later Neolithic

Table 5 The three flint assemblages from Hawling Road (excluding arrowheads)

Method of Recovery	Number	Total mass	Mean mass	cores	core trim	primary	secondary	tertiary	chips	retouch
Line walk	20	53g	2.6g	0	4	0	0	6	10	4
Grid walk	9	60g	6.6g	1	1	0	1	4	1	5
Excavation	27	64g	2.3g	1	4	0	1	10	9	4

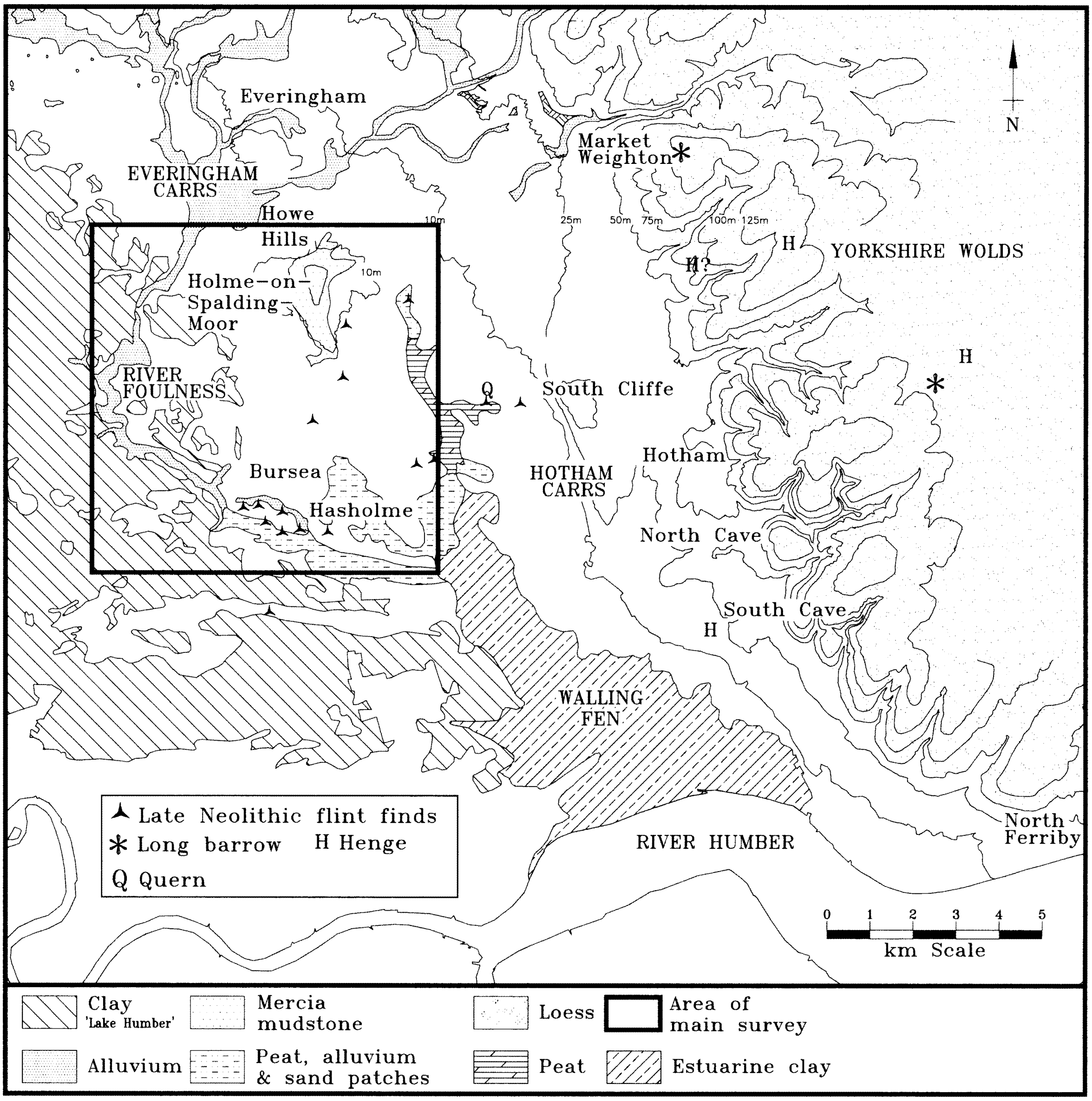

Figure 10 Distribution of later Neolithic flints, against a generalized map of sediment types (based on King and Bradley 1987)

activity within the landscape block analogous to that Holgate (1988, 105) has seen in the fluid nature of settlement in the earlier Neolithic of the Thames basin. He suggested that task-specific sites were located on the edges of river terraces or on the flood plains, with much of the landscape still being wooded, with domestic sites and monuments set in small woodland clearances. Perhaps much of the area along the Foulness was such a task-specific site – the tasks in this case being related both to woodland management and its products, and to hunting. It is interesting to note the presence of hazelnuts in the group of pits found during the excavation prior to the construction of the Teeside to Saltend Ethylene pipeline at Hayton, along with Woodlands Style Grooved Ware pottery and a contemporary assemblage of flint artefacts and animal bone (Halkon *et al.* 2000). Later Neolithic flint distribution in the Foulness valley (Fig. 10) shows an opening out of the landscape away from the river, especially along the sand ridges. Holgate (1988, 153) has also identified a similar later Neolithic settlement expansion onto lower valley slopes and terraces in the Thames Basin.

There is a concentration of later Neolithic material on the sandy ridges of heathland to the west of North and South Cliffe. Nineteen scrapers were found in three locations at the edges of a prominent sandy plateau formed at the 8m contour, near Sandy Camp plantation (SE 869 359) *c.* 500m x 300m in area. Such clusters of scrapers are generally taken to indicate home-based maintenance activity. A single-piece sickle fragment (no. 59, Section 3.3 below) was also found at South Cliffe Common, and a remarkable saddle quern (Fig. 11; Pl. 5) at SE 861 359. Mr Mott had noticed the top stone sticking through the eroding sandy heathland, and found that the lower stone lay beneath. The quern was identified by the late D. A. Spratt as being of local Jurassic sandstone, and a Neolithic date suggested. T. Manby recognised grooves on the upper stone as being like those formed by grinding stone axes (Pl. 6).

The difference between the clustered distribution of

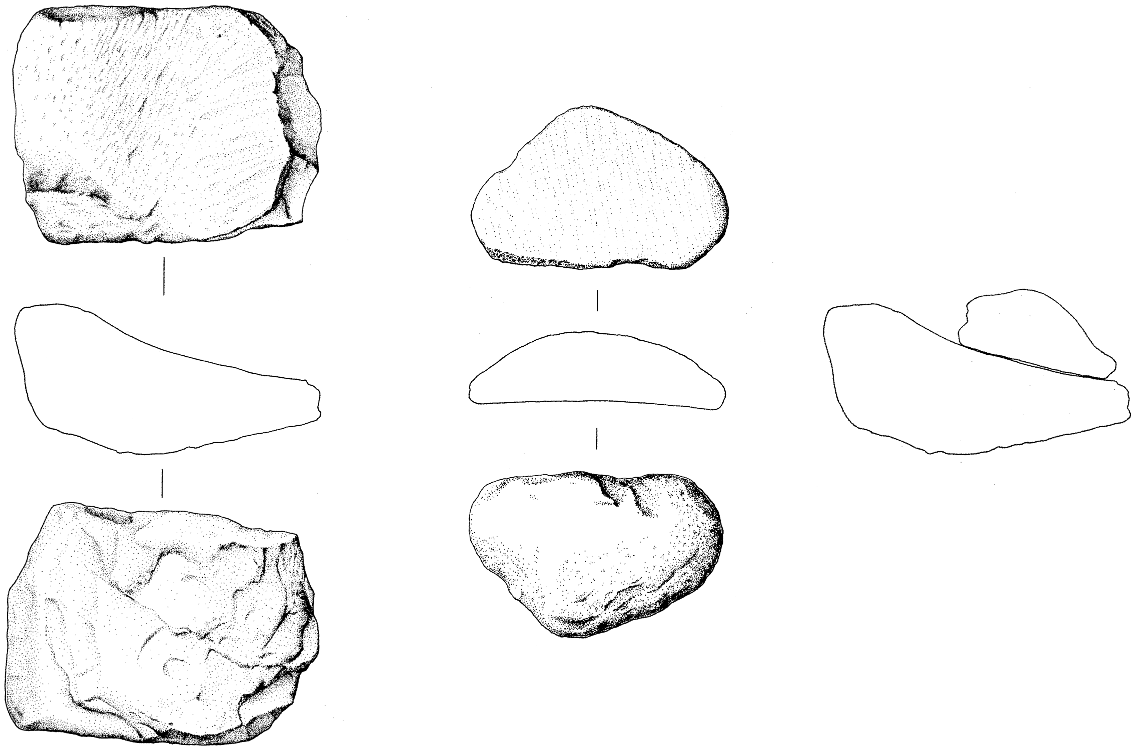

Figure 11 Saddle quern from South Cliffe Common. Scale 1:8

axes and adzes around South Cliffe (Fig. 8), and the linear pattern relating to the main route of the River Foulness between Everingham and Hasholme, has already been noted. This contrast, together with the concentration of scrapers referred to above, may demonstrate differences in land use between the two areas during the later Neolithic. The density of crop-marks is also greater to the east. Although many of the enclosures and field systems are likely to be of Iron Age and Romano-British date, there is an apparent coincidence of flints found during field-walking and crop-marks at Townend Farm, North Cliffe (SE 875 385), where a distinctive irregular curvilinear enclosure contrasts with the more regular Iron Age ones nearby, though the date of the enclosure would be confirmed only by excavation.

Although a quern and a sickle are slight evidence from which to reconstruct an agricultural system, the coincidence between sand soils and artefact distribution is significant. The sandy soils were easy to clear and work, but of limited fertility, and as in East Anglia (Lawson 1981, 62), became heathlands with the destruction of vegetation accelerating podzolisation. These areas often became medieval wastes.

West of the Foulness-Derwent watershed, the distribution of Neolithic artefacts is very thin across to the western edge of the Vale of York (Radley 1974). This is likely to be due to the relatively poor drainage of the clay soils and wide river flood-plains. Southwards in the peat and warped lands of the Humberhead Levels the situation is more complex due to the masking effect of some recent deposits; however, finds do cluster on the higher, sandy land, especially on the Isle of Axholme (Van De Noort and Ellis 1997).

There is some evidence for Neolithic burial or ritual monuments in the lowland areas, represented by two crop-mark curvilinear features that are possibly long barrows on the sand (Stoertz 1997, fig. 8). On the Wolds to the east of the HLB, a long barrow was excavated at Market Weighton Wold (SE 906 410; Pl. 7) by G. Rolleston in 1866 (Greenwell and Rolleston 1877; Kinnes and Longworth 1985; Kinnes 1992, 39). Its landscape setting on the western side of the southern Yorkshire Wolds provides a spectacular view of the Vale of York, which would have formed a backdrop for possible ceremonial activities here. With the usual east-west alignment, it is positioned at the head of a dry valley, Sancton Dale, which leads from the lowlands of the Foulness valley to the Wolds. This route, which links the Wolds upland with the Humber lowlands, would surely have been important, as palaeo-environmental evidence from Hasholme and Sandholme Lodge (see Section 2.3, below) shows that estuarine conditions prevailed in the latter region until *c.* 2886 – 2585 cal BC (2 Sigma) (SRR4743). The presence of such an environment would have opened up the range of estuarine resources, and commodities such as stone axes may have been brought in through this tidal inlet.

In contrast to the example from Market Weighton Wold, the Walkington Wold long barrow has an eastern aspect looking towards Holderness, and is one of a series of possible long barrows and long mortuary enclosures along the eastern edge of the exposed chalk outcrop (Stoertz 1997, figs 8 and 9). Dent (1995, 23) has noted how most of the long barrows excavated by Greenwell and Mortimer occupied the upper Wolds close to natural crossing-points, where the heads of the valleys penetrated close to the escarpment. Dent provides a further hypothesis: 'the traditional view is of the Wolds as (being) a barrow-encrusted massif surrounded by diverse and empty areas of low-lying land'. He goes on to suggest that 'if the position is reversed, with the majority of the prehistoric population inhabiting the lower ground and not the hill tops, the Wolds then become a barrier to

Plate 6 Saddle quern from South Cliffe Common. The two stones were originally found with the top and bottom stones *in situ*; the groove on top from polishing stone axes can clearly be seen

communication, across and along which there are a number of naturally selected routes, which tend to follow ridges and valleys'. The Neolithic evidence in the Foulness valley, however, does not suggest that there was a large population in this lowland region, though there does seem to be some expansion of activities in the later Neolithic.

So far, no cursus monuments or Great Barrows, comparable with Duggleby or Willy Howe, have been identified on the southern Wolds. At West End, South Cave, (SE 907 310) however, a crop-mark of a small henge-type ring-ditch has been photographed by P. Halkon, and also plotted by Stoertz (1997, Map 4). The feature appears similar to those described by Manby (1988, 66) and is situated on a sand and gravel plateau close to springs.

Mr Ian Chorlton has collected a number of scrapers and other flints at various places around South Cave, which have been identified by Elizabeth Healey (see Section 3.3 below) as being of later Neolithic or early Bronze Age date.

A concentration of monuments similar to the South Cave circular feature has been identified at Brantingham (SE 933 292; Stoertz 1997, fig. 32), situated on higher land overlooking Walling Fen, where recent field-work by Ken Oliver (pers. comm.) has resulted in the recovery of concentrations of later Neolithic worked flints in the vicinity.

The possible henge at Newbald (Loughlin and Miller 1979, 32) has been shown from geophysical survey by Mackey to be almost certainly geological in origin (see "Recent archaeological work in the East Riding", elsewhere in this volume).

1.4 The Bronze Age (Figs 12-13)

The positioning of monuments on the edges of higher ground, often at the head of dry valleys continued into the Bronze Age. Barrow and ring-ditch distribution on the southern Yorkshire Wolds can be divided broadly into two groups: firstly, those which have an eastern aspect looking towards Holderness, for example at Goodmanham, Etton, Bishop Burton, Cherry Burton (Greenwell and Rolleston 1877), and Walkington (Bartlett and Mackey 1972); and secondly those in the Newbald Lodge, Londesborough and Market Weighton Wold barrow groups (SE 908 413), which have a western aspect, overlooking the lowlands of the Vale of York. The southernmost of the Market Weighton Wold linear cemetery of at least 19 round barrows (Loughlin and Miller 1979, 116), is placed only 100m to the east of the long barrow. The ritual importance of this location was reinforced by further crop-marks observed by P. Halkon in August 1996, as a small round barrow had been placed exactly at the head of Sancton Dale, one of the main dry valleys leading up from the lowlands of the Vale of York. As in the Neolithic, the positioning of Bronze Age barrow groups is likely to have been influenced by such routeways. A further factor determining barrow distribution also appears to have been proximity to springs and streams, as comparison of maps of water sources (Lewin 1969) and round barrows shows. As on the Wolds flanking the Great Wold valley (Manby 1988; Manby *et al.* 2003, Chapter 6), the presence of large barrow groups comparable to that at Market Weighton Wold also implies that the landscape was cleared by the time of their erection.

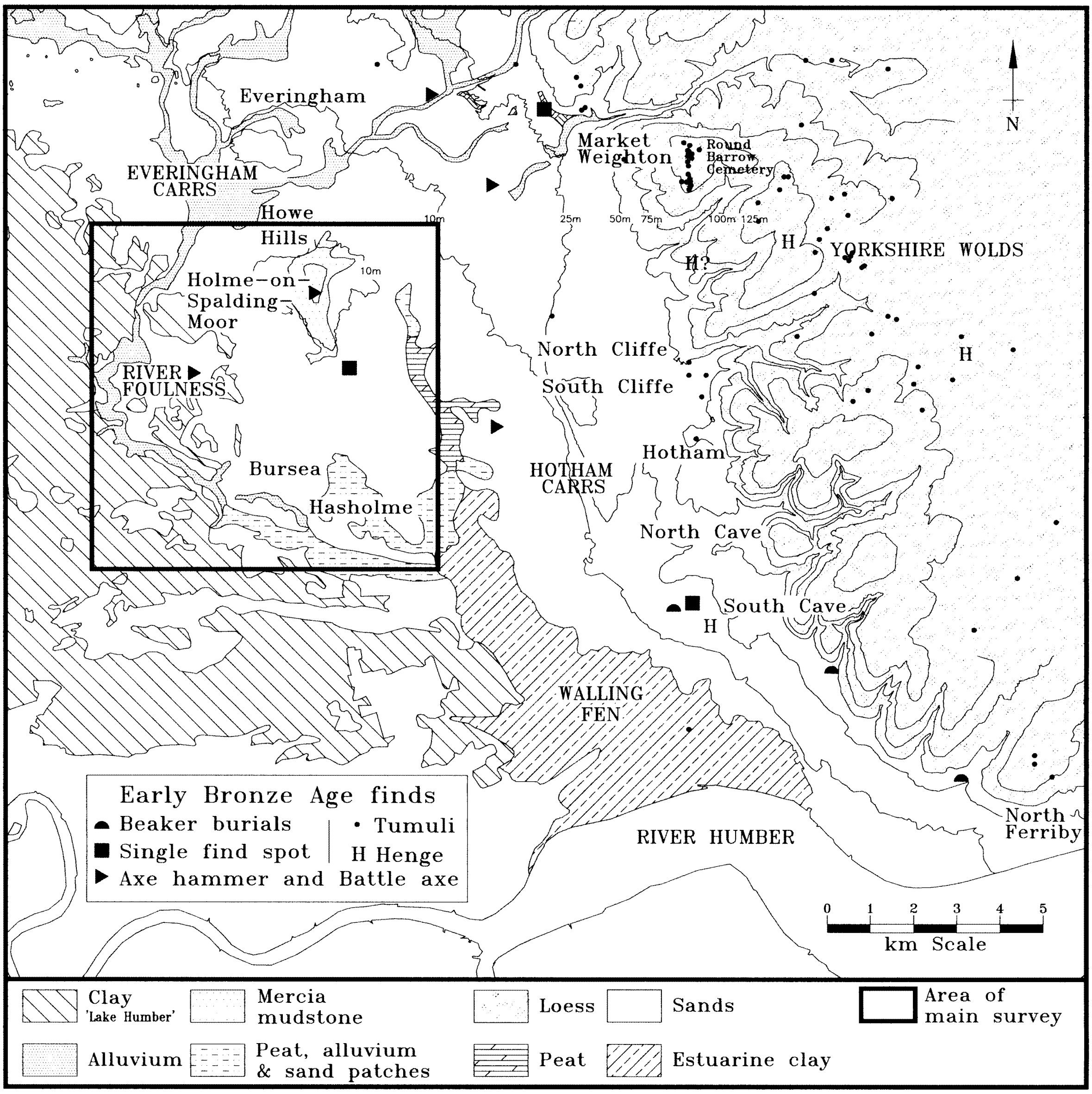

Figure 12 Distribution of early Bronze Age sites, against a generalized map of sediment types (based on King and Bradley 1987)

The Beakers, Food Vessels and burials, on the eastern edge of our study area, were found as a result of the commercial exploitation of fluvio-glacial gravel deposits (Sheppard 1902, 19; Bartlett 1963) along the Lias Bench; all are situated on higher ground overlooking what was to become the Walling Fen, apart from that at Faxfleet (see Table 6 and Fig. 12). Of particular note is the prestige burial from Brough-on-Humber (Kinnes and Longworth 1985, 143, UN 69; Sheppard 1929) which contained a Gerloff-type Armorico-British B type dagger (Gerloff 1975) and a bone quatrefoil-headed pin.

On the lowlands of the HLB, Beaker pottery and a barbed-and-tanged arrowhead (no. 24), found at Pot Field, Hasholme Hall during the excavation of 1970-2 (Hicks and Wilson 1975) may relate to the ring-ditches of ploughed-out round barrows; their position on a sand ridge on the edge of the valley of the River Foulness would be appropriate. In the similar topography of East Anglia, barrows are often found on the crests of such localised sand rises (Martin 1981, 87) and on light soils tightly grouped about rivers (*ibid.*, 77). Radley (1974) also noted a tendency for Bronze Age finds in the Vale of York to be located on dry ridges and river banks, and the distribution of artefacts and sites from this period found in the study area seems to bear out this hypothesis. Other artefact types associated with early Bronze Age activity, are axe-hammers and battle-axes (Roe 1966; 1968), listed in Table 6, all of which are unassociated surface finds. Of particular note is the example from Beacon Hill (Church Hill), Holme-on-Spalding Moor, with its view right across the Vale of York. Though so prominent within the landscape, few archaeological finds have been recorded on this hill-top. It is possible that there are prehistoric features underlying the rig and furrow which still covers part of the hill, or under the graveyard itself.

Early Bronze Age metalwork from the study area is not particularly common, but, one of the most impressive pieces is the halberd found at Sancton, "a spectacular example of early metalworking in Yorkshire" (Manby *et al.* 2003, fig

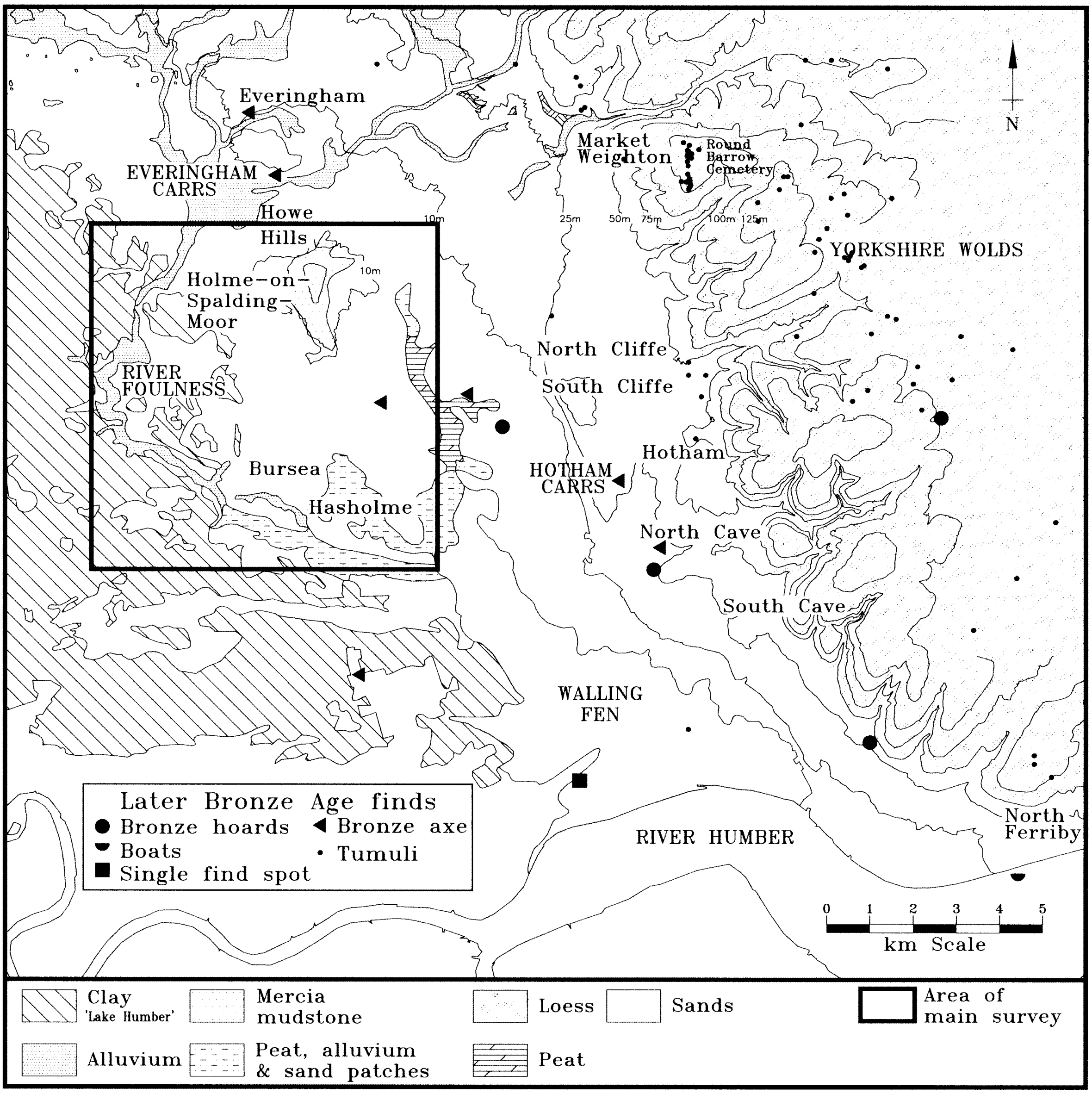

Figure 13 Distribution of later Bronze Age sites, against a generalized map of sediment types (based on King and Bradley 1987). Note absence of estuarine deposits in the area of Walling Fen

23, 60-1). In contrast, various middle and later Bronze Age metal artefacts have been discovered in and around the HLB (Fig. 13). The palstaves from Bunny Hill and Everingham (see Table 7) were found on sandy areas at the edge of the wetland. The Hotham Carr hoard (Sheppard 1941, 15; Burgess 1968; Manby *et al.* 2003, Chapter 6), the earliest of the local bronze implement hoards, may also have been associated with servicing woodland exploitation on the edges of the wetland. Belonging to the middle Bronze Age Taunton industrial phase, the remaining axes and palstave mould are part of what was a more extensive hoard. Moulds were also included in the 'bushel' of socketed axes found at Elloughton in 1719 (Briggs *et al.* 1987). At Everthorpe (KINCM 900.42.108) 13 socketed axes, a gouge and three lumps of copper cake were found (Sheppard 1923; 1926) in a gravel pit at either SE 902 320 or SE 896 318). All these finds show potential for metal-working being carried out along the western foot of the southern Wolds, clustering on the North bank of the River Humber. Further away from the estuary a small hoard of two Everthorpe type axes, three of Yorkshire type and an unclassified plain example, was found at Riplingham Park Farm (SE 9665 3551) by K. Oliver and J. Gallagher in 1994. It was suggested by A. Foxon, who helped with their excavation, that they had been strung together through the loops (pers. comm. K. Oliver).

After the end of barrow construction in the second half of the 2nd millennium BC (Manby 2003) the major type of field monument on the Yorkshire Wolds are the linear earthworks which divide the landscape (Mortimer 1905; Stoertz 1997, Halkon 2006 and 2008). As with the large barrow groups, this linear earthwork system implies that the uplands were cleared of woodland. It has also been suggested that the dyke systems relate to control of pasturage, water sources, and major routeways through the landscape (Dent 1995, 26; Fenton-Thomas 2003; Halkon 2006 and 2008). Similar systems exist in the North Yorkshire Moors (Spratt 1981; 1989). In contrast to the northern, central and western Wolds, the southern Wolds have a simpler axial system generally running north-south, represented by the Double Dykes of Newbald and the Wold Dyke of

Table 6 Early Bronze Age Finds

Early Bronze Age				
Site name	**NGR (SE)**	**finds**	**Access. no.**	**Reference**
Skiff Farm	8280 3650	scraper, pottery		
Hasholme Hall	822 328	arrowhead (B&T) beaker sherds		Hicks and Wilson 1975
Faxfleet	873 425	bipartite accessory cup incised decoration	KINCM 35.68	
Elloughton, Mill Hill		four Beakers represented by sherds		Sheppard 1929 Clarke 1970, no 1270 -1273
South Cave, Sandpit		beaker sherds	KINCM	Clarke no.1257-8
Everthorpe	9045 3103	food Vessel	KINCM 960/60	
Brantingham	941 296	beaker burial		
South Cave Kettlethorpe	9045 3103	beaker burial		Clarke no 1259
North Newbald		burial with food vessel and footed bowl	KINCM	Sheppard 1940 Manby 1969, 281-2
Brough		burial with Armorico-British bronze dagger and bone pin	Brit Mus WG 1852	Sheppard 1902 Kinnes and Longworth 1985; Gerloff 1975, no 125
Melton	971 271	beaker burial		Clarke 1970 no 1345
Beacon Hill HSM		axe hammer	BM 1922.3.1	
Hotham Carrs		axe-hammer	KINCM 300.42.299	Radley 1974
Lock Farm, Holme on S. Moor	8455 3930	axe-hammer		This paper, Fig. 24
Holme-on-S. Moor		battle-axe	Scunthorpe Mus AA83	
Shiptonthorpe, Home Farm		unperforated battle-axe	Bridlington Mus A580	
Mile House Farm, Mkt Weighton	864 409	battle-axe	p	
Sand Hill Farm, HSM	794 363	battle axe	p	
Howe Hill (HSM)	80655 3965	very fine scraper in till flint	p	

Goodmanham (Stoertz 1997, fig. 20). East-west divisions are less understood and investigated only at Walkington (Bartlett and Mackey 1972), where a rapier fragment and a biconical urn were associated finds. The dyke system extended down onto the Lias Bench and onto the lowlands below, for at South Cliffe (SE 875 355) triple dykes were recorded during aerial photography by J. Pickering and D. Riley. Field boundaries, which may date from this period, are also visible in the heathland of South Cliffe Common, running NW-SE from SE 860 358 to SE 858 361). There is an absence of such linear features within the HLB (Halkon and Millett 1999), a phenomenon also noted by Dent. The topography within the HLB at this time, where the sand ridges were divided naturally by areas of peat, clay and alluvium, meant that artificial division of the landscape was not necessary in most areas; however, aerial photography, and its collation as part of the English Heritage National Mapping Programme of the Vale of York (Horne and Kershaw forthcoming), have.identified cropmarks of linear earthworks near Shiptonthorpe and Thornton, both related to watercourses (Halkon 2006 and 2008).

A further explanation for linear earthwork distribution is one of alternative land use. The relative fall in sea-level during the Bronze Age led to a major period of peat formation, not only in the Foulness valley, but throughout the wetland areas of the Humber lowlands. This has provided a large body of pollen data for the period, which demonstrates that much of the heavily wooded, lowland areas remaining at the end of the Neolithic had been cleared by the end of the Bronze Age. Heavy woodland clearance for mixed farming with cereals is recorded at Hornsea Old Mere and Roos Bog (Beckett 1981). Late Bronze Age agriculture at Barmston in Holderness was accompanied by wooden structures (Varley 1968), and elsewhere in Holderness farming caused the capping of peat sequences in the meres by colluvial sedimentation following woodland clearance (Dinnin 1995). Deforestation in the Ancholme valley at Castlethorpe dated to 1896 – 1515 cal BC (2 Sigma) (Preece and Robinson 1984) also resulted in soil erosion and local colluviation. Nearer to the study area, clearance for mixed farming is recorded at North Ferriby (Buckland *et al.* 1990), and on Thorne and Hatfield Moors (Smith 1958; Smith 2002; Turner 1962), where a Bronze Age trackway, charcoal layers, a burned and chopped tree stump and pollen evidence, record human forest disturbance (Smith 1985; Dinnin 1997). There is also palaeobotanical evidence for clearance from Willow Garth (Bush and Ellis 1987) in the Great Wold valley. While conclusive evidence

Table 7 Later Bronze Age Finds. (See Illus. 19)

Later Bronze Age				
Gilberdyke		wing flanged axe type- Lissett	Yorkshire Mus 1123.1948	Schmidt and Burgess 1981 101, no629
Tollingham, HSM	835358	haft flanged axe type Ulrome	KINCM 900.42.10	Schmidt and Burgess 96, no 574
Holme area		wing flanged axe	Mortimer M1811	Radley 1974
Everingham, Southfield Farm	81064107	palstave Low flanged - type Kirtomy	(Radley 1974)	Schmidt and Burgess 1981, 83, no 500 A
Everingham	80454252	palstave		
Hotham	8934	palstave Low flanged - type Kirkcowan	(Sheppard 1923) BM WG 1852	Schmidt and Burgess 139. no 831 1981
Hotham Carr		palstave hoard with two-piece mould	(Sheppard 1941)	Burgess 1968, 4, fig 3 Schmidt and Burgess 1981, p 105 no 686 139,no 829-854 169, no 966-969 pl135A
Bunny Hill		palstave - transitional	Scunthorpe Museum	Manby 1980, 370 fig12.3
Everthorpe		socketed axe hoard with metal cakes	Mortimer M.92 Hull Mus	
North Cave		socketed axe - type Yorkshire	Mortimer M147	Schmidt and Burgess 236, no 1561
Newbald		socketed axe - type Hojby	Brit.Mus 100.7-19.5	Schmidt and Burgess 179, no1011
Broomfleet		socketed gouge (broken)	Hull Mus	
Elloughton		Ewart Park socketed axes and moulds		Briggs *et al.* 1987 Schmidt and Burgess 207&209, no1247 &1255
Everthorpe	902320 or 896318	13 socketed axes, gouge, copper lumps	KINCM900.42.108	Schmidt and Burgess1981, pp 219-20, 230, 244&250, no 1317-24, 1444-5, 1616&1662, pl 149.
Rowley	96653551	3 Irish bag-shaped & 4 Yorks socketed axes	pers comm K. Oliver	

is as yet lacking from the Foulness area, due to the dearth of detailed research, the regional picture makes it very likely that Bronze Age forest-clearance and agriculture were important features of landscape development.

The implied deforested landscape of the Wolds left the lowland areas near the River Foulness as the greatest remaining source of large timber for houses, boats and other forest products. Perhaps the palstaves and other bronze tools found on the sandy areas adjoining the wetlands relate to woodland resources, in the same way as the Neolithic polished stone axe finds. Indeed, Heath and Wagner (Section 2.4 below) recognise that localised clearance and grassland are indicated by the beetle evidence, but the number of species associated with dead wood, from Hasholme for example, shows that this woodland management was less all-embracing than today.

The large bog oaks found buried in the peat, when P. Halkon inspected drainage work at Hasholme Grange (SE 824 326) in April 1984, provide solid evidence for the presence of mature woodland engulfed by the spreading bog. Radio-carbon dating showed these to be Bronze Age in date, and indeed the Hasholme Boat itself was hewn from a tree which was 600 years old before being felled between 322 and 277 BC (Millett and McGrail 1987). The stratigraphic sequence at Hasholme Grange was confirmed during the excavation of a large irrigation pond in July 1996, as the thick structured peat contained well-preserved wood, including birch, alder and oak.

Within the region, therefore, there was an ample supply of large timber, the raw material for the Bronze Age boats found by the Wright brothers at North Ferriby on the Humber foreshore (Wright 1978; 1985; 1990; McGrail 1990). The environmental context of the Ferriby boats (Buckland *et al.* 1990, 143) indicates that beyond the inter-tidal mudflats of the Humber itself, there was estuarine vegetation giving way to wet oak-alder carr. Such an environment provided a habitat for red deer, as a portion of the skull of one such animal, with a fine set of antlers, was also found at Hasholme Grange (SE 8227 3259) at a depth of 1m in the same peat as the bog oaks. The butchered mandible of a red deer was found nearby during the Hasholme Boat excavation, in context 005 – bracketed between context 004 which has been dated to 1100-910 BC, and context 018a, which dated from 4710-4470 BC (HAR 705 -707) (Stallibrass 1987). The Coleopteran evidence (see Heath and Wagner, Section 2.4) suggests a mosaic of wetland habitats along the Foulness valley at this time, with the amount of woodland, as opposed to open terrain, varying from site to site. A general trend of less woodland further upstream can be perceived from the beetle species preserved, reflecting grassland conditions on the adjacent dry sand ridges.

Overlooking the upper part of these lowlands, at the

Plate 7 Aerial photograph of the Market Weighton long barrow (centre right). The central mound is visible as a light mark in the crop, the ditches as dark marks. The light linear feature to the left is the head of a dry valley, Sancton Dale

beginning of the 1st millennium BC, were a small number of hillforts, notably at Grimthorpe (Stead 1968), situated on a spur at the southern tip of the high escarpment of the Western Wolds. Faunal material at this site reflects the use of Wold pasturage, lowland meadows and forest for livestock rearing and hunting. The strategic position of the site and its position on the easiest routeway from the Wold foot up on to the high western Wolds have recently been discussed (Manby 2006; Halkon 2006).

In 1995 aerial photography by the RCHME based at York (Horne 2003) and P. Halkon in 1997, revealed a further hill-top enclosure at Mount Airy, near South Cave, positioned on a high spur overlooking the southernmost part of the Foulness valley and the Humber banks. The ditch cut off the promontory from the Wolds plateau to the east and a very steep slope provides natural defence to the west. Although there is no dating evidence for the site at present, from this position it would have been possible to observe and perhaps control activity over a wide area.

Closer to a creek of the Foulness system, a prominent sandy plateau at North Cliffe (SE 865 363) is partially enclosed by a series of large ditches which curve round the low hill-top. These ditches partially underlie a palimpsest of later features, which are Romano-British, judging from field-walking and typological comparison. The identification of vegetable-tempered later Bronze Age pottery (pers. comm. P. Didsbury) collected during field-walking here makes Bronze Age activity likely.

At the end of the Bronze Age palaeo-environmental evidence shows that in the Holme area, water levels

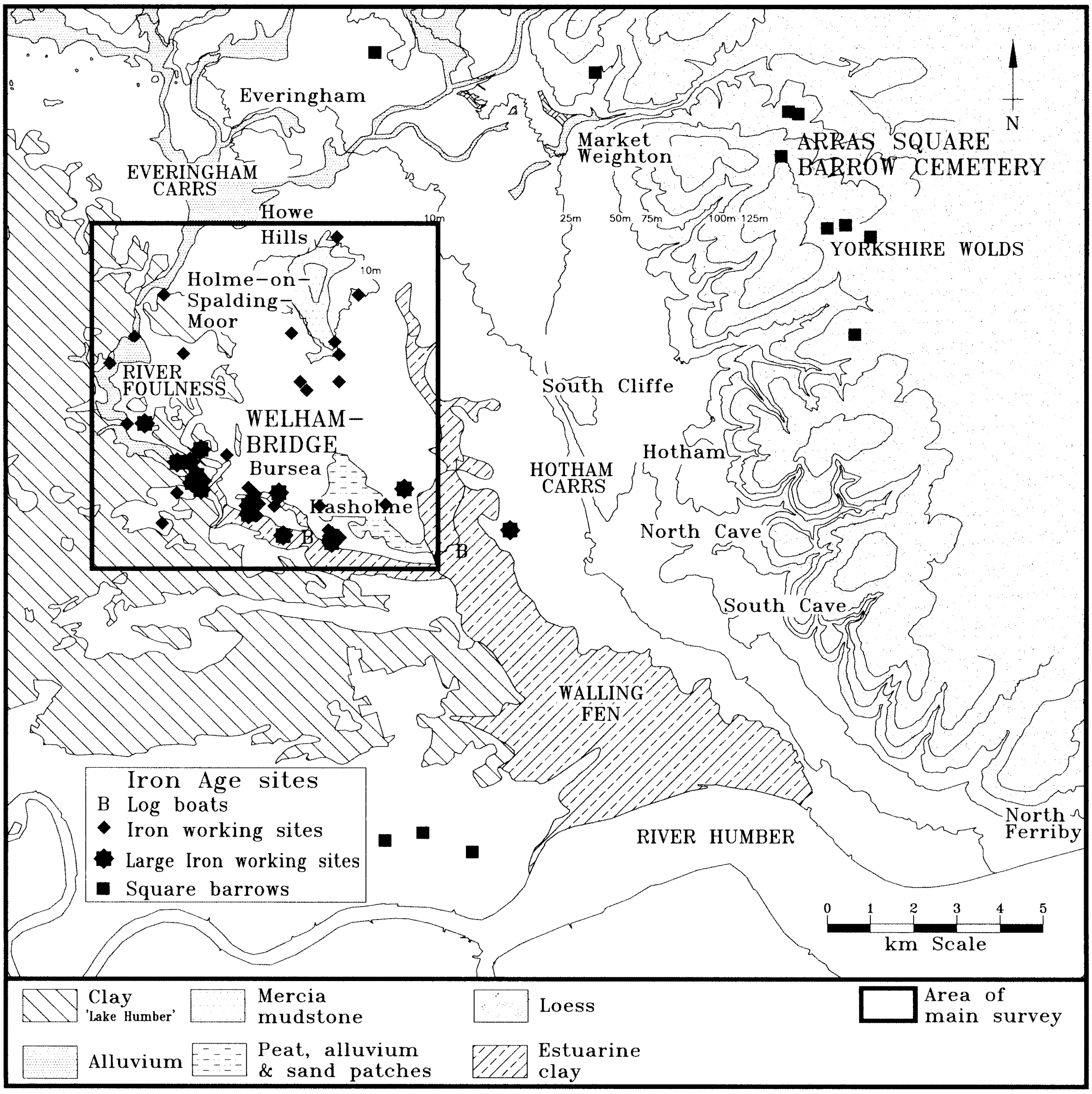

Figure 14 Distribution of Iron Age sites, against a generalized map of sediment types (based on King and Bradley 1987). Note presence of estuarine deposits in the area of Walling Fen

remained high, with continued growth of peat, freshwater reed swamp and fen-carr wetland along the upper part of the Foulness valley. The beetle evidence (see Heath and Wagner, Section 2.4) may also indicate climate deterioration at this time.

1.5 The Iron Age (Fig. 14; Pl. 8)

Around 800-500BC, there was a dramatic environmental change which was to be of major importance to the future development of the whole of the Southern Vale of York, when a marine transgression led to the development of a tidal inlet, extending northwards from the present bank of the River Humber, almost as far as Market Weighton (Halkon 1987 and 1990; Halkon and Millett 1999; Millett and McGrail 1987). This marine incursion, which penetrated upstream at least as far as East Bursea Farm (SE 8070 3312), turned the tributary stream valleys into tidal creeks. Analysis of unpublished Soil Survey maps, the results of the borehole survey (Section 2.3) and the watching brief on the digging of the irrigation lake at Hasholme Grange, showed that over a metre of estuarine clay was deposited on the peat (Pl. 8). The contractors involved in digging the lake had noticed that most of the large trees in the upper layers of the peat lay in the same direction, presumably as a result of the marine transgression. A forested freshwater landscape was, therefore, transformed, and the River Foulness system became integrated within the water system of the Humber estuary, allowing greater communication and trade with the outside world, and increased access to and from the eastern Vale of York and the southern Yorkshire Wolds. The sand ridges to the south of Hasholme, bordering the present course of the River Foulness, in effect became the northern shore of the River Humber.

The Iron Age archaeology is described in detail elsewhere (Halkon and Millett 1999; Halkon 2008), but environmental change continued to influence human activity in the Foulness valley. The most striking evidence for the use of this tidal inlet and its associated creek system for transport is the Iron Age log boat, discovered at Hasholme Hall in 1984 (Millett and McGrail, 1987). A

Plate 8 Section across the irrigation pond at Hasholme Grange, during sampling for pollen analysis. Note the thick layer of estuarine clay above the peat. The lower Neolithic estuarine clay is just visible at the bottom of the photograph

further log boat was discovered and destroyed near South Carr Farm, Newport, during land drainage (SE 849 329; Halkon 1997a). The South Carr Farm boat was reported by the finders as being larger than the 12m long vessel from Hasholme, and as impressive, tapering towards a prow, which although it rose up at a similar angle to that of the Hasholme boat, was integral to the rest of the structure of the boat. Such typological similarities between the two vessels, and its stratigraphic context in grey/blue estuarine clay, very similar to that which preserved the Hasholme Boat, suggest that it too was of Iron Age date.

During fieldwork iron-smelting sites were discovered which clustered around the creek system margins in which the Hasholme and South Carr Farm boats sank (Fig. 14). Pieces of slag from a heap excavated in 1985 at Moore's Farm, Welhambridge, near Holme-on-Spalding Moor, have been dated to 450-250 cal BC (2 sigma) (HAR-9234) and 600-380 cal BC (2 sigma) (HAR 9235) (For analysis and discussion, see Halkon and Millett 1999, 80-1. For earlier notices of this material. see also Millett and Halkon 1986; Halkon 1995; Halkon 1997b). P. Clogg of the Department of Archaeology, University of Durham, has carried out detailed characterisation of the slag, which provides some insight into the type of technology of one of the largest and earliest iron smelting sites in Britain. The location of such sites points to a strong correlation between these and the estuarine inlet and its creek systems. Iron smelting also took place in the Iron Age at North Cave, where a settlement, consisting of a series of round-houses within enclosures was excavated (Dent 1989, 30) *c.* 2km to the east of the South Carr Farm vessel.

Aerial photography by various individuals, including J. Pickering, D. Riley (1974) R. Mackey and the writer, has revealed very dense crop-marks of enclosures, huts, droveways and fields, many of which, can be dated typologically to the later Iron Age, on both sides of the former inlet, extending from the Humber foreshore to Market Weighton. Such features suggest large-scale expansion of agriculture, though a substantial amount of woodland must have remained to provide fuel for the iron industry. The beetle evidence (see Heath and Wagner Section 2.4 below) may also support such a reduction of woodland.

Elsewhere in the region, the palaeobotanical evidence, reviewed by Dinnin (1997), also suggests a time of high-intensity regional deforestation for mixed agriculture, with cereal cultivation an important component. A significant result of this increase in farming activity was the asynchronous decline of *Tilia* (lime) pollen frequencies, as much of the mature woodland was cleared from the better soils (Turner 1962), and a relatively open landscape developed. A number of clearance phases during the mid and late Iron Age to the south of the Humber at Crosby Warren (Holland 1975) resulted in podzolisation of the sandy soils, their erosion and an increase in heathland. Bush and Ellis (1987) suggested that woodland clearance and ploughing around the Willow Garth site (cut by the Gypsey Race near Rudston) on the Wolds, caused soil erosion in the late Iron Age, at the same time as the most destructive phase of clearance at Thorne Moors and Hatfield Moors in the Humberhead Levels (Smith 1985) and at Roos Bog in Holderness (Beckett 1981). The effects of this widespread regional deforestation, arable farming and soil erosion in the late Iron Age and Roman periods, were to increase dramatically alluvial sedimentation in the valleys and lowlands of the Humber (Buckland and Sadler 1985; Dinnin 1997). The dense Iron Age agricultural and industrial landscape in the catchment of the Foulness valley is strong evidence that some parts of this area may also have undergone deforestation and alluviation at this time. The beetle assemblages from Hasholme Grange and Skelfrey Beck (see Section 2.4) point to large herbivores being present. Although cattle can be grazed in woodland, the insect evidence does suggest the presence of permanent pasture, perhaps analogous to traditional meadows used until recent times. The droveways and enclosures appearing as crop-marks in aerial photography, almost certainly associated with the rearing and management of cattle, have already been referred to. The Hasholme boat sank carrying beef (Millett and McGrail 1987), and further cattle bones were found during the excavation of the Hasholme Grange irrigation pond in 1996; the proximity of the latter to the Hasholme boat find-spot suggests that they may have been part of the same cargo.

Given the probability that the Hasholme Boat and the iron industry were contemporary, an economic relationship between these and the Arras Culture may be considered. In the distinctive funerary practices of these people, especially the cart or chariot burials, iron objects held a special place, exemplified by the iron mirrors, mail shirts, weapons, tyres and other cart or chariot fittings deposited as grave goods (Stead 1991). The experimental work on the iron industry of the Iron Age by Peter Crew (1991) also demonstrates that this was a more valuable commodity than has been appreciated. It is worth pointing out that from the Arras square barrow cemetery itself (Stead 1979), there is a clear view directly down Sancton Dale, to the head of the tidal creek system, and indeed this dry valley must have provided the natural route from the head of the inlet up to the Wolds (Fig. 14).

Conclusion to Section 1

Exploration of the Foulness valley has shown the great potential for combining environmental and archaeological evidence, and the great variety of topography and soil types in a relatively small area makes it particularly attractive for landscape study; within this, strands of change and continuity can be detected.

New discoveries combined with earlier research have shown that the 19th century Bielsbeck Pleistocene mammal finds were by no means unique in the area, and may have been related to a buried interglacial valley – a "proto-Foulness" – and the Hotham hand-axe hints at the possibility that rare evidence for human activity at this time may lie as yet undiscovered.. After the Devensian Ice Age, fieldwork has revealed new evidence for Mesolithic human-landscape interaction in the Foulness Valley, as the sand ridges bordering its lakes and related watercourses were attractive to hunter-gatherer communities, in a similar way to the more famous sites of Star Carr and Seamer Carr in the Vale of Pickering (Schadla-Hall 1987; Conneller and Schadla-Hall 2003). This Foulness valley investigation, though as yet small in scale, shows that it may be possible to relate floral and faunal evidence with human activity, and there is great potential for further study. Artefactual evidence suggests similar processes of exploitation of the environment as elsewhere in the region, which may be studied within a background of sea-level change. It is likely that Mesolithic deposits are preserved under later alluvium.

The HLB remained wooded in the Neolithic, and may have been a deliberately maintained woodland zone supplying timber and forest products for the communities settled on the cleared land to the north and east. The distribution of bronze axe hoards and individual axe losses may also represent continuity of woodland management, which was to be subsequently crucial for the development of the HLB's nationally important early iron industry. The combination of artefactual and environmental evidence, therefore, provides great potential for looking at the tools, not merely from the viewpoint of typology or trade, but as agents of change within the landscape.

Again, there appear to have been ritual and communication links between Wold upland and the lowland areas, especially on the dry valleys on the western Wold edges. Neolithic, Bronze Age and Iron Age burials also cluster on the Wolds escarpment near Market Weighton, as do deposits of Bronze Age tools. The siting of round barrows at the head of the dry valleys may demonstrate a spatial and ritual link between the chalk high land and the plain below.

Sea-level and related environmental changes have been shown to be cyclical in nature, with evidence of marine transgression in the later Mesolithic and Iron Age. The landscape block may also hold a key for understanding the economic basis of the regional Arras Culture. The area is of national importance, as two log-boats and one of the largest iron production centres in Britain have been found here.

The life of this rich archaeological and palaeo-environmental resource is not, however, infinite. The area is farmed intensively, and over the last two decades a combination of dry summers and drainage has resulted in the desiccation of peat and alluvial deposits. It is therefore imperative that the exploration of this complex ancient landscape continues and its importance recognised more fully.

Section 2. The palaeo-environmental evidence

2.1 Mammalian remains from North Cliffe, Mott's Field (South Cliffe) and Bielsbeck Farm, East Yorkshire
by Danielle C. Schreve and David R. Bridgland

Mammalian remains from the North Cliffe site (SE 808 368) comprise the following three taxa:

Perissodactyla
Equus ferus Boddaert, horse

Artiodactyla
Cervus elaphus L. red deer
Bovidae sp., indet. large bovid (*Bos* or *Bison*)

Mammalian fossils from Mott's Field, South Cliffe (SE 8640 3591) comprise the following five taxa:

Proboscidea
Palaeoloxodon antiquus (Falconer and Cautley), straight-tusked elephant
cf. *Mammuthus*, mammoth

Perissodactyla
Equus ferus Boddaert, horse

Artiodactyla
Cervus elaphus L., red deer
Bovidae sp., indet. large bovid (*Bos* or *Bison*)

The remains are generally in a relatively poor condition, being extremely fragmentary. However, the following elements were identifiable (all material is now housed in Hull Museum, lower dentition indicated by lower case letters, upper dentition by capitals):

1. left first lower molar (m1) of *P. antiquus*
2. molar fragments of cf. *Mammuthus*
3. vertebral centrum, first metapodial, 2 distal metapodial

epiphysial fragments and the distal tip of a neural spine of an indeterminate elephant

4. left mandible with incisors 1-3, canine, p2 and p4-m3 *in situ*, right incisor 1, right M2, 3 cervical vertebrae and an incomplete right humerus of *E. ferus*, probably all from the same individual
5. upper cheek tooth fragment of *E. ferus*
6. incomplete right tibia and a proximal epiphysis of a first phalanx of *C. elaphus*
7. right first lower molar (m1) of an indeterminate large bovid (*Bos* or *Bison*)

Palaeo-environmental and palaeoclimatic interpretation

Although the assemblage is relatively small, some deductions can nevertheless be made about the environment at the time of deposition. The availability of large areas of open grassland is suggested by the presence of large grazing or part-grazing herbivores, such as horse and large bovids, whereas woodland habitats are indicated by *P. antiquus*. The presence of this latter species may be considered an indication of prevailing temperate condition, since *P. antiquus* is known only in association with woodland interglacial episodes in the British Middle and Upper Pleistocene (Stuart 1982). The remaining taxa are known from both cold and warm periods alike.

Biostratigraphy of the North Cliffe and South Cliffe sites

The assemblage from North Cliffe contains no taxa of particular biostratigraphical significance. Horse, red deer and large bovids are known from both cold and temperate stage deposits. However, some broad generalisations concerning the age of the Mott's Field assemblage may be made on the basis of the combination of *P. antiquus*, cf. *Mammuthus* and *E. ferus*. The occurrence of *P. antiquus* implies fully interglacial conditions, but the presence of horse provides good evidence that these deposits are not of Last (Ipswichian = Marine Oxygen Isotope Stage [MIS] 5e) Interglacial age, since this species is unknown from any Ipswichian site in Britain (Currant 1989; Sutcliffe 1995; Currant and Jacobi 2001). The presence of a second species of elephant, tentatively identified as mammoth, may also be of biostratigraphic significance, since mammoth is absent from the Hoxnian (MIS 11), MIS 9 and MIS 5e Interglacials (Shreve 2001a). The Mott's Field fauna bears a striking resemblance to that from nearby Bielsbeck Farm (SE 861 378), where an assemblage also dominated by *P. antiquus* and *E. ferus*, in association with a late form of steppe mammoth (*Mammuthus trogontherii*) was recovered in the early 1800s. This fauna has been recently assigned to a post-Hoxnian, pre-Ipswichian interglacial that can be correlated with MIS 7 (Sutcliffe 1995; Schreve 2001a). The close proximity of these sites suggests that the same deposits are represented by both. For this reason, a closer look will be taken here at the evidence from the more prolific site at Bielsbeck Farm. A plan of the 1908 excavations at Bielsbeck is shown in Fig. 3 (after Lamplugh *et al.* 1910).

The Bielsbeck Farm site

The first published reference to the Bielsbeck site (SE 861 378) is by Vernon Harcourt (1829), who described the discovery of elephant, rhinoceros, deer, ox, horse and lion remains, in marl deposits beneath gravel. Extraction in the pit began in 1828, when a single bone was recovered, but the remainder of the assemblage was excavated in the summer of 1829. Harcourt recognized that several changes in climate had occurred since deposition of the bones, but had no idea of their great antiquity, believing, that the earth was only 4,000 years old. Investigations into the deposits were later carried out by the British Association Committee (Lamplugh *et al.* 1908; 1910). Further references to the site were provided by Dawkins (1867), Lamplugh (1898), Sheppard (1903), Kendall and Wroot (1924), Stather (1925), Melmore (1935), Boylan (1977), Sutcliffe (1995a), and Schreve (1999). The original marl pit had become flooded by 1908, and the surrounding land is still under agriculture.

Geological background and provenance of mammalian remains

In the south-eastern Vale of York, a bench of Lias extends northwards from the River Humber to Market Weighton, where it follows the south-western foot of the Wolds escarpment. The fossiliferous Pleistocene deposits were described by Vernon Harcourt (1829) and Lamplugh *et al.* (1910) as resting on red Keuper Marl, near the boundary with the Lias, in a hollow in a former land surface. Vernon Harcourt (1829) described the following section in the marl pit from which the bones were recovered (Fig. 3):

5. Black sand, 9 inches (0.23m)
4. Yellow sand, 1 foot 6 inches (0.45m)
3. White gravel consisting of small pebbles of chalk, with angular fragments of flint, with a few pieces of *Gryphaea* incurva, and fewer pebbles of sandstone, 2 feet 6 inches (0.75m)
2. Blue marl, containing bones and irregularly penetrated by the gravel, 5 feet (1.5m)
1. Blacker marl, containing bones, land, marsh and freshwater Mollusca, Coleoptera and plant remains, at least 10 feet (3m)

Mammalian remains, including horns of *Bos primigenius* and jaws of *Panthera leo*, reportedly came from the blacker marl (Bed 1), whereas antlers of *Cervus elaphus*, an elephant femur and rhinoceros remains were recovered from Bed 2. Similar sequences were reported by Lamplugh *et al.* (1908), although with bed thicknesses greater than those recorded by Harcourt.

A detailed species list has been compiled from material housed in the Yorkshire Museum, and collected by Harcourt and the British Association. Ninety-six specimens were examined, and the presence of 11 mammalian species confirmed (Schreve 1997; 1999). Preservation of the bones is generally fresh, suggesting that they were not transported far from where they were originally deposited.

Carnivora

Canis lupus L., wolf
Ursus arctos L., brown bear
Panthera leo (L.), lion

Proboscidea

Palaeoloxodon antiquus (Falconer and Cautley), straight-tusked elephant
Mammuthus cf. *trogontherii*, steppe mammoth (late form; taxonomy revised according to Lister and Sher 2001)
Elephantidae sp., indet. elephant

Perissodactyla
Equus ferus Boddaert, horse
Stephanorhinus hemitoechus (Falconer), narrow-nosed rhinoceros
Rhinocerotidae sp., indet. rhinoceros

Artiodactyla
Cervus elaphus L., red deer
Capreolus capreolus (L.), roe deer
Bos primigenius Bojanus, aurochs
Bison priscus Bojanus, bison
Bovidae sp., indet. large bovid (*Bos* or *Bison*)

Palaeo-environmental and palaeo-climatic interpretation

The mammalian remains from Bielsbeck reflect a similar range of environments to those from Mott's Field. The presence of open grassland is suggested by the presence of horse, narrow-nosed rhinoceros and large bovids, whereas woodland habitats are indicated by *U. arctos*, *P. antiquus* and *C. capreolus*. The mammalian assemblage is fully interglacial in character, as indicated by the presence of *P. antiquus*, *S. hemitoechus*, *C. capreolus* and *B. primigenius*, which are known only from temperate episodes in the Pleistocene. The Mollusca from the black marl (Bed 1) include land, marsh and freshwater species, with *Lymnaea* and *Planorbis* being the most abundant (Vernon Harcourt 1829). Plant remains, including *Ranunculus*, *Viola*, *Rumex*, *Sparganium* and *Carex* were also recorded (Reid, in Lamplugh *et al.* 1908), together with coleopteran remains, including *Donacia* and *Hister* (Lamplugh *et al. ibid*) and bones of an indeterminate duck (Melmore 1935).

Biostratigraphy and correlation

The Bielsbeck mammalian assemblage bears strong resemblance to that from the upper part of the sequence at Aveley (Schreve 2001a and b) and Ilford (Uphall Pit) (Cotton 1847; Davies 1874), both in Essex, the Lower Channel at Marsworth, Buckinghamshire (Murton *et al.* 2001), and Brundon (Moir and Hopwood 1939), all of which have been correlated with the penultimate interglacial, MIS 7 (Schreve 2001a).

A critical factor is the co-occurrence of straight-tusked elephant with mammoth, a combination unknown from any other interglacial in Britain. The smaller assemblage from Mott's Field contains both of these elements, although, rather unusually for a MIS 7 site, where open grassland is the dominant vegetation type, and remains of *Palaeoloxodon* from Bielsbeck outnumber those of *Mammuthus*. It is possible that some of the indeterminate elephant material may be of the latter species, although factors such as local conditions or taphonomy may be accountable for the predominance of the former. The Bielsbeck mammoth is tentatively attributed to a late form of *M. trogontherii* according to taxonomic revision of the late Middle Pleistocene mammoths by Lister and Sher (2001). The significance of this late form is that it has a combination of small size and low plate count in the molars, giving it a relatively less derived (i.e. more 'primitive') aspect than the last cold stage woolly mammoths. Late form *M. trogontherii* has been noted as a characteristic component of mid-late MIS 7 sites in Britain (Schreve 2001a) and elsewhere in NW Europe (Schreve and Bridgland 2002).

Other significant elements of the Bielsbeck assemblage include horse (11.45% of the assemblage), abundant large bovids (17.69% of the assemblage), of which aurochs is more common than bison (10 specimens compared to 3), and moderately abundant red deer and narrow-nosed rhinoceros (3.12% each of the assemblage). The Bielsbeck Carnivora are represented by a large-bodied form of lion, in association with wolf and brown bear. The combined presence of these species is considered to be most consistent with the Sandy Lane Mammal Assemblage-Zone of Schreve (2001a), correlated with the mid-late part of the MIS 7 interglacial, possibly MIS 7a, *c.* 200,000 years ago (Schreve 2001a and b).

Mammalian identifications from Bielsbeck Farm

(Abbreviations: L. = left, R. = right, prox. = proximal, dist. = distal, mand. = mandibular, max. = maxillary, frag. = fragment, indet. = indeterminate, lower dentition is indicated by lower case letters, upper dentition by capitals)

All material is housed in the Yorkshire Museum; box numbers are given where no registered specimen numbers are present.

CARNIVORA

Canidae

Canis lupus L., wolf
Box 3686 imperfect R. mand. ramus with R p1-m1(damaged) *in situ*, Box 3686 dist. R humerus, Box 3686 R radius, Box 3686 dist. R radius, Box 3686 R ulna

Ursidae

Ursus cf. *arctos* L., brown bear
Box 3686 prox. L radius, Box 3686 L tibia, Box 3686 juvenile dist. R tibia

Felidae

Panthera leo (Goldfuss), lion
699 lower jaw with L canine and L p4-m1 and R canine and R p3-m1 *in situ*, Box 3686 R max. frag. with R P3-P4 *in situ*, Box 3686 prox. L ulna, Box 3686 associated L 2nd and 3rd metacarpals, Box 3686 L femur, lacks dist., Box 3686 dist. R tibia

PROBOSCIDEA

Elephantidae
Palaeoloxodon antiquus (Falconer and Cautley), straight-tusked elephant
Box 3682 1980-375f part of tusk (cf. *P. antiquus*), Box 3676 2 L m1s, Box 3868 YORYM.G698 R m1/m2 (*figured in Boylan 1977, 21, Figs. 10a, b*), Box 3676 post. part of R m2, Box 3676 R max. frag. with R DP4 *in situ*, Box 3676 unworn L DP4,, Box 3676 molar frag., Box 3681 possibly associated juvenile atlas and axis vertebrae (cf. *P. antiquus*), Box 3677 prox. R scapula (cf. *P. antiquus*), Box 3680 juvenile R humerus prox. epiphysis (cf. *P. antiquus*), Box 3678 epiphysis of dist. L femur (cf. *P. antiquus*)

Mammuthus cf. *trogontherii* (Pohlig), steppe mammoth (late form)
Box 3676 L M1 or M2, , L and R M1 (pair), Box 3769 dist. L tibia (cf. *Mammuthusus*)

Elephantidae sp., indet. elephant
Box 3682 2 tusk tips, Box 3679 1980/373f mand. symphysis, Box 3679 juvenile lumbar vertebra, Box 3684 3 associated juvenile caudal vertebrae, Box 3678 R lunar, Box 3677 prox. L 3rd metacarpal, Box 3678 1st phalanx, Box 3678 imperfect lateral 1st phalanx of juvenile, Box 3677 pelvis frag., Box 3678 2 parts of pelvis, Box 3680 prox. epiphysis of juvenile femur, Box 3684

1980 376f juvenile femoral midshaft, Box 3680 2 juvenile femoral midshaft frags., Box 3680 dist. epiphysis of femur frag., Box 3684 patella, Box 3682 juvenile midshaft of L tibia, Box 3677 dist. R tibia, Box 3678 L astragalus, Box 3680 indet. long bone frag.

PERISSODACTYLA
Equidae
Equus ferus Boddaert, horse
Box 3685 lumbar vertebra, Box 3685 imperfect L scapula, Box 3685 imperfect R scapula (pathological), Box 3685 complete L radius and fused dist. ulna shaft, Box 3685 juvenile prox. L radius and ulna shaft, Box 3685 dist. R radius, Box 3685 1st phalanx, Box 3685 2nd phalanx, Box 3685 3rd phalanx, Box 3685 dist. R femur, Box 3685 L 3rd metatarsal

Rhinocerotidae
Stephanorhinus hemitoechus (Falconer), narrow-nosed rhinoceros
Box 3683 1980/372f L M2, Box 3683 dist. L humerus, Box 3683 prox. L radius

Rhinocerotidae sp., indet. rhinoceros
Box 3684 cervical vertebra, Box 3683 juvenile R humerus midshaft (gnawed), Box 3683 L and R acetabula, Box 3683 juvenile R tibia midshaft

ARTIODACTYLA
Cervidae
Cervus elaphus L., red deer
Box 3685 2 antler frags., Box 3685 L metacarpal

Capreolus capreolus (L.), roe deer
Box 3685 1980/377f dist. R tibia

Bovidae
Bos primigenius Bojanus, aurochs
Box 3684 L M2, Box 3684 L M3, Box 3684 L radius, Box 3684 prox. L ulna (cf. *Bos*), Box 3684 dist. R metacarpal (cf. *Bos*), Box 3684 1st phalanx (cf. *Bos*), Box 3681a R tibia, Box 3684 R calcaneum, Box 3684 imperfect R calcaneum, Box 3684 L metatarsal

Bison priscus Bojanus, bison
Box 3684 R astragalus (cf. *Bison*), Box 3684 damaged L metatarsal

Bovidae sp., indet. large bovid (*Bos* or *Bison*)
Box 3684 lumbar vertebra, Box 3684 neural spine of vertebra, Box 3684 dist. R femur, Box 3684 juvenile R metatarsal midshaft

2.2 The animal remains from Market Weighton Beck
by A. King

Two well-preserved bones, both of red deer (*Cervus elaphus*) were found at the same level as a naturally felled oak (Section 1.2 above). One was a left mandible, fairly complete, but with no teeth surviving. P1 had been lost sometime before death, and the alveolus had healed over. The other cheek teeth were probably lost after death, perhaps because there was slight recession of the alveoli, which would have made the teeth loose in their sockets. Although the lack of teeth makes estimation of age difficult, the animal was clearly adult, and one suspects relatively elderly. The other bone was a left femur, with some *post-mortem* damage to the proximal and distal extremities. There was also an area of eburnation on the proximal head of the femur, on its posterior surface in the zone where it would have made contact with the rim of the acetabulum. This too suggests a relatively old animal, and there is some reason to suspect that both the bones may have come from the same individual. The presence of deer and dog in such a context need be of no surprise, such species are perfectly familiar from the work at Star Carr and Seamer Carr in the Vale of Pickering. Both finds were unarticulated and were probably re-deposited from further upstream.
Measurements (in mm. Using von den Driesch's (1976) system) * approximate
Mandible (2) 339* (4) 205* (7) 116 (8) 81 (9) 37 (11) 81* (12) 144* (13) 131 (14) 184 (15a) 41 (15c) 39
Femur GLC 290 DC 40 SD 29

2.3 Stratigraphic and pollen analyses in the lower Foulness valley
by Jim Innes, Anthony Long and Ian Shennan

Introduction
The stratigraphic succession and environmental history in the lower part of the River Foulness valley has been investigated as part of a wider study of the sea-level history and palaeogeography of Humberside. The area was chosen for detailed study, because the estuarine origin of the grey silty clays, lying near to the surface, along the river valley and its tributary creeks, has been proven by diatom analyses (Jordan 1987) during earlier research into the environmental context of the Hasholme Iron Age logboat (Millett and McGrail 1987). The environmental analyses undertaken as part of the Hasholme excavation were directed, however, towards elucidating the age and environment of deposition of the upper sediments with which the boat itself was associated, in order to help date the archaeological remains and relate them to their palaeo-environmental context. Pollen analyses (Turner 1987) were made on the peat layer underlying the upper clay which contained the boat, while the base of this peat was radiocarbon dated to 4789 – 4348 cal BC (2 Sigma) (HAR-7007) and the top of the peat to 815 – 405 cal BC (2 Sigma) (HAR-7005). No data were presented regarding the environment of deposition of a further silty clay unit beneath this peat. This lower clastic deposit was not bottomed, and the succession beneath it is unknown.

The current research has investigated the full sediment sequence within the lower part of the Foulness valley itself, near to its junction with Walling Fen, to clarify the age and origin of the deeper sediments, and to show how representative the sediments at Hasholme are of the Foulness system as a whole, and thus how reliable is their environmental context for the reconstruction of the area's palaeogeography and coastal history. This information will also be of great value for placing the rich archaeological resource of the area in its landscape context.

Stratigraphy (Fig. 15)
The locations of representative cores in this survey are shown in Fig. 15 (upper), and their stratigraphic records are shown in generalised form in Fig. 15 (lower). A transect of borings was completed along the valley of the River Foulness between Welham Bridge (SE 7923 3429) at core 1, and Sandhill Farm (SE 841 832), which occupies a sand

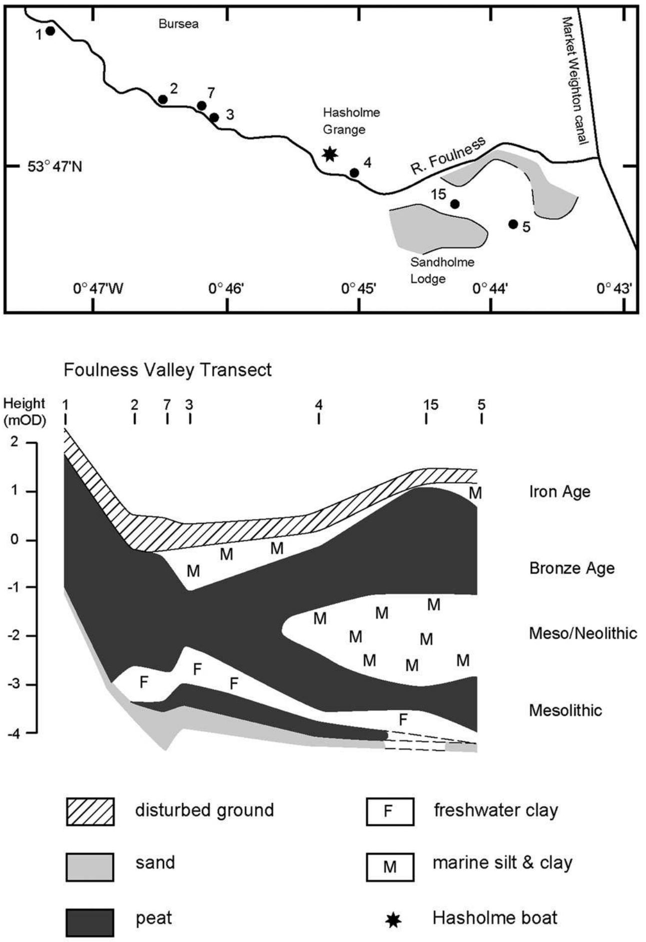

Figure 15 Location map of Foulness valley bore holes (upper); transect sections across the Foulness valley (lower)

island near the junction of the Foulness with the Market Weighton Canal. The location of the small palaeo-creek which contains the Hasholme boat archaeological site is about midway along this transect's length, lying to the north of the river near core 4, Hasholme Grange. A second transect of cores was also completed across the valley to ascertain the lateral extent of the main stratigraphic units, crossing the long transect at core 5, at Sandholme Lodge. The main stratigraphic elements of the Hasholme boat excavation were confirmed as present in the main river valley downstream of core 7, near Bursea Farm. A thick peat layer occupied most of the sequence, with thinner clay layers both below it and above, at the surface. The surface clay layer was of variable thickness, and had clearly been affected by recent river canalising activity, as well as by drainage and sediment shrinkage and wastage. The lower clay was penetrated in all cores, and basal peats were recorded, of varying thickness, which lay upon the basal coarse sand. The lower clay unit was not present at the upstream end of the transect at Welham Bridge, where the surface of the basal sand lay at a higher altitude, and peat lay directly upon the sand. This was also the case at Sandhill Farm, northeast of core 5, where very shallow peats rest on sand and show the presence of sand ridges, which delimit the winding course of the old river channel. The modern River Foulness is canalised, and passes to the north of this sand ridge feature.

Two intercalated clays and peats are recognised in the long transect in cores 3 and 7 in the area of Bursea, upstream of Hasholme. In the downstream, eastern part of the transect, however, between Hasholme and Sandholme Lodge, a further clay layer occurs which divides the main, upper, peat unit into two distinct peats. This middle clay is only a few tens of centimetres thick immediately upstream of core 4, but increases markedly in thickness downstream, reaching over one and a half metres at Sandholme Lodge, core 5, where further cores have shown it to be present across the whole of the valley at that point.

In summary, the most representative sequence occurs at Sandholme Lodge where the following seven stratigraphic units occur: (1) basal coarse sand, (2) thin peat, (3) thin silty clay, (4) detrital peat and mud, (5) silty clay, (6) humified reed-swamp and fen peat, (7) surface silty clay. Unit (5) is the middle clay, not present in the upstream part of the long valley transect. As three peat/clay couplets existed at Sandholme Lodge, that site was chosen for pollen and diatom analyses of the sediments. It should be noted, however, that some considerable lateral variability exists in these major stratigraphic units. The clastic layers show wide variations in their organic fraction and in the amount of contained macrofossil remains. Differences in contact altitudes occur, perhaps caused by erosion under estuarine processes, most extremely by channel features, which have presumably removed the upper peat in core 25. In places, the basal sediments could not be reached through the deep lower clastic sequence.

Pollen and diatom analysis (Fig. 16)

The thin basal peats (unit 2) at Sandholme Lodge were analyzed for pollen, but preservation was very poor, and the results are not presented here. They would appear, however, to be of early Flandrian (Holocene) age, because of their very restricted range of tree species, and are dominated by grass and sedge pollen. The lower two silty clay units, 3 and 5, were examined for diatoms. Very few were preserved, but were sufficient to show that unit 3 (mainly *Pinnularia* spp.) was of freshwater origin, while unit 5 (e.g. *Nitzschia navicularis* and *Diploneis didyma*) was of estuarine origin. Pollen data from two closely adjacent cores, Sandholme Lodge 5 and 24, are combined on Fig. 16, and these confirm the conclusions of the diatom evidence. The peat at the base of unit 4, which rests on the silty clay of unit 3, shows no indications of saltmarsh or coastal conditions. These deposits formed above the limit of estuarine sedimentation. Near the boundary between units 4 and 5, the peat/clay transition, several pollen taxa indicative of saltmarsh and general coastal environments were recorded. These include Chenopodiaceae, *Artemisia*, and *Taraxacum*-type. These same coastal herbs occurred again at the clay/peat transition between units 5 and 6. Their presence proves the proximity of saltmarsh environments, and confirms the estuarine origin of the silty clay of unit 5.

The detrital peat, unit 4, is dominated by *Alnus* (alder) pollen with lesser amounts of *Quercus* (oak) and *Corylus* (hazel). The low pollen producer *Tilia* (lime) is moderately high, matching *Ulmus* (elm) frequencies and even surpassing them near the top of this peat bed. This mixed deciduous forest assemblage suggests a date during the latter part of the mid-Holocene chronozone Flandrian II, which has been dated in the Humber region (Tweddle 2001) and throughout lowland northern England (Innes 2002) to between *c.* 7000BP and *c.* 5000BP (e.g. Hibbert *et al.* 1971). The low elm pollen percentages near the top of this peat

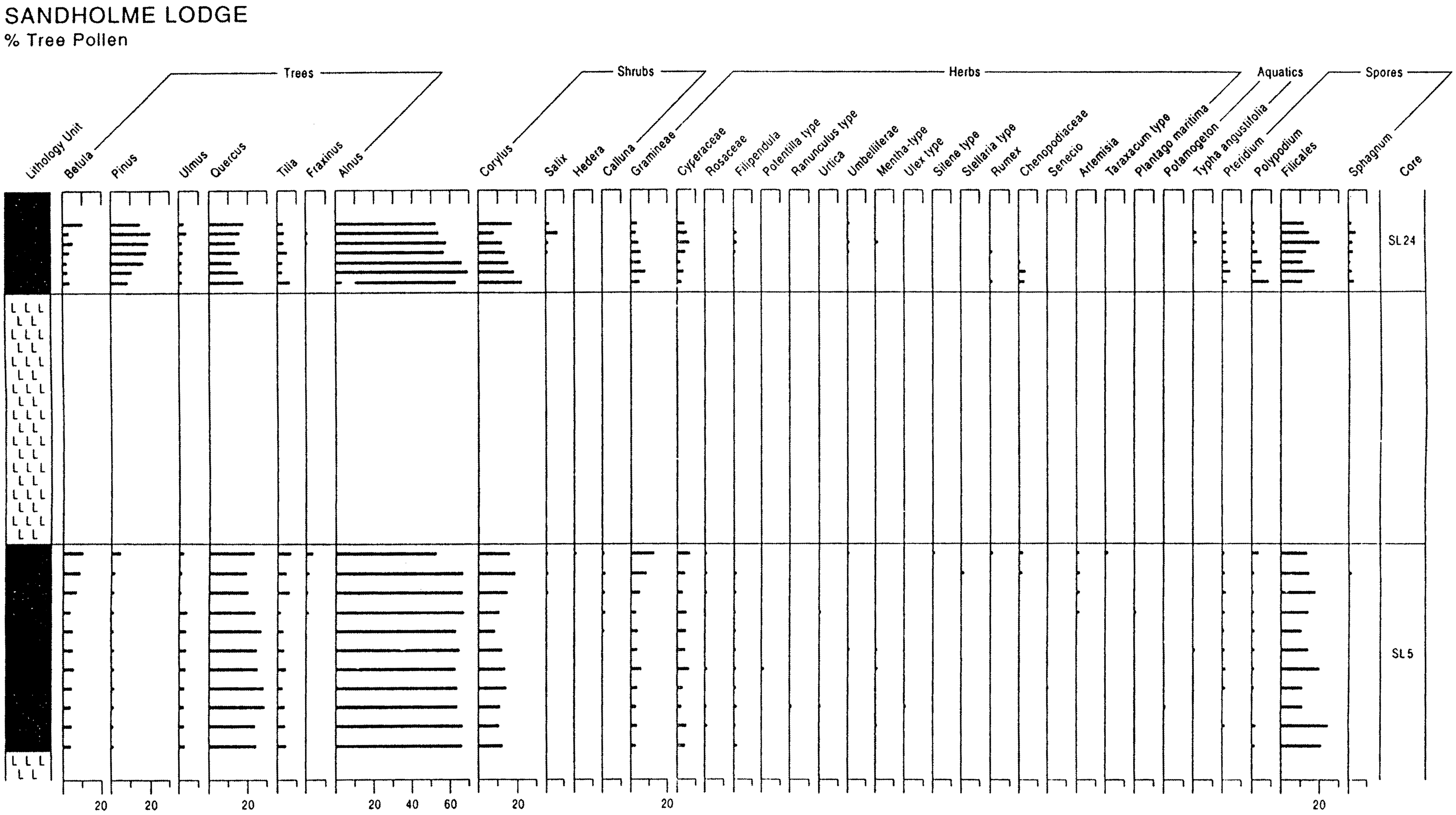

Figure 16 Sandholme Lodge pollen diagram

resemble the regional decline in elm pollen, which is used to define the end of this forest phase, e.g. 4030 – 3783 cal BC (2 Sigma) at nearby Gransmoor Quarry in Holderness (Beckett 1981). It seems certain, however, that the low elm values result in part from the statistical suppression of elm pollen percentages by superabundant local alder carr pollen production in the very wet soil conditions of the Foulness valley, but elm populations in the valley may well have been very low. The radiocarbon date of 4535 – 4352 cal BC (2 Sigma) (SRR-4894) for the top of this peat (unit 4), at Sandholme Lodge core 5, shows it still to be of late Flandrian II age, and pre- elm decline. It represents a period of positive tendency in sea-level movement. This date for the replacement of peat-forming freshwater environments by the estuarine silty clays of unit 5 is very near to the date of 4789 – 4348 cal BC (2 Sigma), from the Hasholme boat site for the base of the peat overlying the lower silty clay (Millett and McGrail 1987). The surface of this lower clay was cracked and infiltrated by peat, and Turner (1987) described it as showing "evidence of having dried out after deposition . . . when local water tables were low and the clay dry enough to support vegetation which decayed *in situ* rather than forming peat". It is not a 'regression' contact, therefore, but records later peat formation, probably under rising water tables caused by the introduction into this part of the Foulness valley of the estuarine influence which is represented at the same date by the silty clay at Sandholme Lodge. This stratigraphic contact at the Hasholme boat site, therefore, probably reflects a positive sea-level tendency, in the way noted by Haggart (1995) for apparently 'regressive' contacts at Tilbury in the Thames estuary.

The pollen record of unit 6 at Sandholme Lodge, the humified reed-swamp and fen peat, is similar to that of unit 4, except for high *Pinus* frequencies which may be due to local pine growth on the sand ridges near this site. The upper part of the peat of unit 6 reflects freshwater environments only, the coastal taxa having faded from the record. The base of the peat of unit 6, marking the withdrawal of estuarine influence from this part of the valley, has been radiocarbon dated to 2886-2585 cal BC (2 Sigma) (SRR-4743) at Sandholme Lodge core 24. After that time, peat formation continued in both the main Foulness and the Hasholme creek valleys, until a major reintroduction of estuarine conditions occurred, which laid down the surface clays, and which is dated to *c.* 815 – 405 cal BC (2 Sigma) at the Hasholme boat excavation site.

Discussion

The results from the stratigraphic, pollen and diatom analyses in the Foulness valley have enabled the reconstruction of its environmental history, and have implications for the study of the archaeological record in the area. The basal peats suggest the existence of reed-swamp environments of high food resource potential in the earlier Mesolithic in most of the valley between Bursea and Sandhill Farm. Quite quickly, however, and certainly through the later Mesolithic, the valley was occupied by a system of freshwater lakes which extended out of the main valley into the tributary stream valleys also. Whether this lake system was continuous or not, the bodies of freshwater, with their inevitable fringing reed-swamps and other wetland, must have provided a focus of resources which would have influenced settlement patterns, perhaps in a way analogous to that of the Vale of Pickering to the north (Cloutman 1988a and b; Schadla-Hall 1989) and in Holderness to the east (Gilbertson 1984b). During the later Mesolithic the lake clays were replaced by detrital peat formation, as water bodies became infilled with organic material. This terrestrialisation was interrupted around 5600BP by a relative rise in sea level, and the introduction of estuarine conditions to the lower Foulness valley for over a thousand radiocarbon years. Estuarine environments did not extend far upstream of the river valley beyond Hasholme Grange. Whether this estuarine expansion reflects progressively rising sea level, or the breaking through of the tide past sand ridge barriers near the present entrance to Walling Fen, can not be known as yet, although the former seems more likely in the context of the sea-level history of the Humber as a whole (Gaunt and Tooley 1974; Long *et al.* 1998; Kirby 2001). The lower Foulness valley had become an estuarine inlet during this stage, and its range of coastal resources would presumably have been attractive to late Mesolithic and Neolithic people. By *c.* 2880 – 2667 cal BC, withdrawal of estuarine conditions occurred and peat accumulation recommenced. This continued throughout Bronze Age times, and these freshwater reed-swamp/fen wetland environments, which had been in existence all along in the upper part of the valley, would still have been attractive to human exploitation. Settlement may well have been restricted to the drier areas away from the valleys themselves. There is hardly any evidence of forest disturbance in the pollen record from Sandholme Lodge, the wide range of herb taxa representing coastal and wetland environments, rather than any agricultural associations. In this respect the Foulness valley data are similar to the evidence from the other river valleys of the Humber region (Tweddle 2001). Woodland cover seems to have remained extensive at this time, at least in the valley itself and on the fringing higher ground. Perhaps exploitation of these environments, even in the late Neolithic and early Bronze Age, was restricted to harvesting of wild game and plant resources, and low-scale woodland management. The vegetation barrier formed by dense valley carr woodland is very effective at screening out all but locally produced pollen, however, and it may well be that even quite major vegetation changes caused by human activity would not be recognisable in the pollen record at these valley sites, unless it occurred very close by. Pollen from more regional sources could easily go unrecorded.

The final, and perhaps most influential, event recorded in the stratigraphy is the major marine incursion of Iron Age times, which penetrated upstream at least as far as core 7, East Bursea Farm (SE 8070 3312), probably beyond core 1 at Welham Bridge, and far up the tributary stream valleys, turning them into tidal creeks. The Hasholme logboat was deposited within the silty clay of one such creek, and its environmental and archaeological contexts have been discussed by Millett and McGrail (1987). During this most extensive period of marine penetration the Foulness valley became integrated within the wider system of the Humber estuary, allowing increased trade and communication with the outside world, and increased access for the eastern Vale of York and southern Yorkshire Wolds to the resources of the Humber estuary itself. Although this marine incursion is not dated in the Sandholme Lodge area, the date from Hasholme of 815 – 405 cal BC (2 Sigma) will approximate the transition from the upper peat at Sandholme Lodge to the desiccated surface clay of unit 7. It conforms with dates of 1401 – 855 cal BC (2 Sigma) and 1420 – 1007 cal BC (2 Sigma), reported by Crowther (1987) from wooden rails recovered during excavation of the Humber foreshore estuarine clay at Melton, to the east of the mouth of the Walling Fen embayment into which the Foulness flowed. It is also supported by radiocarbon data for extensive estuarine conditions in the early Iron Age throughout the Humber system (Fletcher 1981; Smith *et al.* 1981; Dinnin and Lillie 1995; Long *et al.* 1998).

Conclusion

The Foulness valley has been subject to widely contrasting environmental regimes, each of which would have had profound implications for the settlement and economy of the prehistoric inhabitants of the area. The archaeological evidence should be considered in the context of this changing environmental background. It is scarcely surprising, however, that the environmental diversity of this region should have supported the high levels of settlement and activity which are becoming apparent in the archaeological record, even though the direct environmental evidence of this activity is limited. A programme of more detailed ecological work, focused near to the ecotone between wetland and dryland environmental zones, may be required to capture diagnostic evidence of human land-use within this important lowland landscape.

2.4 Coleopteran evidence from the Foulness valley

by AnneMarie Heath and Pat Wagner

A reconstruction of the palaeo-environment of East Yorkshire from insect remains must at present, relate primarily to the later prehistoric periods, because, so far, the only published information on a beetle assemblage recovered from earlier deposits, is from Bielsbeck (Stather 1925), in which the fauna is not described in any detail. Published data for the study area at present, therefore, consist essentially of the beetle reports from the Hasholme Log Boat, and the Ferriby boats excavations (Millett and McGrail 1987; Buckland *et al.* 1990) – both of these assemblages being Bronze Age in date. In addition to these, the coleopteran data used here, come chiefly from three unpublished beetle assemblages. The first, which to avoid confusion will hereafter be referred to as Hasholme B, was recovered from Hasholme, by students of Sheffield University as part of an undergraduate Entomology module. The beetles were obtained from a section excavated in the side of the irrigation pond at Hasholme Grange referred to above, approximately 100m away from the Hasholme Log Boat site where the upper clays, which contained the Log Boat, were exposed, along with the underlying peat. The period of peat formation was dated during the Log Boat excavation to between 4710-4470 cal. BC and 800-540 cal. BC (Millett and McGrail 1987), and the samples, which were collected from the clays and the top 1.5m of peat, are therefore assumed to represent a period covering at least the late Bronze Age/early Iron Age and possibly earlier.

Pat Wagner has provided data from the other two assemblages. One, from a site on the Humber foreshore at Melton, was obtained from the peat beneath a wooden track-way which was excavated in the 1980s (Crowther 1987), and is tentatively dated to the late Neolithic/early Bronze Age, by association with a similar peat exposure at the site of the Ferriby boats, 500m away. The other obtained from Skelfrey Beck near Market Weighton (SE 8640 4225) is assumed on stratigraphic grounds, to be later than 4834 – 4576 cal BC, and is most likely to be late 1st millennium BC in date.

The wetland environment

The faunal assemblages show that the landscape along the course of the River Foulness was not a uniform environment, but was instead, a mosaic of wetland habitats resulting from the various stages of hydroseral succession. The earliest and wettest hydroseral stages are evidenced by aquatic beetles such as the Dytiscidae and the Hydraenidae which inhabit open water and the Hydrophilidae who live in and around smaller detritus pools. Most of the aquatic beetles are associated with slow-moving or stagnant water, although some beetles which prefer faster-moving water, such as the Hydraenid, Limnebius truncatellus (Thun.), are also present. This apparent preference could however mask an association with clean water, a condition which today is increasingly restricted to faster-flowing springs and water sources. Damp marshy ground around the edges of the water is indicated by various *Staphylinidae*, who live among decaying vegetation in fairly wet conditions, and by those *Carabidae* (ground beetle) genera, such as *Pterostichus spp.*, which prefer damp terrain. Fen carr, one of the final stages of a progression to dry land, is suggested by, for example *Chrysomela aena* (L), a *chrysomelid*, which lives in alder carr and sphagnum bogs.

All these habitats appear to have supported a fairly dense vegetation cover, and an idea of the diversity of the vegetation is provided by some of the many beetles, which are associated with particular plants. Floating on the open water were lilies, including both the water and yellow varieties, which are the preferred host plants of the *chrysomelid*, *Donacia crassipes* (F). A range of other *chrysomelids* most notably *Donacia* and *Plateumaris spp.* suggests that the water was fringed with reed swamps containing the plants on which these species live, such as Reed Sweet Grass, Bur Reed, Bulrush and Club Rush (Stainforth 1944). Finally, sedge fen vegetation on the marshland around the water is indicated by certain weevils, including *Limnobaris t album* (L) and *Limnobaris pilistriata* (*Steph*), which feed on *Cyperaeae* and *Carex spp.* respectively. The insect data provide a record of wetland history in the Foulness valley under changing sea level and climatic influences, analogous to the record abtained by Whitehouse (2004) in the area of the Humberhead Levels to the south.

The terrestrial environment

Although dominated, as would be expected by wetland species, all the faunal assemblages contain beetles, which live in drier habitats. Evidence for the amount of woodland, as opposed to open terrain, however, varies from site to site along the Foulness valley, although it is unclear whether this is a result of increased woodland clearance at the later sites, or an indication that clearance in the Bronze Age was of a localised rather than widespread nature. The sites closer to the Humber appear to have been more wooded, with indications of a good tree cover around the middle Bronze Age at Melton and Ferriby. Further upstream, beetles from the Hasholme B assemblage indicate that the tree cover was less extensive, but still fairly plentiful, around that area in the later Bronze Age, with some tentative indications of a decrease in woodland in the early Iron Age. The Skelfrey Beck assemblage, which is furthest away from the Humber, shows trees, but no great extent of woodland. Most assemblages, however, contain sufficient numbers of woodland beetles to suggest that the landscape had substantially more trees in the Bronze Age than in later periods. Species associated with oak appear in all the assemblages, and those associated with alder appear in most. Other host trees indicated at Skelfrey, are birch, willow, and either pear or plum, both of which are home to the *Scolytid, Scolytus rugulosus* (M). At Melton the *Anobiid, Ptilinus pectinicornis* (L) could have been living on oak, elm or elder, and the *Eucnemid, Melasis buprestoides* (L), present in both Hasholme assemblages, could have been found on a range of deciduous trees, but its preference is for beech.

An interesting aspect of the prehistoric woodland is the amount of dead wood present, evidenced by the beetles that attack specific parts of a tree, or those that will infest only dead rather than live wood. Some families such as the *Curculionidae* or weevils attack the leaves and blossom, and consequently are indicators of living trees, for example members of the genus *Rhynchaenus*, present in both Hasholme assemblages. The *Scolytidae* or bark beetles, which are plentiful at all the sites, also attack living trees, carving tunnels under the bark in which their larvae pupate. Other families such as the *Anobidae* and the *Silvanidae*, which move in at a later stage when the tree is dying or dead, are consequently a guide to the amount of dead wood present, and beetles from these families are particularly numerous at most sites. Many of the woodland beetles present in prehistory, particularly those which depend on dead wood, such as *Melasis buprestoides*, from Hasholme and *Platycerus caraboides* (L) from Melton, have now become scarce or even extinct in Britain, due partly to the modern practice of eliminating diseased or dying trees from the forest. The abundance of these beetles in prehistory suggests that if the woodland was managed, it was by smaller-scale practices, rather than the all-embracing strategies used today.

The clearance of almost all of Britain's forests is of course, another reason for the scarcity of many woodland species, a large number of which, having poor dispersal abilities, are now confined to the isolated pockets of land where ancient woodland still exists. There is another possible reason for the disappearance of some of these insects however, which is suggested by the presence of certain of the Melton and Skelfrey Beck beetles. Species such as the lesser stag beetle, *Dorcus parallelipipedus* (L), and the dung beetle *Onthophagus ovatus* (L) are two of a range of beetles from these sites which are distinctly southern, if they are found at all in Britain today. Osborne (1982) postulated that the present restricted distribution of *Onthophagus ovatus* was due not to loss of habitat (which in this instance has probably increased rather than decreased since prehistory), but to climatic fluctuation. These species may therefore, be an indication that summer temperatures in the Bronze Age were perhaps higher than they were immediately after, in the Iron Age. This conclusion is far from certain, however, and whether it will need to be reassessed as more evidence becomes available, remains to be seen.

Dung beetles, which include many members of the *Scarabaeoidae* and the *Hydrophilid* genus *Cercyon*, are present in all the assemblages, and point to the presence of large herbivores. Although cattle can be grazed in woodland, there are indications of open land in most assemblages, and at Skelfrey and Hasholme B, in particular, there are plant-eaters which are indicative of permanent pasture, notably the chafers, members of the *Scarabidae* family and the *Athous* and *Agriotes* genera (click beetles) of the *Elateridae* family. The larvae of these beetles live in the roots of permanent grassland, where they take several years to mature. The garden chafer, *Phyllopertha horticola* (L), found at Skelfrey Beck and both Hasholme sites, always lays its eggs in permanent grassland after making a short dispersal flight. This insect, although less of a problem now, used to be a serious pest in areas with poorer quality unimproved pasture (Walton 1935). Most assemblages, particularly those from Hasholme B and Skelfrey Beck, contain numerous other plant-eaters, and this wide range of beetles indicates that the grassland probably contained an equally rich variety of plants. In terms of species diversity, therefore (and probably also appearance), the closest modern analogue to the prehistoric pasture would perhaps be a traditional wild-flower meadow. The floristic richness of the grassland is best illustrated by the *Curculionidae* (weevil) family, which was represented by a significant number of species at both Hasholme B and Skelfrey, the sites which had most coleopteran evidence of pasture. Weevils feed on blossoms or flowers of many kinds, and the host plants of some of the more stenotypic species include, various *compositae*, self heal, bird's foot trefoil, burdock, knapweed. wild chamomile and scentless mayweed.

The picture throughout much of the Bronze Age, therefore, is of a landscape with wetland vegetation in and around waterlogged areas on lower-lying land and well-wooded drier ground. The only evidence of human impact on the landscape that can be gleaned from the beetle evidence, is localised clearance, an activity that may have become more prevalent further inland away from the Humber.

The Iron Age

The marine transgression recorded in the stratigraphy and the diatoms of the Foulness Valley caused only very subtle changes to the beetle communities in the early Iron Age. With the onset of estuarine conditions, which caused the deposition of the upper clays at Hasholme Grange, it would be expected that those that could tolerate salt water would have replaced freshwater beetles, but, curiously, this failed to happen. The sample column was positioned on what appeared to be the edge of an ancient river channel, and in the three samples taken from the upper clays, there was not one true halophile, and there was only one species of beetle, the Chrysomelid, *Plateumaris braccata* (*Scop*) which could tolerate any sort of brackish conditions.

There were differences in the species composition from those samples taken from the top of the profile, however. It was noticeable that those species which live or pupate under water, such as most of the *chrysomelids*, whose larvae live under water among the roots and stems of the vegetation, were absent from the clay samples, with the exception of *P braccata.* [cf. Whitehouse 2004. Mineortogeny, environmental and climatic change inferred from fossil beetle successions from Hatfield Moors, eastern England.] The water beetles which persisted were primarily *Hydrophilidae*, which tend to live in and around smaller, more transient water bodies. The reason for this could be that salt water was entering the area, but, being denser than fresh water, did not mix to any great extent, but instead remained in a distinct zone in the bottom of the channel. The laminated appearance of the clays suggested that the river was subject to periodic flooding, and this surface floodwater, would be fresher, providing a suitable habitat for the freshwater *Hydrophilidae*.

In the early Iron Age, therefore, the beetles provide an indirect indication that the mid-Foulness valley was affected by the onset of estuarine conditions. Although the marine transgression, by allowing easier access to the area from the eastern seaboard, may have fuelled an increase in trade and activity in East Yorkshire, there is little evidence of any increased human impact upon the ecosystem at Hasholme Grange in the Iron Age. There may be some slight suggestion that the amount of woodland around Hasholme was decreasing in the late Bronze Age/early Iron Age, with the top clays containing fewer insects associated with woodland, but this may well be due to preservational differences between the clays and the peat, and so the scale of Iron Age clearance cannot be suggested with any certainty. What is certain, however, is that by the Roman period, much of the landscape had been cleared. Excavation of a Romano-British ditch feature at Shiptonthorpe (Palmer and Whitehouse 1994) yielded a collection of plant and insect macrofossils characteristic of open, cultivated land (see also Millett 2006, 280-304 for a more detailed discussion of the environment of the Shiptonthorpe site). At the end of the prehistoric period, therefore, humans changed the environment dramatically, and the patchwork of woodland and pasture was replaced by a dominantly cultivated landscape, which would probably not look unfamiliar to a resident of the Foulness valley today.

Section 3. The artefactual evidence

3.1 A Lower Palaeolithic hand-axe from Hotham (Fig. 4)

by Derek Roe

Introduction

The discovery of this artefact at Hotham is of more than ordinary interest, for at least two reasons. First, Lower Palaeolithic artefacts of any kind are rare in Yorkshire, which lies at the northern margin of known settlement of Britain during this period, and secondly the find-spot is on high open ground, rather than down in a river valley – the more usual location for finds of Lower Palaeolithic age.

Description

The hand-axe (Fig. 4) is made from flint, the original colour of which can be seen, where there is recent damage, to be pale grey, though the whole implement is now patinated white. The flint came from a nodule of somewhat irregular shape, with natural concavities, some of which survive on the hand-axe – one apparently filled with hard chalk. There is no reason to suppose that the nodule was of other than local Wolds origin. The butt of the hand-axe is unworked, and consists mainly of an area of pale-coloured cortex: the angles were such that it would have been extremely difficult for the maker to remove this cortex patch during manufacture, without drastically reducing the implement's size. The flint contains substantial grainy, cherty inclusions, and must have been far from ideal for hand-axe manufacture. Accordingly, the implement does not immediately give an impression of great refinement, but in fact the maker completed it with considerable skill, achieving a sharp and more or less symmetrical point, and long effective cutting edges at the sides. None of the scars necessarily results from the use of a soft hammer. A valiant and sustained effort was made to reduce the thickness of the implement below the tip by removing an awkward projection on one face (that shown in the figure), but this only created an area of battering and step-flaking, and left an irregular longitudinal ridge.

The hand-axe has a length of 111mm, a width of 74mm, and thickness of 38mm. Its length has lost two or three millimetres by breakage at the extreme tip, which was delicate enough above the area of battering referred to, but otherwise there is relatively little damage of a mechanical nature. There are, however, a number of fine frost-cracks on each face, and some of these have opened to produce small stepped thermal removals. This damage is relatively recent, since the scars are unpatinated, and it is clear that the process would have continued, had the hand-axe remained exposed on the modern surface: its discovery has saved it much further damage of that kind. It does not, however, look as if it had been exposed for a long period recently: the ridges and edges are unabraded and quite sharp to the touch, and there are no traces of weathering. The white patination probably does imply surface exposure in the past, especially since it is accompanied by spots and lines of iron-staining, which have tended to follow the ridges between the flake scars, and occasionally the more pronounced conchoidal rings of the larger flake scars. This combination of white patination and linear iron-staining is frequently found in flints that have lain on the surface of chalk uplands: one sees it on artefacts of Neolithic and Mesolithic character, as well as on Lower Palaeolithic hand-axes, for example on the North and South Downs.

The days have long passed when one could confidently use typology and technology to assign an age to a flint hand-axe, or attribute it to some particular stage of the Acheulian. Pointed rough-butted hand-axes of this kind are common in various gravel deposits of southern Britain: they are particularly strongly represented, for example, in the Middle Gravels at Barnfield Pit, Swanscombe, and this one, without its white patination, would look perfectly at home there. One should, however, keep in mind views recently expressed, notably by M. White (1995; White and Pettitt 1996), that the shape and size of the available units of raw material have a very important effect on the morphology of the hand-axes that are made at any given site. White argues that, for reasons of practical efficiency in use, flat ovate shapes, with continuous cutting edges right round the circumference, are likely always to have been the preferred hand-axe form, but flat nodules or tabular flint were needed for the manufacture of such implements. Pointed hand-axes with unworked butts were an acceptable compromise, at locations where only elongated nodules of more or less cylindrical form were to be had. While some may have reservations about the validity of this as a general rule, I am sure it will often have been a decisive factor, and it seems likely enough that the nodule used for making the Hotham hand-axe simply did not contain a flat, refined ovate hand-axe waiting to be released, so to speak. To make things worse from the point of view of classification, the implement is not of a particularly distinctive type within the whole range of pointed hand-axes: it is not a ficron, and it is not one of the plano-convex 'Micoquian' forms which are so important at the site of Wolvercote, Oxfordshire (Roe 1981, 118-28; Tyldesley 1986). One is simply left to classify it as a pointed hand-axe, and to guess that it is likely to date from the Middle Pleistocene, anywhere from Oxygen Isotope Stage 11 to Stage 6.

The find-spot

It is interesting to note that the hand-axe was picked up on the chalk Wolds at a height of some 145m above sea-level, at the head of Austin Dale (at approximately SE 9345 3450). Its original context seems likely to have been high ground, much as today. The large majority of British hand-axes, by contrast, have been recovered from gravels or other sediments in river valleys, many of them obviously derived – though occasionally numerous artefacts occur together in such deposits in fresh condition, evidently not far removed from their original place of manufacture or use. This has tended to create an impression that the Lower Palaeolithic people were exclusively inhabitants of lowland situations, especially riverside ones.

It is true that, all over the Old World, the banks and even the actual channels of seasonal watercourses, with the adjacent parts of the flood-plains, were favoured habitats for Lower Palaeolithic people. Such locations would have had much to offer: shade, protection, water, and various food and raw material resources. But in fact it is also quite clear that the high ground between the river valleys was regularly visited, and an excellent example of this is to be found in the distribution of finds on the chalk wolds and downlands of eastern and southern England. J. Scott-Jackson (1992; 1996). has recently carried out an extensive examination of the association of Lower and Middle Palaeolithic sites, with the rather variable deposits mapped as Clay-with-Flints that overlie the Chalk. Local studies carried out long before (which she summarises), include the work of W.G. Smith (1894) at Caddington, Round Green, Gaddesden Row and other sites in the Dunstable-Luton area, that of H.G.O. Kendall (1916) at Hackpen Hill, Wiltshire, and that of L.W. Carpenter (1960) at Lower Kingswood, Surrey. These authors were successful in locating traces of substantial Lower Palaeolithic sites, which had evidently remained essentially in place since the Middle Pleistocene, the material consisting of quantities of artefacts actually embedded in these superficial deposits, as opposed to surface finds. Julie Scott-Jackson herself excavated part of a similar Lower Palaeolithic site at Wood Hill, Kingsdown, near Deal, Kent, following up a previous discovery by G. Halliwell and K. Parfitt (1993). The higher ground of the English chalk downlands was not necessarily as open as it is today, and seems likely to have been an important part of the territory of hunters and gatherers (cf. Roe 1996, 4-5). Another attraction would have been the widespread occurrence of flint of tool-making quality, in the form of nodules eroding from the chalk; it is notable that the sites just mentioned all include typical knapping debris amongst the artefacts.

Quite apart from the places on the chalk downlands where concentrations of artefacts have been discovered, there are many isolated finds of Lower Palaeolithic flints, including typical hand-axes, which presumably were casually lost or deliberately abandoned as the owners ranged widely over the higher ground. This seems likely to be the explanation of the isolated hand-axe found near Hotham, and it would certainly be worth careful reconnaissance to see whether any *in situ* concentrations of Lower Palaeolithic artefacts can be found on the South Yorkshire Wolds. The Hotham find is a clear hint that such should once have existed, and some may survive, though it will be a matter of seeking areas which are fortunate enough to have escaped scouring by ice during Middle Pleistocene glacial advances – something which has not affected the chalk downlands further south, beyond the limits of the Anglian glaciation. Apart from that, the English chalklands have been subjected to other more ordinary kinds of erosion, and some archaeological material will inevitably have been swept away and re-deposited at lower levels, in derived condition, in the gravels of the rivers that form, or once formed, the various local drainage systems. It is hard to estimate how much Lower Palaeolithic material may still survive at high altitude, and also to find it, in places where today there is much grassland and exposures are not particularly common, except the rather unsatisfactory ones created by deep ploughing in the arable areas.

The regional context

Yorkshire lies at the northern edge of the known Lower Palaeolithic distribution in Britain, though it is certainly possible that people occasionally penetrated yet further, and that the evidence has failed to survive (see the discussion by Wymer (1988) and Saville (1993). Almost 30 years ago, my own enquiries when making the C.B.A.'s *Gazetteer of British Lower and Middle Palaeolithic Sites* led to the listing of 13 definite or probable find-spots of Palaeolithic artefacts in Yorkshire (Roe 1968, 313-14): none had yielded more than a single artefact, except one, which had two. The situation in the adjacent county to the south, Lincolnshire, was similar (17 find-spots), contrasting with the abundance of sites and artefacts in East Anglia, and making clear the reality of the dramatic fall-off in density of finds as one moved northwards.

While a number of new finds have come to light since 1968, the overall picture has not really changed. The latest general survey is that produced by John Wymer and his team for the second report of the English Rivers Palaeolithic Project (Wessex Archaeology 1996): Region 12 of their survey covers the Yorkshire and Lincolnshire Wolds, and they take the opportunity to mention other finds in the north of England. Today's county boundaries are different from those with which I had to deal in the 1960s, but the new figures that emerge are Lincolnshire, 29 find-spots; Humberside (South and North), 11; the rest of Yorkshire, 7 (Wessex Archaeology 1996, 125-44). To the Yorkshire figure of 7 can be added two more find-spots from the 1968 list (Victoria Cave and Kinsey Cave) which, as cave sites, would not have been included in the English Rivers survey, and the Hotham hand-axe was found after the English Rivers survey lists had been drawn up.

In summary, there has been a slight increase in the known Lower Palaeolithic material from this part of England, with more new finds south of the Humber than north of it. The majority of the new discoveries are single hand-axes, and there are still no prolific sites. No other Lower Palaeolithic finds seem to have been recorded in the near neighbourhood of Hotham, but perhaps that will change, if people will keep searching. The nearest find of a hand-axe was at Keyingham, east of Hull, where one was found by Mr P. Cambridge in the 1970s at Ken Hill Pit (Wessex Archaeology 1996, 140, 143). At least one good flake was found not far from there at Burstwick in 1930 (Burchell 1931a, 230-1). On the other side of the Humber, at Kirmington, several dozen flakes and other worked pieces were found in association with a marine beach which appears to be of Middle Pleistocene age (Burchell 1931b; Boylan 1966).

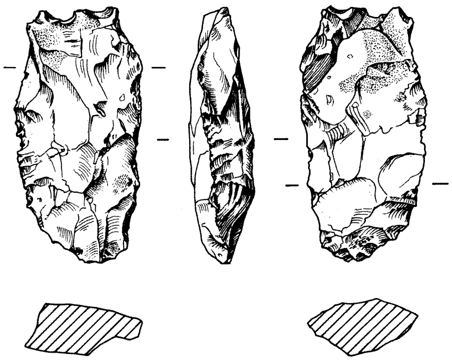

Figure 17 Mesolithic wedge-shaped heavy core tool from East Bursea Farm. Scale 1:3

3.2 Mesolithic core tools

a) East Bursea Farm, Holme-on-Spalding Moor
(Fig. 17)
by Terry Manby
Length 106mm; width 54mm; weight 135g (Fig. 17)
Material: Dense flint with some coarse-grained inclusions. Pale brownish, mottled orange patches and lighter areas. This is probably Wolds flint, its surface stained by iron salts; there area no fresh surfaces that allow any fresh raw material to be examined.

A wedge-shaped heavy core tool with bold bifacial flaking, it has small battering scars along the edges. Broad butt incorporating some of the nodular cortex, on one face the flakes have hinged off along a natural fault-line within the flint. Rounded cutting edge formed by narrow parallel flaking. This implement belongs to the early Mesolithic core axe/adze/pick series, but in this instance lacks the characteristic tranchet blow-sharpening technique. It falls at the arbitrary interface of the light and medium-sized ranges, but is short enough to require mounting in a sleeve for hafting.

b) unprovenanced
by Elizabeth Healey
An axe-head measuring some 125 x 54 x 34mm and weighing 240g, of irregular shape, made of grey-brown mottled flint with large and small cherty inclusions; this was once in the Holme on Spalding Moor County Primary School Museum. Its precise find-spot is unknown, though Mr David Waby of Holme-on-Spalding Moor recalls that it was found at Howe Hill, Holme on Spalding Moor, which would fit well with the other evidence for early Mesolithic activity presented elsewhere in this paper. Its left edge (viewed with the blade at the bottom) is flaked from alternate faces, but at too high an angle, causing some flakes to terminate in hinge fractures. The other edge is also thick, and there has been a large removal near the blade end, probably made in an attempt to thin it, but actually causing an irregularity in the profile. The blade has been shaped with flakes removed along the length of its axis, but on the reverse there are some small tranchet blows.

c) Howe Hill, Everingham
A further tranchet axe is recorded by Wymer and Bonsall (1977).

Tranchet axes are typical of earlier Mesolithic industries in the north of England (Jacobi 1978, 304). Although their function is uncertain, microwear analysis of those from Mount Sandel and Star Carr suggests chopping wood, and hide scraping or planing (Dumont 1989, 237).

3.3 Other chipped stone artefacts from the survey area (excluding axes)
by Elizabeth Healey

Introduction
The lithic artefacts described in this section were found during the survey. They are summarised in Table 8. The artefacts from each find-spot are treated as separate entities, which act as a catalogue of material from that particular area (terminology is as in Healey forthcoming). The results of the survey are summarised at the end of this section. Their significance within the context of the survey is discussed in the main body of the text.

	Original collection	**Present survey**
Cores	23	
Flakes	25	19
Blades etc.	58	14
Chips	23	2
Microliths: broad blade	23	
Geometric	42	
Other	19	
Truncated pieces	1	2
Scrapers	38 (the original note lists 58)	
Axes	3	
Knives	5	
Serrated pieces	1	
Piece with edge gloss		1
Piece with worn edge	1	
Denticulate	1	

The Sites (Figs 18-20)

Howe Hill Everingham (sand hill, now quarried away. Pl. 9; Fig. 18)
This site was first recognised in 1968 by Mr and Mrs Cutts who found three obliquely blunted points on the surface; it was subsequently excavated by the late John Bartlett. The finds are now in Hull Museum (KINCM 76.1969. 2b, 3 and 5); some of these were briefly re-examined (by the author), and are included here with the material collected during the present survey. It is presumed that the material listed in Wymer and Bonsall (1977, 350) is amongst this collection.

Thirty-nine pieces were collected during the present survey, and some 240 or more are in Hull Museum. The range of types present are summarised below:

Raw material:
There is a marked contrast in the use of raw materials. The creamy-white flint was preferred for blade production, whereas grey flint was also used for flake technology, and was only rarely selected for retouch (one knife and one out of 65 microliths). Blades of grey flint are noticeably smaller and squatter than those of the creamy-white flint.

Cores
The cores of creamy-white flint are all blade cores and have been worked to the point of exhaustion – the flake beds being much smaller than surviving blades. The scarring pattern of flake beds suggests that they were worked both uni-and bi-directionally. The cores of grey flint, on the other hand, are small and multi-directional or globular in form, and produced flakes.

Removals
Blade production predominates in the assemblage, and seems to have been used mainly for microlith manufacture, whereas flakes, forming a not insubstantial proportion of the removals, were preferred for retouch as scrapers. Amongst the complete blades the un-retouched ones range in length from 15 to over 50mm in length (although some microliths are over 60mm in length, suggesting that longer blades were present). There is a marked contrast in the size of blades made of creamy-white flint, and those made of the grey flint – 50% of those of whiter flint are over 40mm, but 90% of the blades of grey flint are under 40mm in length. The majority have all the hall-marks of soft hammer flaking (Ohnuma and Bergman 1982).

The flakes range in length from 15 to 50mm, in breadth from 11 to 50mm, and in thickness from 3 to 17mm. They

Table 8 Classification of flint artefacts from the HLB excluding axes

Site	Cores	Flakes	Blades	Chips	Arrowheads	Microliths	Scrapers	Other	Total
Howe Hill, Everingham		19	14	2				2 truncated blades 1 blade frag with gloss	**39**
Howe Hill HSM	4+(4 stn	101	6	326		1	3	1 retouched 1 pebble battered edge	**447**
Bloomhill Farm		1					1		**2**
Bursea Grange		1							**1**
Bursea House		4	2				5	1 retouched blade	**12**
Bursea Bramley Farm		2						1 retouched	**3**
East Bursea Farm	4	5	4					4 retouched edges	**17**
Hasholme Hall Pot Field		17	5		1 b & t		2	1 serrated 2 retouched 2 knives 1 chopper 1 fabricator	**33**
Hasholme Hills Grid-ded HH93	2 (+13 stm)	67	5				2	1 truncated blade 1 serrated 1 knife 1 hammerstone frag. 1 gun flint	**94**
Hasholme Grange	1 blade						1	1 blade retouched edge	**3**
Welham Bridge		2							**2**
Wholsea Grange			1				1		**2**
Woodlands Farm HSM		2	1		1 trans				**4**
Yokefleet Grange			2						**2**
Townend Farm, North Cliffe	2 +2	6					1	1 retouched	**12**
South Cliffe Common		9	2				16	1 piercer 1 sickle frag 3 retouched	**32**
South Cave		2	3	2			6		13
Chapel Farm	1		1						1
Hotham Common									1
Yokefleet Grange			2						2
Warren Hill Farm	1	13	4						18

tend to be struck from multi-directionally flaked cores, and to have wide plain striking platforms, and are unridged (Gingell and Harding 1981, types II and III).

Microliths
The microliths have been classified according to the position of retouch as follows:

Broad blade forms		*Geometric forms*	
Obliquely blunted points	14	Straight-blacked blades	7
Trapezes	3	Scalene triangles	27
Rhomboids	1?		
Isosceles triangles	2 + ?1	unclassifiable fragments	11
Convex-backed pieces	2	not seen	8

The largest of the broad-blade microliths measures over 60mm in length, but most fall between 40 and 50mm; width is consistently between 10 and 14mm. Two of the obliquely blunted points have retouch on their leading edges, and several appear to have been snapped. Three have damaged tips, one with possible impact damage (Barton and Bergman 1982). Apart from one obliquely blunted point which still has its butt end intact, all the others are made on distal parts of blades. There is, however, no evidence to indicate whether or not the micro-burin method of manufacture was used. Two have been retouched on an anvil.

The geometric forms include straight-backed pieces, and two pieces with retouch forming a convex back which continues onto the butt. The majority, however, are clearly scalene triangles of Jacobi's classes 7a1 and 7a2.

Truncated pieces
Two blades (nos. 1 and 2) recovered during the survey have distal ends which have been truncated by abrupt retouch – one obliquely and one straight.

Scrapers
There are a substantial number of scrapers amongst the assemblage in Hull Museum. The majority are made on creamy-white flint, but mottled grey and mid-brown flint are also used. All scraper retouch is on flake blanks, seven of which retain a small patch of cortex. Ten of the blanks have been struck from changed orientation cores. They have been subdivided as follows:

Location of retouch	*edge*	*semi inv*	*30 mm +*	*15- 25 mm*	*uncl*
end	10	2	7	5	
ext end	9	8	10	5	2
end & side	2	6	3	4	1
Total	21	16	20	14	3

The retouch varies from nibbling edge retouch (3 examples), through edge retouch, to semi-invasive scale flaking. Two have been inversely retouched. The contour of the scraping edge is generally rounded, but some are slightly flattened, and one is straight. The angle of retouch tends to be fairly abrupt. In addition to the more formal scrapers, three pieces (not included in the above totals) had minimal edge retouch.

Serrated piece
One blade fragment (not illustrated) has a band of gloss on the ventral face, and abrupt chipping on the dorsal face. This blade was examined under high magnification and exhibited a micro-polish consistent with plant processing (pers. comm. Cameron Smith).

Other
One snapped blade (no. 3) has a facet struck from the break parallel with the longitudinal axis of the blade. Although it superficially resembles a burin, the facet is probably fortuitous.

Summary
The assemblage of flint recovered from Howe Hill, Everingham includes artefacts from most stages in the core-reduction process, and it is likely that the flint was reduced and tools manufactured on the site. If what was recovered is representative of the original industry, then it would fall into Mellars' (1976) type B lowland assemblage, assuming that at least some of the scrapers and microliths are contemporary.

The broad blade microliths indicate an early Mesolithic date, but with activity continuing into the later Mesolithic, as indicated by the small geometric microliths (Jacobi 1978). The rest of the tools are not diagnostic enough to attribute them to a particular technology, and it may be noted that those with more invasive scale-flaking would not be out of place in a post-Mesolithic industry.

Eerkens (1997; 1998) has indicated by using analysis of variance (on data from the Howe Hill microliths) that the microliths in earlier Mesolithic assemblages are more standardised in shape than in later ones. He suggests that because early Mesolithic hunting was intercept-based and seasonal, a reliable weapons system could be used (i.e. they could be made in advance), whereas in the later Mesolithic, tools were needed all the year round, and hunting was encounter-based, and so needed a maintainable technology – hence, there would be more variation in the microlith forms. He suggests that this could be due (amongst other things) to functional and social factors.

Howe Hill, Holme on Spalding Moor (Fig. 18)
The 429 flint artefacts from this area were collected during a gridded survey in March 1991 (see above). They are summarised below, together with some chance finds made in 1990 at SE 8065 3965, and others in 1997. Some material now in Hull Museum (and boxed with Howe Hill Everingham) may have also come from this site, but cannot now be attributed with any certainty.

	Gridded	*1990*	*1997*
Cores	1	3	-
Struck nodules	2	2	-
Flakes	92	6	3
Blades	4	-	2
Chips	326	-	-
Microlith	1	-	-
Scrapers	2	-	1
Misc. Retouch	1	-	-
Other	1 (pebble with battered edge)		

Small unworked pieces of chalk and sandstone were also recovered

Grey flint seems to have been preferred for blade manufacture, including the cores and the microlith.

This collection contained many chips and small flakes of white flint, some weathered, and several chunks, which are for the most part, the result of thermal fracturing. However, a group of struck fragments and chips in grid

Plate 9 Fieldwork at Howe Hill, Home-on-Spalding Moor in 1987.
This picture shows how the hill contrasts with the surrounding wetland

square 16E 9S may be the remnants of a single knapping episode.

Removals:
Apart from one preparation flake, the flakes are mostly small or fragmentary, so that little technological information can be gained from the 12 flakes which are complete enough to indicate the flake class: 7 are ridged (Gingell and Harding 1981, classes Ia and Ib) and the other 5 are unridged (class III), but only six are complete and measurable. They range in length between 11 and 21mm, 9 and 24mm in width and 2 to 5mm in thickness. Of the complete blades, two measuring respectively 42 x 12 x 5mm and 31 x 10.5 x 3mm, are of pale grey flint, and the other of mid-brown semi-translucent flint. The third distal fragment is of opaque grey-white flint.

Cores: Both flake and blade cores are present. All seem to have been flaked down to the end of their useful life. They are all uni-directional, although the truncated scars on no. 5 suggest that it is in a secondary stage of use. This core produced blade-like flakes, similar in size to those present in the assemblage; there is no evidence of platform preparation, and the overhangs have not been trimmed away. Another core (no. 4) has a single platform and cortex on its apex, suggesting that the original piece of raw material was not large; there is a possible facet on the striking platform. The step-fracturing on the face of the core, together with the size of the core, may have been the reason for its abandonment. No. 6. is an irregular single-platform core.

The *microlith* (no. 7; site grid co-ordinates 13E 7S) is of small narrow blade geometric form (Jacobi's (1976) class 7a. 16 x 5 x 2mm.

Of the *scrapers* one (no. 8) has been made on the end of a blade (now broken). It has been abruptly retouched, forming a rounded end (24 x 16 x 6mm). Another (no. 9) is a small squat flake (24 x 26 x 5mm) with fairly minimal retouch on the ventral surface. A third (no. 9a) was recovered in 1997; it is a small discoidal thumb-nail or button scraper masuring 16 x 15mm.

Other retouch: A squat flake (no 10), measuring 30 x 25 x 5mm, has irregular semi-invasive retouch in a concave area which truncates its butt. This could have been caused by post-depositional damage.

Summary
The only securely datable artefact present is the small geometric microlith of late Mesolithic date. One of the scrapers (no. 8) would not be out of place in a Mesolithic assemblage. Although there is some uncertainly as to contemporaneity, the flints recovered during the survey come from all stages of the core-reduction process.

Bloomhill Farm (SE 8101 3316; Fig. 18)
Only two lithic artefacts were recovered from this location. They include a small flake and a scraper. The *scraper* (no.

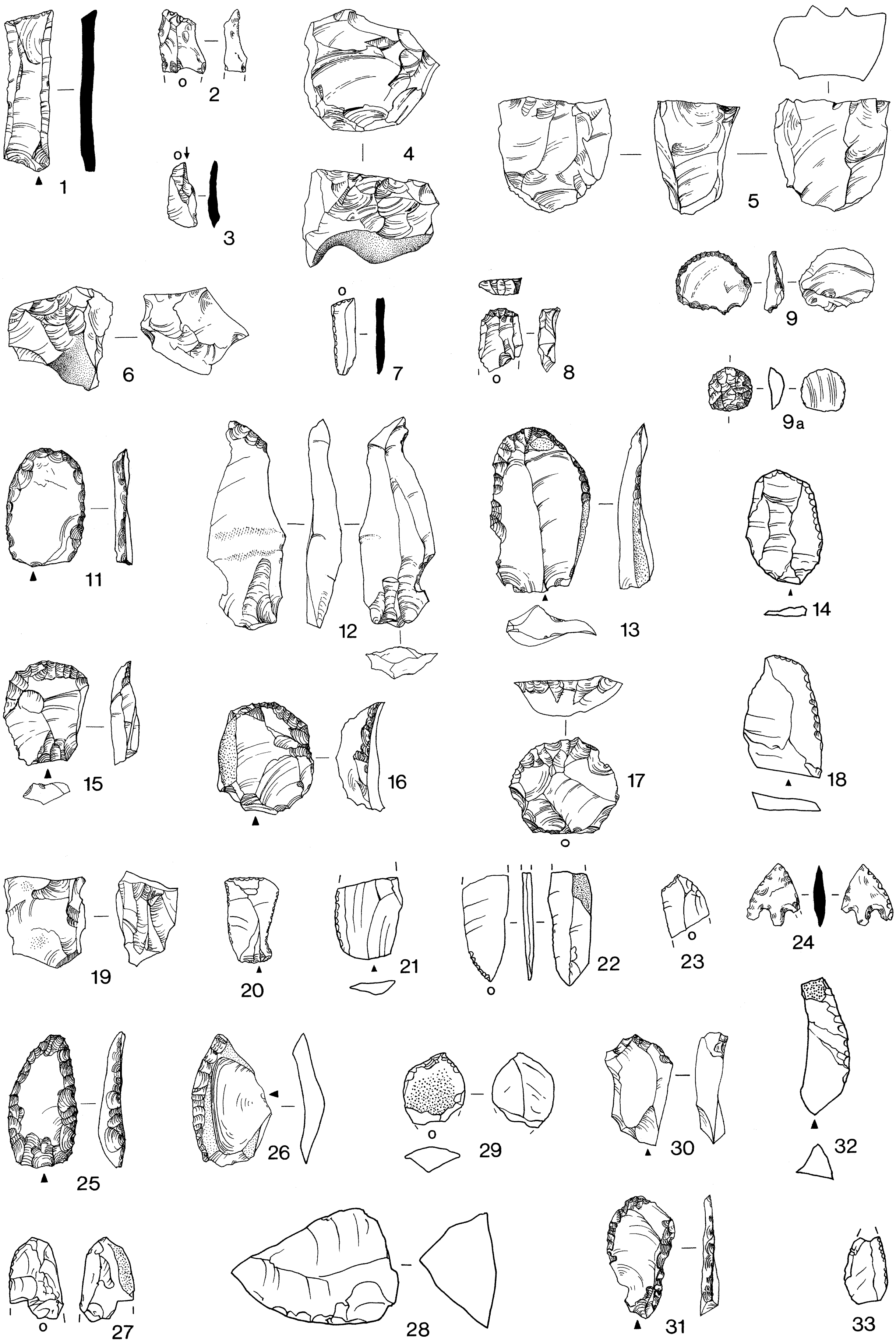

Figure 18 Flints from various sites; nos 1-33. Howe Hill, Everingham, blades, and a snapped blade (nos 1-3); Howe Hill, Holme-on-Spalding Moor, cores, microlith, scrapers, and a retouched flake (nos 4-10); Bloomhill Farm (no. 11); Bursea House, retouched blade, and scrapers (nos 12-17); Bramley Farm, Bursea, flake (no. 18); East Bursea Farm and Chapel Field, blade core, retouched flake (nos 19-20); Hasholme Hall, flake, blades, arrowhead, knives, fabricator, chopper, scrapers, and retouched flake (nos 21-33). Scale 1:2

11) is on a relatively large blank (42 x 28 x 6mm) of whitish-grey opaque flint, with a plain striking platform, and diffuse bulb of percussion. The retouch is semi-abrupt and extends around three-quarters of the circumference, and is rubbed or slightly worn near the butt.

Date: uncertain, probably post-Mesolithic.

Bursea Grange (SE 817 343 KINCM 1986 1392 + u/s)
A single flake was found during the excavation of Bursea Grange (Halkon and Millett 1999). It is a wide blade-like flake of creamy-white flint, with a plain striking platform and diffuse bulb of percussion. There were also two pieces of thermally fractured non-artefactual pieces of flint.

Bursea House (Fig. 18)
Twelve artefacts were found at the following locations on this farm between 1983 and 1985. They may be described as follows:

	Flakes	*Blades*	*Scrapers*
SE 810 331	1	-	-
SE 811 331	-	1	1 (no. 14)
SE 812 334,	-	-	1
SE 8125 3310	1	-	-
SE 8130 3295	-	1 (retouched)	-
SE 813 338 (site B4)	-	-	1 (no. 13)
KINCM 418. 1983	2	-	1 (no. 15)
KINCM 1249.1984	-	1	-
Carr near Bursea House	-	-	1 (no. 16)

Removals
The flakes include a trimming flake (60 x 50 x 19mm) of opaque cherty white flint with a wide striking platform, one flake with some cortex from a changed orientation core (37 x 26 x 6mm), and two other flakes, both with uni-directional scarring on the back. One of the butts is plain, and the other dihedral; both have diffuse bulbs of percussion (30 x 19 x 5mm and 36 x 47 x 10.5mm). All are ridged (Gingell and Harding 1981, classes Ia or Ib). The complete blade has been struck from a bi-directional core; it measures 56 x 16 x 4mm, and has a small plain striking platform, with a diffuse bulb of percussion and a lip. There is also evidence on its butt of the core being trimmed before the blade was detached from it. The other blade is fragmentary and less regular, but has similar evidence of soft-hammer flaking.

The *retouched blade* (no. 12) is large (76 x 27 x 10mm), of pale white-grey opaque flint. It has been struck from a uni-directional core, and has a retouched semi-circular lateral notch, and some inverse flaking (probably damage) on the distal end. There is a patch of high gloss on a prominent ridge on the ventral face, probably from rubbing in the soil.

The *scrapers* form a heterogeneous group and may be described as follows:

No. 13: Blade-like flake of brown-grey flint with a small patch of cortex towards the distal end, with a wide plain striking platform, with a ring crack (possible evidence of use of hard hammer). Retouched with semi-invasive scale flaking on distal end continuing down both sides. 57 x 38 x 12mm. Gingell and Harding 1981 class Ia.
No. 14: Blade-like flake stuck from a bi-directional core, with a trace of cortex. The striking platform has two scars and diffuse bulb of percussion. Distal end has abrupt retouch, which continues down the right side, becoming flatter and slightly more invasive towards the butt. 38 x 29 x 7mm. Gingell and Harding 1981, class Ib.
No. 15: Squat flake of pale grey opaque flint, burnt. Uni-directional scarring, and plain butt with resolved bulb of percussion. End retouched with regular serial flaking. 35 x 32 x 9mm. Gingell and Harding class Ia.
No. 16: Squat flake with multi-directional scarring and some cortex. Butt removed. Abrupt serial and scale flaking on distal end and right side. 40 x 35 x 15mm.
No. 17: Discoidal scraper (damaged) on a flake of good quality flint, struck from a multi-directional core. Retouched with semi-invasive scale-flaking. 34 x 39 x 12mm.

Summary
It is unlikely that the artefacts described above come from a single industry. The blade may be of Mesolithic date. The shape of the scrapers and the style of retouch suggest a Neolithic date.

Bramley Farm, Bursea (SE 810 355; Fig. 18)
Three flakes were recovered between 1983 and 1985. Two are of cherty flint, and rather weathered. One has chipped edges, probably damage. The third piece (no. 18) is a flake of whitish flint, burnt, with bi-directional scarring on its dorsal face, a plain butt and diffuse bulb of percussion. It has a relict margin and terminates in a hinge fracture. It has been abruptly retouched on the right side and distal end. 40 x 29 x 9mm.

East Bursea Farm (SE 805 332) ***and Chapel Field*** (SE 8062 3383; Fig. 18)
Twelve artefacts were recovered in October 1982, and a further five in November 1997 from the following locations:

	Core	*Flakes*	*Blades*	*Retouched*
SE 805 332	1 (no 19)	3	3	3 (nos. 20 and 21)
SE 8062 3383	-	1	-	-
SE 816 330	-	-	-	1 prob. natural
SE 8100 3331	l frag	-	-	-
SE 8105 3330	I?	1	-	-
SE 8105 3330	1	-	-	-

Two of the cores are blade cores; no. 19, is a small single-platform blade core, measuring 33 x 29 x 22mm. The striking platform is plain, and there is no indication that the platform edge was retouched. There is quite an amount of cortex on the core. It was probably discarded because of step fracturing on the face. The other blade core is a relatively large bi-directional blade core, which has been carefully shaped. It is of whitish-grey opaque flint, measures 77 x 28 x 42mm, and weighs 100g.

A third piece, also of whitish-grey opaque flint (from SE 8105 3330), is a single platform blade core (only two removals); the end of the nodule has been thinned by two transverse blows, so that it looks superficially similar to a pick. The other fragment is of brown-grey mottled flint, but is unclassifiable.

The blades include the distal fragment of a large blade (the surviving portion measures 61 x 36 x 11mm) from Chapel Field, and two blades with uni-directional scarring, one fragmentary, and two trimming pieces. The complete blade (45 x 13 x 5mm) has a narrow striking platform, a diffuse bulb of percussion, a lip, and trimming or rubbing on the core edge. The other blade has been struck to remove a hump on the core face, and has a narrow striking platform, a diffuse bulb of percussion, and a lip; it measures 49 x 17 x 12mm. Both complete blades are ridged (Gingell and Harding 1981, class 1). One of the trimming flakes has the remnants of truncated scars from cresting. There are two small flakes (under 25mm in maximum length) with butts and diffuse bulbs of percussion. There are also two large flakes (85 x 70 x 18.5mm and 72 x 5 x 25mm), one of which is slightly corticated, has multi-directional scarring on its dorsal face, and terminates in a slight hinge. It is similar to flakes associated with the early stages of biface manufacture (Newcomer 1972). The other flake is very thick and heavy, and has sporadic retouch.

The retouched pieces include a flake (no. 20) with uni-directional scarring and several diffuse bulbs of percussion, perhaps indicating a mis-strike; the distal end and both sides of this flake exhibit abrupt nibbling edge retouch 30 x 20 x 4mm. No. 21 is the fragment of a flake struck from a changed orientation core, with a faceted striking platform, and diffuse bulb of percussion. It has abrupt retouch on the left edge, and measures 31x 24 x 6mm. There is also a blade-like piece, measuring 40 x 28 x 14mm. with uni-directional flake scars and cortex on one side, a plain striking platform, and diffuse bulb of percussion, which has semi-invasive retouch on its distal end.

Summary: Nothing diagnostic, but blades and blade cores suggest activity during the Mesolithic; the bi-directional blade core suggests that it might be early Mesolithic. Further support for this is the tranchet axe-head from this site (see section 3.2a above).

Hasholme Hall (Fig. 18)
Artefacts have been recovered between 1970 and 1982 from the following locations in this area.

Both creamy-white opaque and grey semi-translucent flint have been used, the former being about twice as common.

The diverse location of the artefacts collected makes it almost impossible to say anything meaningful about reduction strategies, beyond the fact that both flakes and blades were being produced. Flakes seem to have been used for scraper retouch and for knives. Eight out of the 18 flakes have areas of cortex on them, and the dorsal scarring pattern indicates that some changed orientation cores were being used; these tend to be unridged, but others are from more systematically worked cores, and follow the scars of previous removals. There are two largish flakes measuring 45 x 49 x 15mm and 56 x 45mm, the first of which with a patinated striking platform, perhaps indicating the reuse of material. There is also a flake of grey brown flint with inclusions, struck to remove a keel from a core; it also has a battered butt. 53 x 30 x 20mm.

Two of the unretouched blades and a bladelet (HH4) have been struck from uni-directional cores, with trimmed edges to the striking platform; both are of Gingell and Harding's (1981) ridged type (class I). A third blade (no. 22) has a small amount of cortex on it, and has been serrated (see below). There are also two segments with uni-directional scars on them.

Arrowhead
A small barbed-and-tanged arrowhead of pale grey flint (no. 24) has invasive bifacial flaking all over both faces. It measures 21 x 18 x 4mm, and falls into Green's Sutton type (Green 1980; 1984, 29).

Knives
Two knives with semi-invasive scale flaking are present. No. 25 is bi-serially retouched, and is almost plano-convex in form; there is also some flaking on the ventral face at the butt end. It measures 49 x 25 x 8mm. It is made on good quality black flint with large inclusions. The other is on the distal end of a dished flake of greeny-brown flint, with a wide plain striking platform, and diffuse bulb of percussion (Gingell and Harding 1981, class III), which has regular semi-invasive serial flaking, which becomes scalar at the edges. 48 (= width of flake and length of knife) x 29 x 8mm.

Scrapers
The scrapers form a heterogeneous group: no. 30 has irregular retouch around the end of a flake struck from a changed orientation core, with a dihedral butt and diffuse bulb, struck slightly skewed to the axis of the core (Gingell and Harding 1981, class I). 37 x 25 x 9mm. No. 29 is a cortical flake with minimal edge retouch around its distal ends 23 x 21 x 9mm. No. 31 is a flake with uni-directional scarring on its back and a dihedral butt; it has flattish retouch on its distal end, and retouch continuing down the side, quite abruptly on the right, and with inverse retouch in a notch on the left, forming a tang. 40 x 27 x 5mm. No. 32 is a possible edge-renewal flake, with scraper-like retouch on the edge of a flake, forming a rounded contour.

The *serrated blade* (no. 22) has had its butt end retouched away, and has irregular serrations on its edges. There is a band of gloss, visible to the naked eye, which microwear investigations suggest may have been caused by plant processing. There is also some rounding on the dorsal ridge which is visible under magnification (pers. comm. Cameron Smith). 39 x 16 x 6mm.

No. 23 is a fragment with abrupt nibbling edge retouch, truncating the distal end of a pale grey blade-like flake, struck from a changed orientation core.

The *fabricator* (no. 27) is made on a flake of flint with a flattened rod-like cross-section and retouch forming a rounded point; the edges are heavily crushed. Hard pebble-like cortex. 28 x 23 x 13mm.

The *chopper* (no. 28) is made on a struck nodule of

	Flakes	*Blades*	*Scrapers*	*Other Retouched*
Pot Field 1971 HAS K10	7	2	1 ? (no. 32)	1 arrowhead (no. 24) 2 knives (nos 25 and 26) 1 serrated (no. 22) 1 chopper (no. 28)
HH2 SE 818 330	3	3	2 (nos 29 and 30)	1 fabricator (no. 27)
HH3 SE 824 533	1	-	1? (no. 31)	-
HH4 SE 8287 3370	-	1	-	1 edge retouch (no. 33)
17.10.81	2	1	-	-
'Hasholme Hall'	2	-	-	1 ?edge retouch (no. 23)

opaque pale-grey flint and a hard pebble cortex, probably too irregular to be a core, the thin edge of which has been abraded and exhibits bifacial chipping, as if from a chopping action.

Other retouch includes a small flake (no. 43) with abrupt nibbling edge retouch on a burnt flake with a plain striking platform. 24 x 15 x 4mm.

Summary: Although no cores were found, the flakes of various sizes and those with cortex suggest that core reduction was being carried out in the vicinity. The most clearly datable pieces are the knives, which are probably late Neolithic/early Bronze Age, and the barbed-and-tanged arrowhead which is also early Bronze Age, possibly Beaker.

Hasholme Hills (gridded survey HH 93; Fig. 19)

The flint described below was collected during the survey of an area 130 x 90m using a grid of 10m squares. The material collected has been classified as follows:

Cores	2 (and 13 struck nodules)		
Flakes	67		
Blades	5		
Truncated blades	1	(H8)	no 34
Scrapers	1 + 1?	(I5 and G3)	no 35
Serrated piece	1	(I2)	no 36
Knife	1	(E1)	no 37
Hammerstone frag.	1	(H2)	
Gun flint	1		

A variety of colours of flint were present including white, grey and brown. The gun flint is of black flint and of completely different flint from that used for the prehistoric artefacts. Some of the flint had been burnt, but this is probably the result of recent fires. The distribution of the material suggests localised activity episodes within a general background scatter.

The proportion of *flakes* (over 90%) and the flake cores in the assemblage suggest that flakes were the main focus of reduction, though there was a rejuvenation piece associated with the blade technology. Amongst the flakes are three preparation pieces and several chips indicative of flint knapping. The flakes are struck from uni-directional and multi-direction cores in almost equal proportions. Striking platforms are plain, and about one-third of the flakes are unridged. Hinge fractures are rare. The flakes range in length from 10 to 65mm, and 9 to 40mm in width, and 2 to 13mm in thickness.

Amongst the retouched material there is a *truncated blade* (no. 34) which has abrupt edge retouch truncating transversely a blade-like flake of brown cherty flint.

The *scraper* (no. 35) from square I5 is a small extended end scraper (18 x 18 x 6mm), and is made on a flake of creamy-brown flint, with a dihedral butt with uni-directional scarring on its back. The other example (not illustrated) is less regular, with retouch on the end, but with an irregular outline. It is on a flake of white flint, with a plain striking platform measuring some 30 x 28 x 12mm. The *knife* (no. 37) has retouch on the side of a flake (broken) of white flint, with a hinge termination. A blade-like fragment with parallel edges (no. 36) possibly had serrated edges.

Summary: Core reduction was clearly taking place in the vicinity. There is nothing particularly diagnostic in the assemblage, though a post-Mesolithic date is suggested by the flake technology, and the small scraper, of a form which is typical of later Neolithic and Beaker industries (Bamford 1982, 27).

Hasholme Grange (SE 8240 3271; Fig. 19)

Three artefacts were collected in September 1982 – two labelled HS5, and one HG 3.

There is a largish *blade core* (no. 38) of opaque grey, brownish-white flint with chert inclusions. It has had blades detached from both ends; the striking platforms are plain, and there is trimming between the edge of the striking platform and the core face. There is also some step fracturing on the face of the core at one end, perhaps the reason for its abandonment. 59 x 30 x 27mm.

The *scraper* (no. 39; labelled HG 3) is a flake of semi-translucent flint, with hard smooth cortex over most of its dorsal surface, and with a dihedral butt, a diffuse bulb and a slight lip. The scraper retouch extends around the distal end and slightly down one side. There is a convex area at the end, 26 x 29 x 7mm.

The *other retouched* fragment (no. 40) is the butt end of a blade of brown opaque flint with large inclusions. The striking platform is plain, and the bulb diffuse, with slight trimming on the butt. There is irregular abrupt edge retouch on the right edge. 25 x 26 x 8mm.

Date: The blade core suggests a Mesolithic date.

Wholsea Grange, Holme on Spalding Moor (SE 8490 3460; Fig. 19)

A large blade-like flake and a scraper were recovered from this location. The *flake* (no. 41) is of mid-brown-grey flint with some inclusions, but of good flaking quality. It has uni-directional scarring and some cortex on its dorsal surface; the striking platform is faceted, and the bulb diffuse. 66 x 30 x 5mm.

The *scraper* (no. 42) is a squat flake (broken), with uni-directional flake beds on the dorsal surface and irregular retouch on the distal end, including step fracturing on the edge, but more acute and regular retouch on the right edge. The left edge has minimal retouch, which towards the butt is inversely executed. (33) x 33 x 5mm.

Woodlands Farm (Fig. 19)

Four artefacts were recovered in 1984, and include a flake (35 x 30 x 7mm) with a cortical striking platform, a trimming flake (24 x 24 x 7mm) with a plain striking platform and a relict margin, as well as a blade of opaque grey flint measuring 45 x 22 x 6mm, and a narrow striking platform. There is also a finely flaked transverse arrowhead. (no. 43) with bifacial flaking forming concave edges. It is likely to be of later Neolithic date (Green 1984).

Townend Farm, North Cliffe (SE 875 384; Fig. 19)

Twelve artefacts and two thermally fractured pieces of flint were recovered during line-walking, and have been classified as follows:

Cores	2 and 2 struck nodules
Flakes	6
Scraper	1
Retouch	1

The *cores* are both small. No. 44 is of brown flint, and has had flakes removed from it in several directions (multi-platform type). 30 x 25 x 14mm. The other (not illustrated) is a small pebble of white flint with a chalky cortex, which

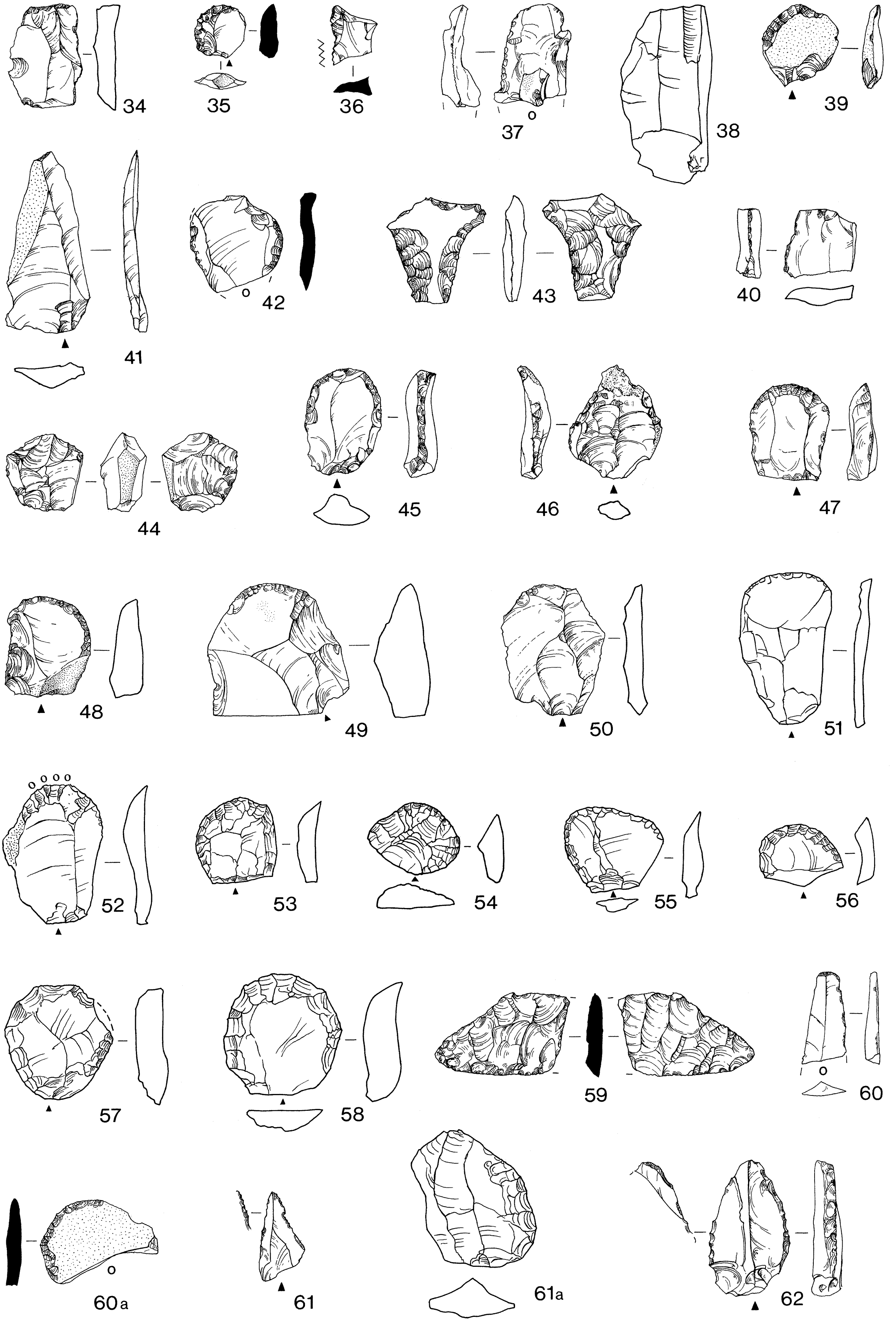

Figure 19 Flints from various sites; nos 34-62. Hasholme Hills, truncated blade, blade-like fragment, scraper, and knife (nos 34-7); Hasholme Grange, blade core, scraper, and retouched fragment (nos 38-40); Wholsea Grange, Holme-on-Spalding Moor, blade-like flake, and scraper (nos 41-2); Woodlands Farm, arrowhead (no. 43); Townend Farm, North Cliffe, core, flakes, and a scraper (nos 44-6); South Cliffe Common, flakes, sickle, blades, and scraper (nos 47-62). Scale 1:2

has been irregularly flaked. The struck nodules are pebbles of grey flint, with random struck and thermally detached scars.

The *flakes* include a preparation flake and other ridged flakes. No true blades are present, but one piece has blade-like proportions. They range in size between 28mm and 40mm in length, 27 to 35mm in width, and 9 to 10mm in thickness. They have uni-directional flake scars on the dorsal surfaces. The larger pieces have been retouched – one as a scraper (no. 45), and another (no. 46) on its edge; the flake is pointed, and with a splintered butt; the retouch is through the patina, and may be attributable to later damage.

The *scraper* (no. 46) is on a ridged flake of grey flint, with a plain striking platform, with retouch around its distal end, and continuing half-way down the left edge and down to the butt on the right. 40 x 27 x 9mm.

Summary: The collection, though not from a particularly concentrated area suggests flint-working, probably of post-Mesolithic date.

South Cliffe Common (Figs 19 and 20)

The artefacts have been collected from eroded sandy patches over several years in five locations by Mr Mott comprising:

Cores	
Flakes	16
Blades	1
Arrowhead	1
Scrapers	20
Piercer	2
Sickle fragment	1
Retouch	3
Sandy Camp	spherical pebble with old truncated scars

A wide variety of flint has been used, but most probably originated from the tills.

The *flakes* include a preparation flake of white flint 38 x 33 x 9 mm with a plain striking platform. The other complete flakes range in size from 27 to 48 mm in length, 28 to 38 mm width, and 7 to 12 mm in thickness. Striking platforms are cortical or plain, and most are ridged flakes (Gingell and Harding classes 1a or 1b). Distal terminations are feathered or hinged. One flake (no. 62) has retouch along one side, that continues inversely onto the distal end, which is hinged, possibly forming a piercer. No. 61 is a flake of grey flint with a small butt, measuring 32 x 20 x 4 mm, with retouched edges converging at a point, and is perhaps best described as a piercer. There are also two blade fragments, one with a rounded and retouched end, no. 60, which appears to be worn smooth.

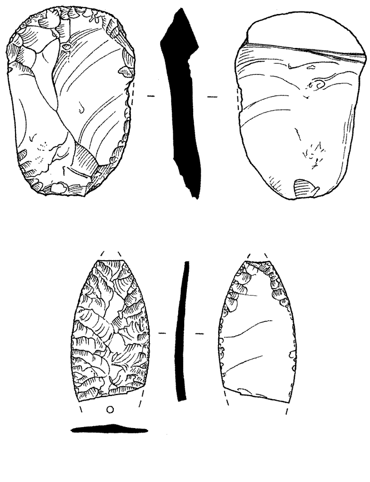

Figure 20 Flints from South Cliffe Common. Scale 1:2

Fragment no. 59, described as a *single-piece sickle*, has been bifacially flaked. The retouch is bolder than that generally found on an arrowhead, and its curved shape and slightly asymmetric section suggest that it may be a fragment of a single-piece sickle.

The arrowhead is a slender leaf-shaped form, broken at both ends, and made from mid brown-grey flint with darker inclusions – probably till flint. It is long and relatively slender in shape, and is probably of Green's type 2c (1984, 21). The original blank form is no longer determinable. The arrowhead has invasive sub-parallel pressure flaking all over the dorsal surface, apart from one small area. The distal end is bifacially worked, though the flaking on the ventral surface is only partially invasive, and only on the distal third of the arrowhead. The edge of the blank has been lightly rubbed to provide a platform from which to execute the retouch; this has caused some spalling on the ventral face. The sequence of removal shows that the arrowhead was retouched on the left side first, starting at the distal end. Large slender leaf-shaped arrowheads such as this are commonly associated with 'Towthorpe tradition' burials in East Yorkshire (Green 1984, 33; Manby 1988, 52).

The *scrapers* can be subdivided according to the position and extent of the retouched as follows:

extended end	6	nos. 47 – 52
end and side	5	nos. 53 – 56
discoidal	3	nos. 57 –59a
side	1	no. 61a

They are made on squat, medium-sized robust flakes, ranging in size from 28 to 54 mm in length, 28 to 54 mm in width, and 3 to 12 mm in thickness. The pattern of dorsal scarring suggests that the flakes have been struck from uni-directional and multi-directional cores. Only two have cortex left on their dorsal surfaces. One is made on an *outre passé* flake. Striking platform remnants are plain, except for one faceted example. Retouch is serial on extended-end forms (nos 47 and 50), and scale flaking on the larger, thicker examples. Two have a narrow band of gloss, one on the retouched scraper edge, and one on the side.

No 47. Flake of white flint with uni-directional flake scars and a plain butt, with a prominent bulb of percussion. Semi-abrupt serial flaking on distal ends and partly on to the sides, forming a rounded contour. 36 x 30 x 10 mm. Gingell and Harding class II?

No. 48: Flake of black flint from a changed orientation core, with some cortex on its dorsal surface and butt end. Edge retouch around distal end and partly down one side. 36 x 33 x 12 mm. Gingell and Harding class III ?

No. 49: Flake of white flint with blotches, from a changed orientation core with a plain butt and diffuse bulb. Edge retouch around distal end continuing partly on sides. 52 x 54 x 18 mm. Gingell and Harding class Ib?

No. 50: Flake of opaque white flint with uni-directional scarring on back, and a plain butt. Minimal edge retouch on distal end. 47 x 38 x 6 mm. Gingell and Harding class I.

No. 51: Flake of grey flint with a plain butt and diffuse bulb of percussion and a slight lip. Dorsal surface and retouch damaged by burning. 54 x 30 x (8) mm. Gingell and Harding class Ib.

No. 52. Flake of pinky-brown-grey flint with a small patch of softish cortex. Butt end plain, and fairly diffuse bulb of percussion. Semi-invasive serial flaking across distal end extending briefly down the sides; band of gloss on ventral face adjacent to the scraper retouch. 50 x 37 x 7 mm. Gingell and Harding class II.

No. 53: Flake of light brown-grey mottled flint with a faceted butt and double bulb of percussion, and a relict margin. Semi-invasive retouch, and abrupt retouch on distal end, becoming flatter towards butt. 30 x 28 x 9 mm. Gingell and Harding class Ib.

No. 54: Thick flake of semi-translucent mid-brown flint with small white mottling, a narrow butt and diffuse bulb. Semi-invasive scale flaking, which is quite abrupt in parts. 28 31 x 12 mm. Gingell and Harding class Ib.

No. 55: Flake of mid-brown flint with some light mottling and dark inclusions; plain butt with diffuse bulb of percussion. Edge retouch on straightish distal end and on left side; right side slightly chipped. 31 x 35 x 10 mm. Gingell and Harding class Ia.

No. 56: Squat flake of white flint with a wide plain butt and a diffuse bulb of percussion. Semi-invasive serial flaking around ends and side forming a flattened rounded contour. 22 x 30 x 8 mm. Gingell and Harding class III.

No. 57 Flake of whitish-grey flint with a small butt and prominent, pointed bulb of percussion. Abrupt retouch on ends and sides of blank, becoming shallower towards the butt. 42 x 36 x 12 mm. Gingell and Harding class Ib

No 58: Flake of white flint, some iron staining, with a plain butt and fairly prominent bulb of percussion. Semi-invasive flaking around ends and sides, which undercut at distal end. 45 x 42 x 14 mm. Gingell and Harding class Ib.

No. 61a Flake of lightish brown flint struck from a changed orientation core. which has removed part of the distal end too; a wide butt and prominent bulb of percussion. Semi-invasive scale flaking on distal end forming a rounded contour. 43 x 50 x 17 m.

Date: The finds suggest activity over a long period. It is tempting to see the blade with the worn end as Mesolithic, especially as it came from an area (SE 859 359) where microliths have been found previously (see also Wymer and Bonsall 1977, 354). More recently, chips and other debitage have been noted too (Mr Mott pers. comm.). Neolithic activity is attested by the leaf-shaped arrowhead (probably early Neolithic), and the single-piece sickle fragment which probably indicates a later Neolithic date: the scrapers are also of forms which would not be out of place in such contexts.

Beechwood Farm, Market Weighton (SE 865 414)

A preparation flake of grey flint with a thick cortex, plain striking platform, and feathered distal termination. Edges slightly chipped (? damage). 61 x 25 x 14mm.

Chapel Farm (SE 793 341)

Blade of yellow (stained) flint, with a narrow striking platform and retouched end. 32 x 15 x 4mm.

Hotham Common

A core was found at this location in November 1994. It is of light brown-grey flint with a chalky cortex. It is an irregular single-platform type and may have been abandoned because of a flaw in the flint.

Welham Bridge

Two flakes and a blade were recovered from this site (ref. 305.1985). One of the flakes is of reddish-brown translucent flint, with uni-directional scarring and cortex on its back, and a plain butt, measuring 30 x 21 x 5mm. The other is of mid brown flint, also with a small patch of cortex. The butt end is shattered. It measures 32 x 38 x 10mm. The blade is the butt fragment of a regular prismatic blade, with a punctiform butt, and diffuse bulb of percussion.

Yokefleet Grange

Two blades and a flake, all of pale grey flint were found in this location. The complete blade measures 63 x 26 x 5mm, and the flake 33 x 36 x14mm. The flake has a battered area on the dorsal surface, and may have been struck from a hammerstone.

Warren Hill Farm (WHF 12/94)

Some 22 pieces were collected during a gridded survey of this site in 1994. The raw material is mostly light grey, and some white flint. It is rather chipped, suggesting post-depositional damage. The artefacts have been classified as follows:

Cores	1 frag. and 1 burnt piece, possibly a core.
Flakes	13 (4 with retouch)
Blade-like flakes	4 (2 with retouch)
Chips	3

The cores are unclassifiable. Amongst the flakes there is a possible preparation flake, which has cortex over almost all the dorsal surface, a flake which has overshot the end of the core (*outre passé* termination), and a possible core-trimming element. Where butts are present, they are plain.

Although some of the flakes and blades had retouched edges, there is nothing diagnostic in the collection.

South Cave

Thirteen artefacts collected at various locations in South Cave may be described as follows:

	Flakes	*Blades*	*Chips*	*Scrapers*
South Cave	1	-		4
Prairie Farm Gardens (SE 4905 4297)	5	-	2	1
Prairie Farm	1	-	-	-
Carrdales (SE 4908 4298)	-	-	-	1
Willow Flats (SE 4918 43025)	-	1	-	-
Marker Place Field (SE 4923 4304)	-	1	-	-
Newbald (SE 4909 4361)	-	1	-	-

Removals

The flakes are small and unremarkable. The blades are all incomplete. Two are made on opaque whitish-grey flint, and the third is semi-translucent. All are damaged. The notch on the one from Willow Flats appears to be the result of plough damage. The blade from Market Place Field also has a slight lateral notch, and has been retouched along its edge.

The scrapers include one with retouch across its distal end, three with retouch on their distal ends, one or both sides, and one with retouch on the side.

a. Scraper: abrupt edge retouch across end and down both sides, forming a flattened contour, on a flake of light grey opaque flint with light mottling and blotches, faceted butt and diffuse bulb. Gingell and Harding 1981, class 1. Dimensions 25 x 26 x 7mm.

b. Scraper: semi-invasive, partly sub-parallel retouch around ends and sides of a flake, of grey flint (opaque) with blotches, and a wide plain butt and resolved bulb. Gingell and Harding 1981, class lb, 25 x 31 x 10mm.

c. Scraper. Fine, semi-invasive, sub-parallel flaking around distal end and right side (cortex on left) of a flake of whitish flint with softish cortex, slightly stained; plain butt, and resolved bulb; Gingell and Harding 1981, class lb. Dimensions 27 x 31 x 1.1mm.

d. Scraper: on side of trimming flake. The flake is of opaque light grey-white flint, with a small patch of thin hard cortex on its distal end. There is nibbling edge retouch, which becomes semi-invasive in parts along right margin of the flake, forming a rounded contour. The flake appears to have been struck on an anvil. There is a large keel on the dorsal face, formed by a relict margin; the force of the blow has caused a corresponding hollow on the ventral face at the distal end. There is a large flat bulbar scar at the butt end. The butt is dihedral, and the bulb shattered. Gingell and Harding 1981, class uncertain. 52 x 33 x 26mm.

e. Scraper; retouch, semi-invasive and at a fairly low angle across distal end of a flake, of orange-brown, semi-translucent flint with light mottling and thin hard cortex; a plain or possibly dihedral butt and a double bulb. Gingell and Harding 1981, class III 25 x 33 x 6mm. (Prairie Farm Garden).

Summary

Although there is nothing particularly diagnostic amongst this collection, the forms of the scrapers, like those at South Cliffe suggest a later Neolithic or early Bronze Age date.

Unprovenanced

Six artefacts from the area, but unprovenanced, (not illustrated) were contained in the former museum at Holme County Primary School. They are now in the possession of P. Halkon. The collection includes two transverse arrowheads, one of yellow-brown flint, which has been made on the distal end of a flake, by semi-invasive bifacial retouch. The other is a flake with invasive edge retouch.

Amongst the other pieces, there are three flakes, two with edge chipping, and a blade segment.

Discussion

The artefacts described above are testimony to the thoroughness of survey work over many years, as well as an indication of the level of prehistoric activity over the landscape. As many of the artefacts were chance finds, it is difficult to estimate the original size, make-up and density of the scatters. However, the analysis of the material recovered has enabled us to confirm the earlier reports, and, to a limited extent, to observe the usage of different raw materials, and through a consideration of the technological stages present, the range and style of the retouched pieces, the type and the date of activity. This information, together with the environmental and monumental data, allow some conclusions to be drawn about the changing use of the landscape in the post-glacial period (see section I above). Ultimately, this will of course have to be tested by excavation.

Two types of flint appear to have been used for tool manufacture, the separation being made on the basis of colour, translucency and cortex type (Henson 1985; 1989. Manby 1979, 71; 1988, 42). There is a creamy-white opaque flint with a thick cortex, which seems to be typical of Wolds flint, and presumably was obtained from the Wolds to the east of the Survey area. The other flint shows a great variety of colour, from grey to black, and from brown to red; it is semi-translucent, and often has a thin cortex. This is probably till flint.

Flint also occurs in the gravels at South Cliffe, and was probably also exploited. The small numbers involved in the present study did not permit a quantitative study of the different use of raw materials, but we may note the use of Wolds flint for earlier Mesolithic assemblages (Jacobi 1978, 304; Radley and Mellars 1964: Myers 1989, 144), and that Wolds flint is often not of good flaking quality, and it is noticeable that till flint seems to have been preferred for axe manufacture (Manby 1979, 71).

The assemblages themselves are made up of different technological categories (Peterson 1990):

a) those with a repertoire usually associated with core reduction and tool production (i.e. with cores, removals and retouched pieces)
b) those with removals (without cores), and some retouched pieces
c) those with un-retouched removals
d) those with retouched pieces only.

Of course, to a certain extent, the range and amount of types recovered will depend on not only the original assemblage, but also the following:

- the intensity of searching
- the collectors' sensitivity to lithics
- the conditions pertaining at any one time
- the nature and type of the soil and taphonomic processes
- the way in which the material became deposited in the first place (see for example Healy's comparison of earlier and later Neolithic assemblages represented in surface assemblages at Tattershall Thorpe (Healy 1983 and 1987).

Various studies have estimated the amount of artefacts that might be visible on the surface of a ploughed field at any one time, and how much might be held in the plough zone as a whole (Schofield 1991a and b, and 1995; Boismier 1991; Haselgrove and Healey 1992) might thus enable calculations to be made concerning what proportion of the total assemblage the amount collected represents. Detailed calculations of this sort may not be appropriate here.

The original make-up of archaeological assemblages also varies, depending on their purpose. Procurement and primary processing sites would be expected to have a high proportion of debitage compared to tools (for example Flamborough Head: Henson 1989, 11f). Task-specific sites have a different repertoire from base camps etc. (Jacobi 1978; Myers 1989) and specialist sites (Pierpoint 1980; Durden 1995). How far it is safe to extrapolate this sort of information, and apply it to surface collections such as those discussed in this report, is perhaps a moot point; nevertheless, in the absence of other data, it does provide a peg on which to hang the data. On this basis, it seems reasonable to suggest that full activity was carried out at

Howe Hill Everingham, Howe Hill Holme on Spalding Moor, East Bursea Farm, Hasholme Hills, and Townend, North Cliffe. The large number of retouched forms at Pot Field probably represents similar activity. The large number of scrapers from South Cliffe may be significant, but is probably attributable to the collection method.

The dating of surface collections depends heavily on the presence of diagnostic types, and to a lesser extent on technological methods of core-reduction employed. The conclusions reached here are inevitably tentative, especially as it is not possible to date all the forms. Mesolithic activity is indicated by the presence of microliths at Howe Hill Everingham, and Howe Hill Holme on Spalding Moor, and the blade technologies at Hasholme Grange, East Bursea Farm, and Bursea House – though not conclusive – may point to Mesolithic technologies at these locations.

Neolithic activity in Eastern Yorkshire has been conveniently summarised by Manby (1988). This particular survey produced little evidence for earlier Neolithic activity, perhaps because of the nature of Neolithic sites (Healy 1987), although the sickle fragment belongs in such a context (Healy 1982). Later Neolithic and early Bronze Age activity was, however, noted at Pot Field, with the barbed-and-tanged arrowhead and the knives, where Beaker sherds were also recovered in 1970. It is also difficult to see the rounded scrapers with semi-invasive retouch as anything other than later Neolithic (Manby 1988, 73), and those from South Cliffe and South Cave should be included here. The more obvious presence of later Neolithic material in surface collections need not necessarily be surprising, as later assemblages tend to be larger than earlier ones, and to be more visible in the plough zone (Healy 1983; 1987).

All in all, the lithic material does provide evidence of continuing activity across the landscape throughout the Mesolithic and Neolithic periods, and into the Bronze Age. The present distribution, which seems to reflect environmental changes at different periods, suggests that there is considerable potential for further investigation.

Chipped stone artefacts from excavations at Hawling Road, Market Weighton (Fig. 21).
by A.J. Schofield
Evidence for low-level activity from the later 3rd millennium BC came from the work on the Market Weighton by-pass (Creighton 1999). During field-walking a barbed-and-tanged arrowhead was found at Skelfry Park Farm (SE 863 424), and a Neolithic scraper at SE 890 417. Further flints were found during line-walking, gridded survey and excavation at Hawling Road (see Table 5). In all, 56 chipped stone artefacts were found. They are described as follows:

Group 1: preliminary line-walking (Fig. 21, top row)
20 artefacts were recovered, of which a relatively high proportion comprised dressing chips and shatter, while retouched artefacts and core-trimming flakes occurred with less frequency than elsewhere. Three of these are illustrated:

1. Broken portion of a core-trimming flake, with a retouch at the proximal and distal ends. Light grey translucent flint. 31 x 19 x 4mm, weighing 6g (SF 500).
2. Core-trimming flake, in fresh condition, though with some recent edge damage. Dark grey/black translucent with a small patch of brown sandy cortex. 36 x 21 x 7mm, weighing 7g (SF 509).

Table 9: Flint from the Hawling Road Excavation. (ordered by area).

Area	SF No	*Description*	*Total*
210-220E	201, 219	chips/shatter	2
220-230 E	236	chips/shatter	1
230-240 E	202	tertiary flake	1
240-250 E	67, 174,175	tertiary flakes	3
260-270 E	262	tertiary flake	1
270-280 E	228, 229	chips/shatter	
	151	thumb-nail scraper	
	230	core-trimming flake	4
280-290 E	263	leaf arrowhead	1
300-310 E	225,226,227,232	chips/shatter	
	221, 222	core trimming flakes	
	220, 223	tertiary flakes	8
310-320E	264	leaf arrowhead	
	234	tertiary flake	2
350-360E	215	secondary flakes	1
360-370E	159, 203	tertiary flakes	
			2
370-380E	233	core	1
			27

3. Broken portion of a core-trimming flake in fresh condition. Dark grey translucent flint (cf. SF 500), also with a small area of sandy cortex. 32 x 21 x 3mm, weighing 2g (SF 665).

Group 2: gridded survey (Fig. 21, second row)
Nine artefacts were recovered by surface collection in the area which produced most Roman pottery. Interestingly, no more than single artefacts were recovered from any one grid square, whilst most of the artefacts came from the north and east of the site. Six of the artefacts were retouched, including a transverse arrowhead characteristic of later Neolithic assemblages. The collection also differed from that described above in that it produced only one chip and three tertiary flakes – the higher proportion of the collection comprising core-trimming flakes, as secondary flakes and a core. The higher mean weight of the artefacts from this group has no significance, as it results from the single core, which had a weight of 32g. The illustrated artefacts are described as follows:

1. Secondary flakes of blade proportions, with distal retouch. The flake is in fresh condition, of similar raw material to nos 2 and 3 above. Again, it has edge damage along either side. 44 x 18 x 2mm (SF 501, grid square B11).
2. Incomplete tertiary flake with distal retouch, probably having functioned as an end scraper. Section of distal end broken in antiquity. Patinated flint, now light grey. 36 x 16 x 2mm. Weight 3g (SF 505, grid square F3).
3. Distal segment of a broken core-trimming flake, later retouched along one side. Dark grey flint, with light patination. 24 x 20 x 1mm (SF 503: grid square J6).
4. Un-retouched tertiary flake of blade proportions. Flint, now patinated and light blue/grey in colour. Small patches of sandy cortex towards distal end. 34 x 15 x 1mm. 2g (SF 504, grid square O9).

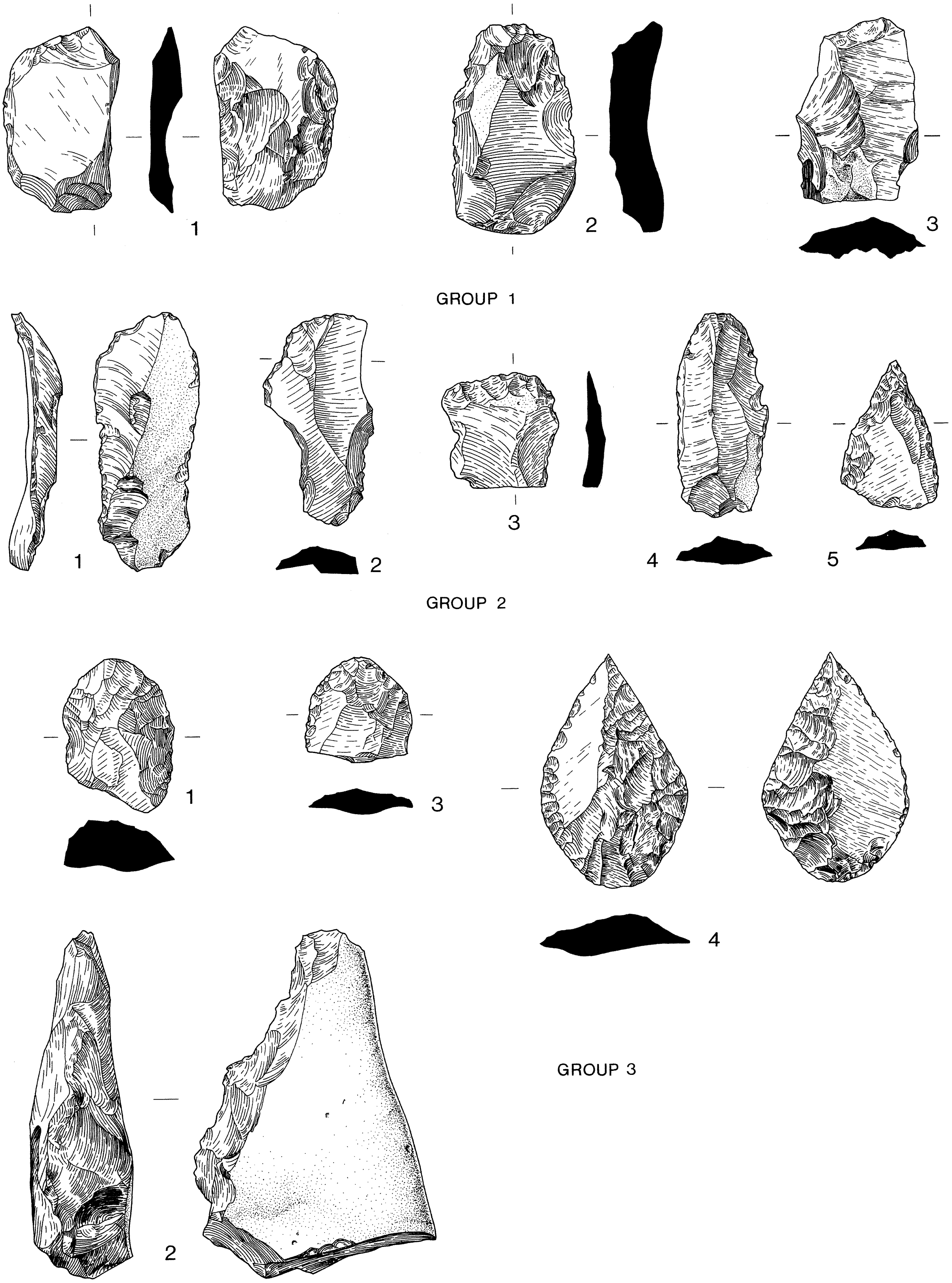

Figure 21 Chipped stone artifacts from Hawling Road, Market Weighton; Groups 1-3. Scale 1:2

5. A transverse arrowhead of British oblique type (Green 1984, 26). The secondary flaked edge is of characteristic convex outline, although the convex base is uncharacteristic. Date: 2500 – 2000 BC. Light grey cloudy white translucent flint. 24 x 16 x 1mm. (SF 507, grid square L7).

Group 3: excavation (Fig. 21, third and fourth rows)
27 artefacts. The collection is relatively balanced, though its composition appears broadly similar to that from extensive surface collection – 70% of the artefacts comprising either tertiary flakes or chips. The distribution is of interest, as there is a tendency towards clustering – most of the finds occurring in two areas between 270-280E (4 artefacts) and 300-310E (8 artefacts).

Also of interest is the fact that two of the diagnostic artefacts in this group, both earlier Neolithic leaf-shaped arrowheads, occurred outside these clusters. No flint artefacts were recovered from these areas during the preliminary gridded surface collection. The illustrated artefacts are described as follows:

1. Core-trimming flake, later modified to form a thumbnail-type scraper, generally thought to be characteristic of Beaker assemblages. Light grey flint, patinated, with retouch appearing on all but the proximal end. 25 x 20 x 8mm (SF151; location 275E 386N).
2. Core struck from a narrow piece of nodular flint, derived most likely from a gravel source – possibly local, in view of the apparently reckless approach taken to its reduction. Dark grey flint with dark brown/grey cortex. 33g 52 x 36 x 15mm (SF 264; 370E 400N). Stratified with a good late Iron Age ceramic Group.
3. Proximal end of a leaf-shaped arrowhead, probably of type 2A (after Green 1984, 24), generally thought to date between 3500 and 1500BC. It is of dark grey flint with some small patches of light patination. 1g: 20 x 20 x 40mm [SF264; location 370E 400N].
4. Perfect and complete example of a type 2A leaf-shaped arrowhead. It is fresh (unlike no. 3, above) of dark brown flint and with no patination. It is not thought to have been made locally, as no other flint of this type or workmanship of this class is evident in this collection. 3g: 40 x 26 x 4mm [SF 263], location 281E 400N].

Summary

The chipped stone artefacts appear in a dispersed distribution, with the exception of two small clusters identified within the excavated area. The smaller of these, however, is the only one to have produced any evidence for habitation, though only in the form of a thumbnail scraper. There is no evidence for primary reduction of lithic raw materials. Cores have been located, as well as a large proportion of chips and tertiary waste. The suggestion is that the artefacts were being curated rather than manufactured on site, with occasional poor quality nodules found locally, providing a top-up to the imported assemblages when required. The date ranges for transverse and leaf-shaped arrowheads overlap for the period 2500-2000 BC, whilst the occurrence of a thumbnail-type scraper confirms the presence of communities towards the latter end of the range.

Flint and stone axes and adzes from the survey area
(Figs 22-3, and Pls 4-5; Table 10)
by T.G. Manby

The blade forms have been classified according to the author's material-related typological scheme for Yorkshire flint and stone axe material (Manby 1979, 65-9, figs 1 and 2). The implement petrological classification utilized is that of the regional stone axe survey of the CBA Implement Petrology scheme (Phillips *et al.* 1988). The following qualifications have also been used:

Heavy axe blades: Particularly those over 150-200mm in length, suitable for tree felling and timber splitting

Light axe blades: suitable for brashing and foraging, also for carpentry work.

Adzes: Asymmetrical section for hafting at right-angles to the shaft. A slightly curving longitudinal profile is a feature of some of the quality blades, particularly those of flint, such as the Hasholme example F4 (Fig. 22 and Pl. 5).

Re-working: The sharpening and re-shaping of large blades by flaking and grinding, after damage to cutting edges, or after breakage by splitting or snapping during usage. The heavy axes may be reduced to light axes by this process, but still retain their original width.

Flint axes and adzes (Fig. 22; Pl. 5)

F1. Holme-on-Spalding Moor, Leylandii (Fig. 22)

Heavy axe blade, Class B2. 171mm long: 70mm across the cutting edge. Dirty-cream to grey patinated surfaces. Asymmetric, pointed oval section, with rounded butt. Intensively ground surfaces, leaving some shallow flake scars along the sides. The side edges and butt have been smoothed over during grinding. Some iron staining on the faces, including dendritic root-marks. Weathering has dissolved chalk inclusions in the ground surface, and has left many small cavities, along with the larger craters that retain some residual chalk.

Macro: Flint, very dense, creamy, with white and fawn mottling, and deep pockets of chalk skin in the surface. Probably Wold flint.

Comments: A heavy blade, the cutting edge shows no damage by use. This flint axe class, as a finished blade type is scarce across Yorkshire, where it reaches the northern extent of its distribution. It is more numerous in Lincolnshire and the Trent Basin, as both flaked and finished axes, as East Midlands Class 5 (Moore 1979, 86); a flatter section distinguishes them from the rounder Class 4. The distribution continues southwards into Northamptonshire, the Fenlands and into East Anglia, where they are most numerous, making up cluster 4 of Michael Pitts' axe morphological grouping (Pitts 1996, 342, fig 13) of stone and flint axe blades:

Lincolnshire:
Barkston (Grantham Mus.)
Barlings (Linc. Mus. 31.52)
Coningsby (Linc. Mus. rec)
Kirmington (H. Mus) Flaked.
Stanton-on-the-Wolds (Nott C.M. rec.)
Leasingham (Linc. Mus. rec)
Morton (Linc. Mus.13.53)
Riby (Scunth. Mus) Flaked
Swarby (Linc. Mus. 77.74)
Snitterby Carrs (Linc. Mus. rec)
Tumby (Linc. Mus. rec)
Welton-le-Marsh (Linc. Mus. 8.48)

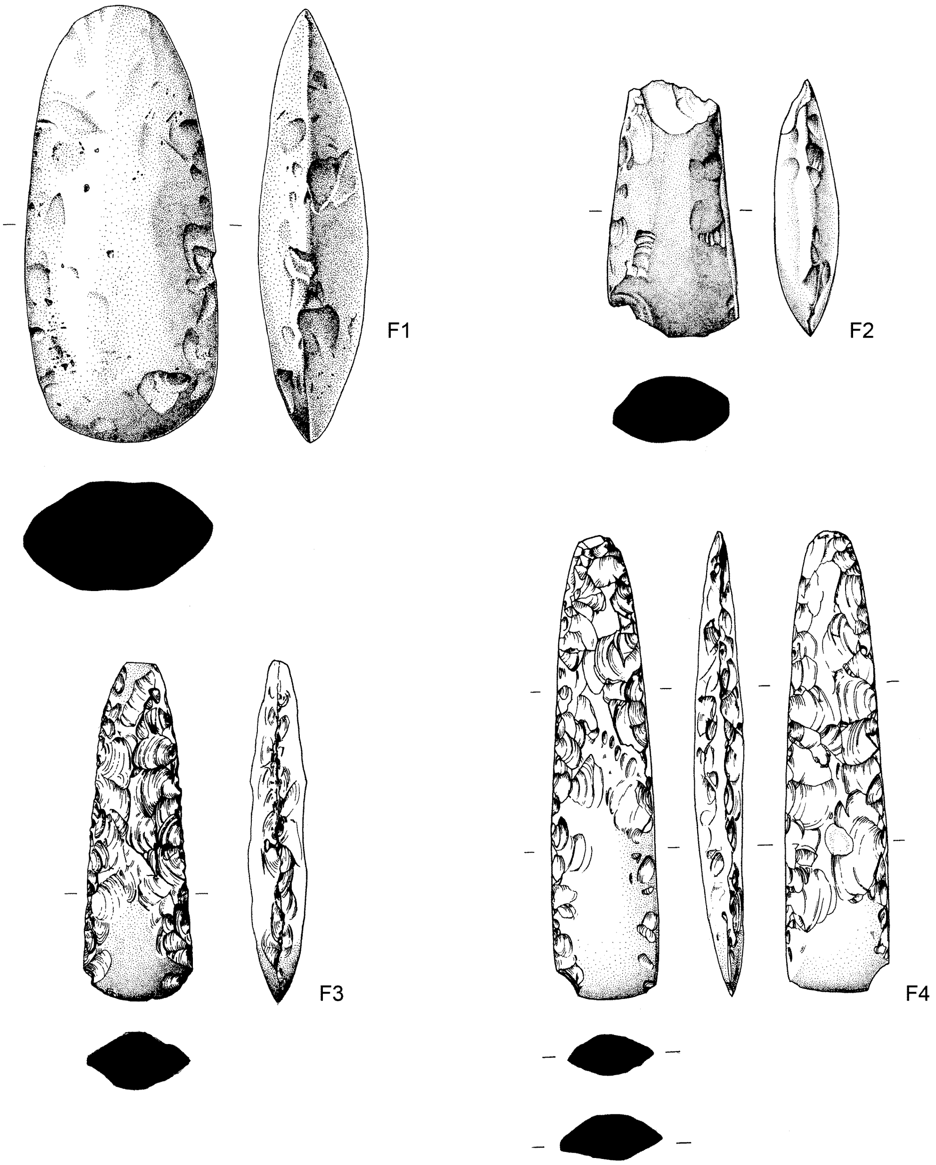

Figure 22 Flint axes and adzes F1-F4. Scale 1:3

Nottinghamshire
Finningley (Donc. Mus. 436.72). Partly ground
Harby (BM (Sturge). Flaked
Long Bennington
Stathern (Nott. C.Mus 92.38). Flaked

Yorkshire
Knaresborough (Hull Mus.)
Whitby (YM 434.1948)
Walkley, Sheffield (Shef.M.X1978.174)
Holme-on-Spalding Moor (present study)

F2. Holme-on-Spalding Moor, Hasholme Grange (Fig. 22)
Light axe blade, Class B2b. 102mm long, 53mm across cutting edge. It has been stained bright orange with paler patches, and is oval in section, with well-rounded sides. Shallow flake scars remain on the faces along the sides after rubbing down. On one face this was done in four longitudinal facets. The cutting edge has been coarsely re-ground after the removal of some shallow flaking. Recent impact flaking has removed the butt, and one corner of the cutting edge.
Macro: Flint, opaque mottled grey. Probably glacial material.
Comments: Amongst the run of ground flint axe finds, this form is notably less numerous across Yorkshire, where the flat side-faceted Class B2a is the commonest type.

F3. Bunny Hill, North Cliffe (Fig. 22)
Light axe blade, Class D3. 133mm long, 40mm across cutting edge.
Stained bright orange, with some paler patches. Elliptical in section, with a profile tapering towards butt, that has a facet improved by grinding. Shallow flake scars remain on the faces, the edges showing intense battering. Smoothly ground at the cutting edge, with patches of grinding on ridges along the spine and at the butt. Recent impact chipping affects the cutting edge in two places.

Macro: Flint, dense mottled grey. Wold Flint.
Comments. This is a good example of a late Neolithic light axe blade, represented by a number of surface finds from Eastern Yorkshire. The type is present in the York Hoard, at Bridlington

with a skull burial, and at Liff's Low, Derbyshire, in a cist burial. A longer axe of this type has been found at Greenbrae, near Cruden on the Aberdeenshire coast, associated with jet and amber collared beads, but without a recorded burial. These associations enable the light edge-ground class to be assigned to the regional later Neolithic 1 (Duggleby) Period 3000-2750 BC (Manby 1988).

F4. Holme-on-Spalding Moor, Hasholme Carr Farm (Fig. 22; Pl. 5)
Adze blade, Class D7. 182mm long, 40mm across cutting edge.
Lightly patinated, mottled grey and orange-brown flint. Slightly asymmetrical profile and pointed oval section, slender rounded butt. Flaking is shallow. All edges have been ground down along the sides and butt. The cutting edge and back along the spine of each face have been finely ground to a polished glassy finish. One corner of the cutting edge has been broken off in antiquity, the other corner has a recent snip.
Macro: Opaque mottled brown flint with some lighter speckling, a deep patch of chalky skin remains on the ventral face. Glacial flint material.
Comments: A very fine and rare piece of flint craftsmanship. Distinguished by:
a. the proportions of length and thinness.
b. the slight curving profile, which is very difficult to produce on such a slender profile.
c. the grinding down to a smooth outline of the sides and butt.
d. the glassy finish from the cutting edge back along the spine, is a true polished finish.

This is a refinement of the basic later Neolithic Class 3D axe type, that tapers towards the butt, with a finish applied to the cutting edge zone. The application of grinding around the edges is a development of unique character. The quality of workmanship relates this adze from Hasholme to the exotic, specialized, broad-butted 'Duggleby' adzes and 'Seamer' axes (Manby 1974, 98-100); however, its squarish cutting edge contrasts with the bold semi-circular cutting edges that are such a feature of the Duggleby and Seamer types. The delicate nature of the Hasholme example and its fine finish require this adze to be placed within the prestigious class of later Neolithic flint working.

Comparisons:
Seamer Moor: accompanying a Seamer-type axe and chisel, in a secondary deposit of prestigious items, that had been inserted into an earlier Neolithic barrow. Adze: 134mm long (BM. 79.12-9.1954: Kinnes and Longworth 1985, 147, no.7).

Liffs Low, Biggin, Derbyshire: The larger of two edge-polished flint axes, accompanying an inhumation in a cist with an edge-polished flake knife, an antler macehead, and a miniature Peterborough Ware pot. Axe: 190mm long (Sheffield City Mus. J93-55).

These two associations serve to place the implement type firmly in late Neolithic I (Duggleby horizon) *c.* 3000 – 2750 BC (Manby 1988, 59-62). Particularly close parallels to the Hasholme adze are from:

(a) Cranswick Carrs, which despite its being an axe, is remarkably similar to the Hasholme blade, having an identical elongated outline and a fine finish applied to its cutting edge. The proportions are similar, except it is longer, at 227mm (Hull Mus.)
(b) Ripon: an adze which is a close parallel in outline, but the faces are finished by more extensive grinding extending towards the butt. 188mm long (Sheffield City Mus.)

Stone axes and adzes (Fig. 23; Pl. 4)
S1. Seaton Old Hall (Fig. 23).
Light axe blade, Class B2c. 110mm long, 50mm across the cutting edge
Fine-grained stone with a greenish-brown patinated surfaces, one paler than the other. Pointed oval section, with the butt ground down to a facet. Surfaces intensively ground to remove most of the flaking scars. The sides towards the butt have been blunted by pecking, so that it would fit inside the haft. The mark of the haft is visible across the paler patinated face, and indicated by darker tone. There is recent damage along its cutting edge, including a small flake broken off one face. It has been damaged by recent chipping
Macro: Tuff, dark green fresh rock. (Group VI: Lake District)
Comments: It is notable, due to traces of the haft being indicated by the darker tone of the patination on one face, and the battering of the sides.

Class B2c axes are characterized by the rubbed-down facet at the butt. It is not a common type in Yorkshire, Lincolnshire and the Trent Basin, but a distinctive type in Group VI rock. Late Neolithic associations are represented by a butt fragment associated with Durrington Walls-style Grooved Ware at the North Carnaby Temple Site (Manby 1974, 62, fig. 26.2; 1979). There is a cluster of six finds of Class B2c axes from the lowlands west of the Wolds from:

Seaton Old Hall (this paper S1).
South Cliffe (this paper S6).
North Cliffe (Yorks. Mus. 1972.10)
Houghton, Castle Farm (Yorks. Mus. 295.1948). Perforated.
Hayton, Grove Farm (Yorks. Mus. YM 1972.11)
Millington, Ousethorpe (private). Perforated

The two axes that have a small hour-glass perforation at the butt-end belong to a small series, that includes some jadeite examples, which have possibly been utilized as personal ornaments (Bradley and Edmonds 1993, 189, fig. 9.4.)

S2. Holme-on-Spalding Moor, Rose Villa (Fig. 23)
Axe blade, Class B2a. 102mm long, 509mm across cutting edge.
Greenish-grey patinated surfaces. With broad side facets, it tapers to a thin butt, squared by later flaking, after intensive grinding had removed all but the deepest flake scar. This is the re-worked butt of a large 'Cumbrian' type; the widest part turned to a new cutting edge ground at acute angles. Subsequently, a large flake was taken off one face, and small flakes and chipping off the other.
Macro: Tuff, probably Group VI: Lake District.
Comments: The reworked butt of a large heavy blade converted to a light axe, originally of 'Cumbrian' type. There is a complete example from Holme-on-Spalding Moor (BM. Sturge Coll.). This type product, exported from the Lake District production areas is always in Group VI and related tuffs; the complete axes are scarce in Eastern Yorkshire in contrast to many re-worked and fragmentary blades (Manby 1965, 1979; Bradley and Edmonds 1993).

S3. Hasholme Hall (Fig. 23)
Axe blade, Class B2. 153mm long, 73mm across cutting edge.
Dark greenish-grey patination. Pointed oval section, with many deep flaking scars remaining, after the spine and edges had been roughly rubbed down. Intensive grinding to lower part of blade to form cutting edge. Surfaces have some recent scouring by metal implements.
Macro: Dark greenish (probably Group VII: North Wales).

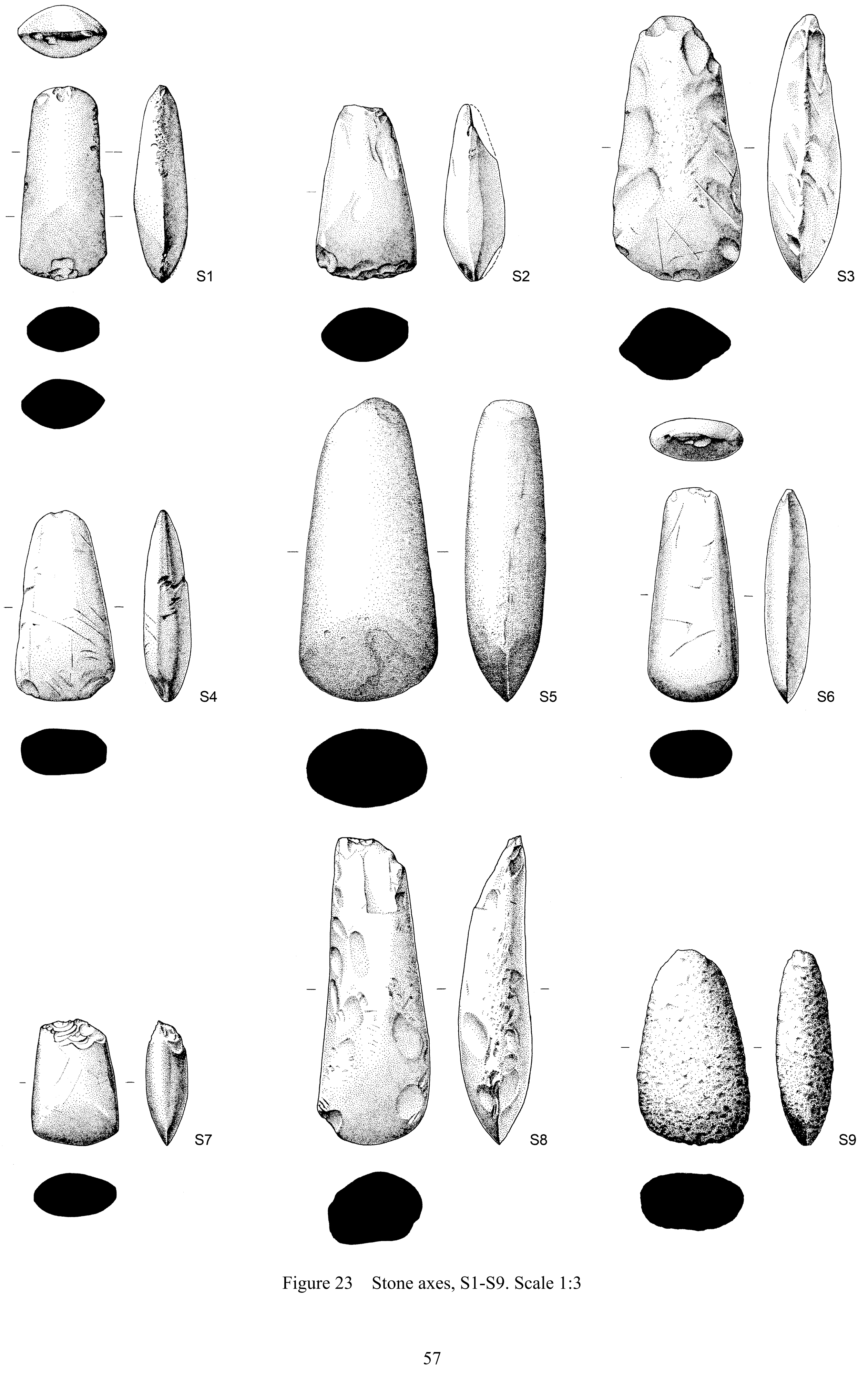

Figure 23 Stone axes, S1-S9. Scale 1:3

Table 10 Axes in Holme Survey area (see Section 1.3 Table3)

Group	Total	% of total tools	% of stone tools identified
VI	10	44.8	76.9
VII	2	6.9	7.7
XV111	2	6.9	7.7
Flint	11	37.9	
Fairhurst (1986)	490 (Total ID 279)		
VI		38.7	68
VII		4.9	8.6
XVIII		8.36	14.7
1		3.9	6.8
RADLEY (1974)	222		
Flint	41	18.46	
Stone	181	81.5	

Comments: A heavy axe blade likely to be Group VII; one of a number from this North Wales source found in the Vale of York. Many flake scars are left by an economy in grinding that concentrated on the cutting edge, sides and spines.

S4. Holme-on-Spalding Moor, Hasholme Grange (Fig. 23)
Light axe blade, Class B2a. 110mm long, 57mm across cutting edge.
Deeply weathered, buff-toned surfaces. Flattish in section, with wide side facets. The butt of a large axe with a new cutting edge ground on. The actual cutting edge is blunt. Many recent implements have scoured its surface.
Macro: Deep weathering has altered the surface of the rock to a fine sandy finish, similar in appearance to that on some Group VI axes.
Comments: A light axe reworked, this flat-sided Class B2b type is the most common form of axe in Yorkshire with earlier Neolithic associations. There is a fragment of a similar-sized axe from Bursea (HM).

S5. Holme-on-Spalding Moor, Hasholme Carr Farm (Fig. 23; Pl. 4)
Heavy axe blade, Class C5. 172mm long, 81mm across cutting edge.
Unpatinated, speckled green and white. A rounded oval section with a partially rounded butt. Most of the pecked surface has been removed by grinding. One face in particular has a very smooth finish. There is a patch of fresh abrasion near the cutting edge. It is unweathered, but has some iron dendritic root-marks on one face.
Macro: Dolerite (probably Group XVIII: Whinsill).
Comments: A very well-finished axe of dolerite, a material available in the glacial drift of the East Yorkshire coast. The unweathered and bright condition is unusual, and the nature of its host deposit needs to be established.

S6. South Cliffe (Fig. 23)
Light axe blade, Class B2c: 123mm long, 52mm across cutting edge.
Fine-grained, brownish stone, elliptical in section with a butt ground to a facet. Intensive grinding has removed all trace of flaking, except for three small scars at the butt. There is slight evidence of weathering, some iron dendritic root-marks and recent shallow (implement) scouring.
Macro: Dark green tuff (likely to be Group VI: Lake District).
Comments: Belongs to the same butt-faceted type as S1.

S7. South Cliffe (Fig. 23)
Light axe blade, Class B2a: 71mm long, 51mm across cutting edge.
Finely ground, fine-grained stone, with a faceted side and a re-flaked butt. The reuse of the blade is indicated by variations of surface patination, buff over iron-rich brown, overlaid by dendritic root-marks. The butt has been reworked by shallow flaking before the patination developed, but the cutting edge was reground after the formation of the buff patina, which has been caused by weathering.
Macro: Dark green tuff, likely to be Group VI: Lake District.
Comments: A light axe showing evidence of reworking.

S8. South Cliffe (Fig. 23)
Adze blade, Class B7: 177mm long, 62mm across cutting edge.
Fine-grained, greyish-green stone with no patination. A thick ovoid section, with a broad but thin butt left by flaking. Deep flake scars have been left after fine grinding, and battering scars down the sides. A large area of the ventral face is an unworked cleavage surface from the initial working of the rock. This gives the section a twisted profile. Unweathered, with some darkish staining especially from cutting edge back along the dorsal face, which is stained with many iron-rich dendritic root-marks. A recent impact has broken off one corner of the cutting edge, exposing fresh dark rock.
Macro: Ashy material with feldspar inclusions: probably Augite-Granophyte, likely to be Group VII: North Wales.
Comments: A second axe likely to be Group VII. There is an even greater economy of grinding in comparison with other axes of this rock. The shape is created by the adaptation of a thick-sectioned,

naturally cleaved rock fragment. The thickness would have made hafting difficult.

S9. Harswell (Fig. 23)
Heavy axe blade, Class C5: 155mm long, 60mm across cutting edge.
Made of coarse igneous rock with large inclusions and small voids. A grey-green patinated surface, with small patches of iron staining. Deeply weathered, rough surfaces, with hollows caused by the dissolution of minerals, including iron. It tapers towards the butt and has a fat oval section.

Macro. ? No fresh rock visible. Identification would require a core to be taken.
Comments: The surfaces of this axe have been eroded by exceptional soil conditions over a long period before its recovery.

General commentary on axes examined

The sample contains the majority of axe classes and materials usual in Yorkshire; however, there is a notable absence of blades of Cornish origin (Group I). Heavy felling axes are present with some lighter wood-working types. Distinct from these common functional axes is the outstanding example of a prestigious piece of specialized later Neolithic flint craftsmanship, from Hasholme Carr Farm.

As all the axe blades are casual surface finds, the only dating method available is cross-comparisons with others from associations considered above. However, the variety of shapes and materials from which the tools have been made, based on these regional comparisons, would indicate that the flint and stone axes are the product of local activities across the full extent of the Neolithic period. The above sample is too small for detailed statistical conclusions, but by using all recorded finds from the surrounding area of the Vale of York, between the Wolds and the Derwent, it is possible to draw some conclusions which are set out in Table 10

A stone axe-hammer from Lock Farm (Fig. 24) by T.G. Manby

This object (Fig. 24) was found at Lock Farm, Holme-on-Spalding Moor, by Mr T. Sergison, attached to the tine of his harrows during the cultivation of a field at SE 8455 3930. The find-spot is of interest for it lies close to a relict stream bed of the River Foulness.

Length: 226mm. Width of cutting edge 67mm.; width of butt 60mm.; diameter of perforation: 35 x 38mm. Weight 2890g.
Class Ia: Broad flattened butt, slightly oval shaft-hole drilled from each face producing a moderate hourglass perforation. No signs of grinding within the perforation. A slight hollowing of the faces above and below the perforation.
Condition: Complete, scratches and small abraded patches caused by recent impacts, especially affecting one side.
Material: Coarse-grained igneous rock, dark grey-green rock shows in abrasion patches.
Macro: Individual minerals not certainly identifiable in the abrasions and in the weathered surface. Possibly a dolerite; petrological determination is necessary.

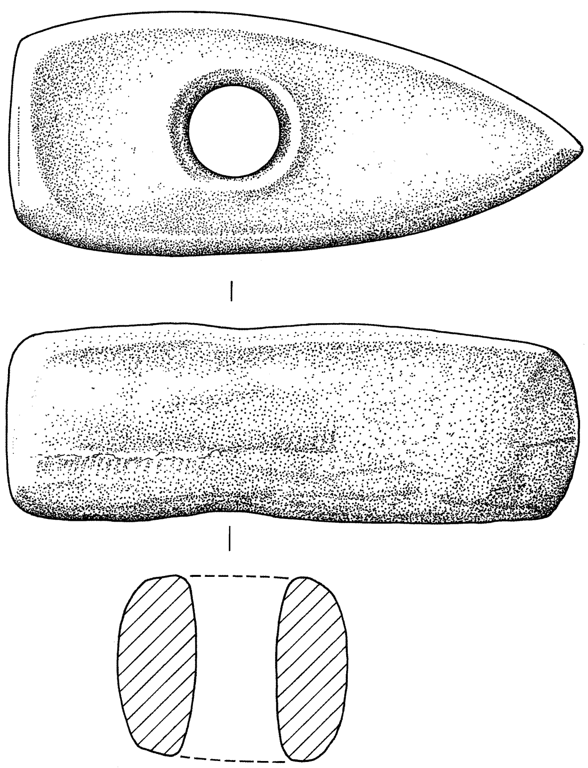

Figure 24 Stone axe-hammer from Lock Farm. Scale 1:3

Surface: Rough and harsh surface with orange-brown ferruginous staining with darker toning. No evidence of pecking, a slight wavy ridge extending down one side suggests the original finished surface has been corroded by soil condition, leaving this vein of harder mineral standing proud.
Date: Early Bronze Age. Axe-hammers have not been found in closed associations, and this class can only be assigned a general date range of 2000-1800 BC by comparison with Roe's Woodhenge battleaxe stage, butt type C (Roe 1966, 205-7), that have Late Beaker burial associations.
Comments:
Axe-hammers have been classified by Fiona Roe into two classes based on profile character that is only broadly comparable to the complex development classification of the smaller and well-finished stone battleaxe series (Roe 1979, 26-31). As a type they are particularly numerous in the north-western counties of England and south-western Scotland.

Petrologically, axe-hammers were produced in a range of compact coarse rock, igneous, metamorphic, and some sandstones. Physically a rock type with a structure to withstand the friction-grinding perforation method that was used for shaft-hole implements.

In excess of one hundred axe-hammers are known from Yorkshire, their distribution concentrated along the North Sea coastland, but widely scattered across the Vale of York (Roe 1979, fig. 5). Of 56 petrologically determined axe-hammers, 24 were in Group XVIII – Whinsill (Phillips *et al.* 1988, 53) – a rock regionally available as Devensian erratics along the coast, and as outcrop exposures in Teesdale.

All recorded Yorkshire axe-hammers have been surface finds exposed by recent cultivation. Excavated associations are few; unlike battleaxes, axe-hammers have not been recovered from the Wolds Early Bronze Age barrows. In the Pennines, at Milnrow, Lancashire, a squat version of a Class Ib axe-hammer (Group XV rock) accompanied an urned cremation (Coope, *et al.* 1988, 65, fig. 8, La 108); the pottery was discarded, and can only be circumstantially attributable to the Collared Urn series.

Probably intended for re-use as potboilers are three broken axe-hammers amongst utilised stone debris at the Holderness Barmston Site B (Varley 1968, 24). The site stratigraphy implies an association with the radiocarbon dates of (BM-122) 2960+150 BP and (BM-123) 2890+150 BP for an occupation-episode in wetland conditions. The dates provide a *terminus ante quem* for the use of axe-hammers, but their wide standard divergences calibrate to only a broad later 2nd millenium BC range.

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