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MESOLITHIC ACTIVITY AND EARLY NEOLITHIC EARTHWORKS AT 41–42 KEW BRIDGE ROAD, HOUNSLOW

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SUMMARY

Archaeological investigations at 41–42 Kew Bridge Road revealed evidence relating to the Mesolithic (c.9600–c.4100 BC), and Early Neolithic (c.4100–c.3400 BC) periods. The earliest activity is represented by the production and use of struck flint during the Mesolithic period which occurred adjacent to a small stream that flowed into the Thames. Close by were pits that may have been in use at the same time, which if so would represent rare evidence for the use of deliberately cut features during the Mesolithic. In the Early Neolithic a sequence of large ditches, some containing rich artefactual assemblages, were dug. The full extent and nature of these features could not be ascertained as they extended beyond the limits of excavation. Nevertheless, their considerable size suggests possible ceremonial or monumental activity and their artefactual assemblages represent significant additions to the understanding of the Neolithic within Greater London. Following their infilling, further prehistoric activity of a more domestic character was recorded; occupation was represented by small-scale pitting, plus scattered post- and stakeholes.

INTRODUCTION

Archaeological excavations at 41–42 Kew Bridge Road, Brentford in the London Borough of Hounslow, centred on NGR TQ 1877 7796, were commissioned by SLR Consulting and undertaken by Pre-Construct Archaeology Ltd during 2013–14 prior to the redevelopment of the site for residential units (Fig 1). Much of the site had undergone severe truncation during previous redevelopments, but in some areas deposits from the prehistoric, Roman and medieval periods had survived. This report

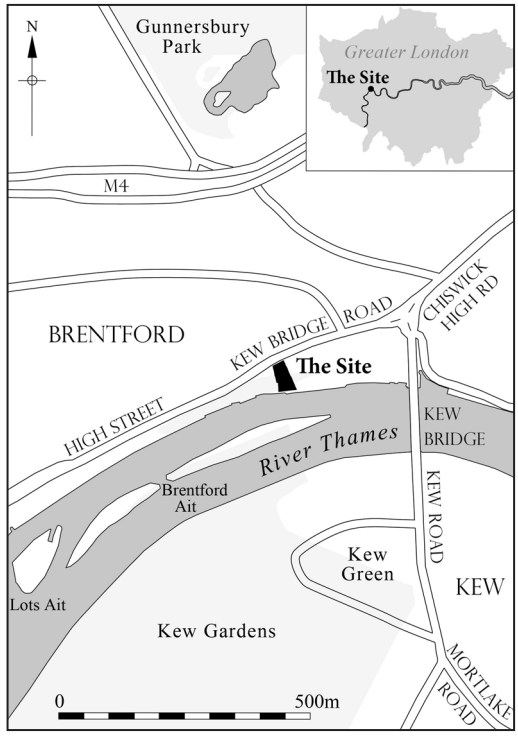


Fig 1. Site location (scale 1:15,000)

concentrates on the regionally significant evidence for prehistoric activity revealed at the site, in particular that relating to the Mesolithic and Early Neolithic periods. The archive will be deposited with London Archaeological Archive (LAA), under the site code KEB13.

Archaeological Context

Hounslow has been occupied since early times and boasts one of the richest archaeological resources seen in Greater London (Clegg 1992, 444–8). Particularly prolific have been objects dredged from the Thames in the vicinity of Kew Bridge (Lawrence 1929, 81). Mesolithic finds include two antler axes (one perforated) and a perforated adze made from a *Bos primigenius,* or aurochs, radius (Wymer 1977, 194). Two tranchet flint axes or 'Thames picks' have been dredged from the Thames at Brentford (Lacaille 1961, 130–1) with another six examples recovered from Kew (Field 1989, appendix 1, nos 75–80). Two complete Neolithic ground stone axeheads plus four complete ground or polished flint axeheads and one partial example from this locality exist in the British Museum's collection (Adkins & Jackson 1978, object nos 66, 120, 134, 224, 240, 273 and 359). Other objects probably of either Mesolithic or Neolithic date discovered in the Thames or on its foreshore around Kew Bridge include 'flint flakes, a scraper, a bone spear, a bone netting tool, a flint "fabricator" … [and] a flint pick' (Lawrence 1929, 81).

Complementing these finds, archaeological work along the north bank of the Thames in Brentford has revealed traces of prehistoric occupation. Flints and pottery dating to the Early Neolithic have been recovered from a pit at Kew Bridge House, *c.*250m to the east (Cooke & Phillpotts 2015), whilst at a similar distance to the west a large struck flint assemblage was recovered at the Brentford Gasworks site, representing sporadic activity from the Mesolithic through to the Bronze Age (Bishop 2000; 2002). Many other sites along the north bank of the Thames in the Brentford area have also produced evidence, mostly in the form of flint-work, which testifies to fairly intensive occupation occurring throughout the prehistoric period (*eg* Canham 1978a; Darton 2007; Macdonald 1976, 21; Parnum & Cotton 1983; Proctor & Moore 1996). Despite being low-lying and marshy, similar intensities of prehistoric activity are likely to have occurred on the south bank of the Thames at Kew although, due to the presence of the botanical gardens, this area has received much less archaeological attention.

In contrast to the ample evidence for what may be considered domestic occupation sites, there are few securely attested Neolithic and Bronze Age funerary or ceremonial sites known in central London, although numerous examples have been identified on both the east London and west London gravel terraces (*eg* Canham 1978b; Carew *et al* 2006; Chaffey *et al* 2013; Ford & Pine 2003; Hedges & Buckley 1978; Jones 2008; Framework Archaeology 2006; 2010; Powell *et al* 2015). This apparent absence in central London may also be a consequence of archaeological bias; large monumental features would not always be easy to identify in an urbanised landscape, where damage to archaeological deposits can be high and investigations are often limited in size.

The site is located immediately south of the main Roman road linking London (Londinium) with Silchester (Calleva Atrebatum), Margary's (1973) route 4a, which, in this area, may have had some form of Iron Age precursor, as an important settlement of this date is known extending along the river from where the road crosses the River Brent (Bishop 2002; Knight & Cotton 2016). The formal road appears to have been constructed early in the Roman period and it seems that the earlier settlement continued to develop alongside it (Canham 1978a; Parnum & Cotton 1983; Darton 2007). Recent work at the nearby Hilton Hotel in Syon Park has demonstrated that Roman occupation along the road was established in the immediate post-conquest period and lasted until the 5th century AD, with suggestions that Brentford formed a staging post along the route (Cowie *et al* 2013).

Little has been recorded from this area relating to the medieval period. The site is shown on historic maps to have remained as rough ground until the late 19th century, and subsequently to have been occupied by large industrial units first shown on the 1896 OS map on its southern part. On the

northern section, two semi-detached houses were constructed in the 1860s, which had been demolished prior to publication of the 1974 OS map. In the 1970s office buildings replaced the industrial units on the southern part of the site and a car park was constructed on the northern side (Malim 2012).

Geology and Topography

The site lies on the northern bank of the river Thames at the apex of the outer side of a meander and the southern side of the site adjoins the river (Fig 1). Locally, the landscape comprises a relatively flat river terrace, but within the vicinity of the site lateral erosion by the meander has caused ground level to slope steeply down to the river, from *c.*8m OD at the north of the site on Kew Bridge Road to *c.*0m OD at Mean Low Water on the Thames foreshore (Fig 2). In the prehistoric period the site would have occupied a relatively prominent riverine position with good views along and across the Thames. Some *c.*800m upstream of the site, the River Brent flows into the Thames.

The ground level of the site at the time of the archaeological intervention was flat as a result of levelling to create a car park during the late 20th century (top level between 7.60m to 7.70m OD). The natural topography sloped downwards from a highpoint in the north-eastern corner of the site to the south.

The British Geological Survey (2007) maps the drift geology of the site as Langley Silt (Brickearth) overlying the Kempton Park Gravel Terrace, which was deposited during the Devensian stage of the Pleistocene. The underlying solid geology consists of Eocene London Clay.

Natural deposits seen during the excavations comprise loose yellow-grey sands that form part of the Kempton Park Gravels and which were observed to be at least 1.40m deep. The gravels had been truncated across the site, but had a highest recorded level of 6.65m OD towards the north-eastern corner and sloped down to 5.78m OD towards the southern part of the excavated area.

Sealing the terrace gravels towards the east of the site was a layer of orange-brown sandy silt-clay comprising the Brickearth of the Langley Silt Complex, which had a maximum recorded height of 7.01m OD in the north-eastern portion of the site and 6.73m OD towards the south.

At the eastern edge of the site the excavation of cut features revealed an off-white to light grey archaeologically-sterile calcareous silt which had a highest recorded level of 6.59m OD. This has been interpreted as a tufaceous deposit, caused by calcium carbonate precipitation under a cool water (near ambient temperature) regime, and its presence may indicate an ancient former stream or spring in this location (Ford & Pedley 1996, 117–75). The soil chemistry was quite acidic so there was very poor preservation of faunal material and no preservation of archaeobotanical material (see Meddens below).

Methodology

Due to the proximity of the Roman road, the site partially lies within an Archaeological Priority Zone as identified in the Unitary Development Plan of Hounslow. Prior to its proposed redevelopment a Desk Based Assessment was commissioned by SLR Consulting (Malim 2012). The assessment identified modern riverside warehousing and an underground car park which had removed all archaeological deposits within the southern part of the site (Fig 2), but also a high potential for prehistoric through to Roman archaeological remains surviving within the northern half of the site. It recommended that an evaluation be undertaken, which involved the excavation of three trenches, two positioned perpendicular to Kew Bridge Road and a third on a north-west to south-east alignment in the middle of the car park (Fig 2). These confirmed the survival of archaeological deposits in the northern part of the site, including possible remnants of the Roman roadside ditch and a number of scattered undated features (Humphrey 2013).

These results were sufficient to warrant further investigation at the site which involved open area excavation (Fig 2) (Mayo 2013; Humphrey 2014). A 'Strip and Map' exercise monitored the removal of all hardstanding surfaces and the machine excavation of modern deposits to reveal archaeological levels.

In order to facilitate the development

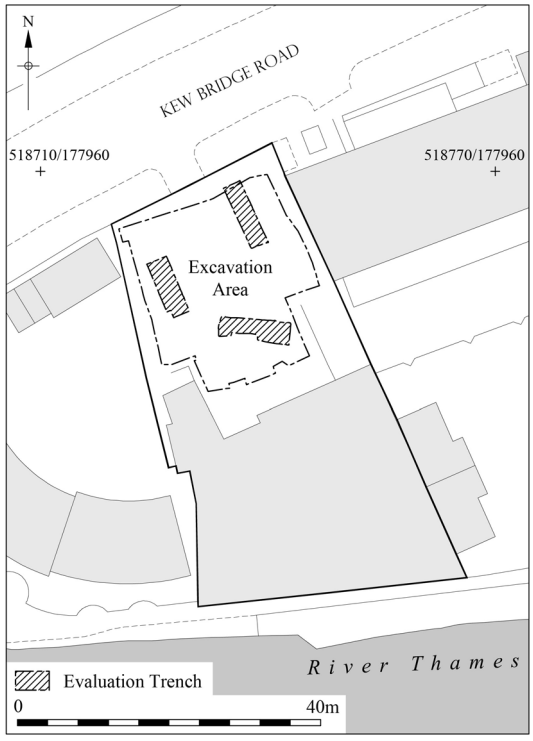


Fig 2. Trench location (scale 1:1000)

programme, the excavation was conducted in a sequence of small open areas. Interpretation has therefore been hampered by the fragmented nature of the archaeological deposits caused by the severe truncation that had occurred across the site, but also by the piecemeal way in which the excavation proceeded. Often different parts of even relatively small areas had to be investigated sequentially and as a result many of the significant features were excavated in portions at different times. Dating relies solely on artefact typologies and stratigraphic sequences, as all attempts at obtaining radiocarbon determinations were unsuccessful. Finds were initially three-dimensionally recorded but owing to the sheer quantities present in some features it was decided to excavate the fills of these in 100mm spits.

ARCHAEOLOGICAL SEQUENCE: DESCRIPTION

Phase 1: Mesolithic Activity (Figs 3 & 7)

The earliest evidence for human activity at the site comprises struck flints that can be dated to the Mesolithic (*c.*9600–*c.*4100 BC), recovered from the fills of the palaeochannel flowing along the western side of the site (see Bishop below). Additionally, two features that also contained Mesolithic struck flints were recorded in the eastern portion of the site. These were the earliest cut features encountered and pre-date the Early Neolithic ditches recorded in this locality (see Phases 2 and 3, below).

The palaeochannel [298] was aligned on an approximate north-east to south-west course and extended beyond the western limit of excavation of the site (Fig 3; Fig 7, Section 72). It measured in excess of 17.50m long by 4.40m wide and was 0.70m deep (top level 6.95m OD and base at 6.16m OD). It was filled with several discrete deposits which, in contrast to the fills of the cut features seen to the east, appeared to be fluvial. The primary fill [296] of the palaeochannel was a 0.50m thick, orange-brown sandy clay (top level 6.70m OD). It produced no cultural material, but did preserve the rotted impressions of a tree branch. The channel's second fill [295] was 0.40m thick with upper levels between 6.71m OD and 6.89m OD and consisted of mid-reddish-brown sandy clay. The uppermost fill of this feature was [294], a firm, mid greyish-brown, silty sand that was 0.20m thick (top 6.89m OD). Small circular stains were seen vertically penetrating the fills of the palaeochannel, which were interpreted as the rootholes of reeds and rushes growing within the channel as it was silting up.

All three fills produced small quantities of struck flint in good condition, amounting to 15 pieces in total, of which five comprised prismatic blades. These can be dated to the Mesolithic or Early Neolithic periods and the absence of any pottery could be interpreted as indicative of an earlier rather than later date. A small amount of unworked burnt flint was also present within the fills, suggesting the presence of hearths in the vicinity.

The two cut features were located around

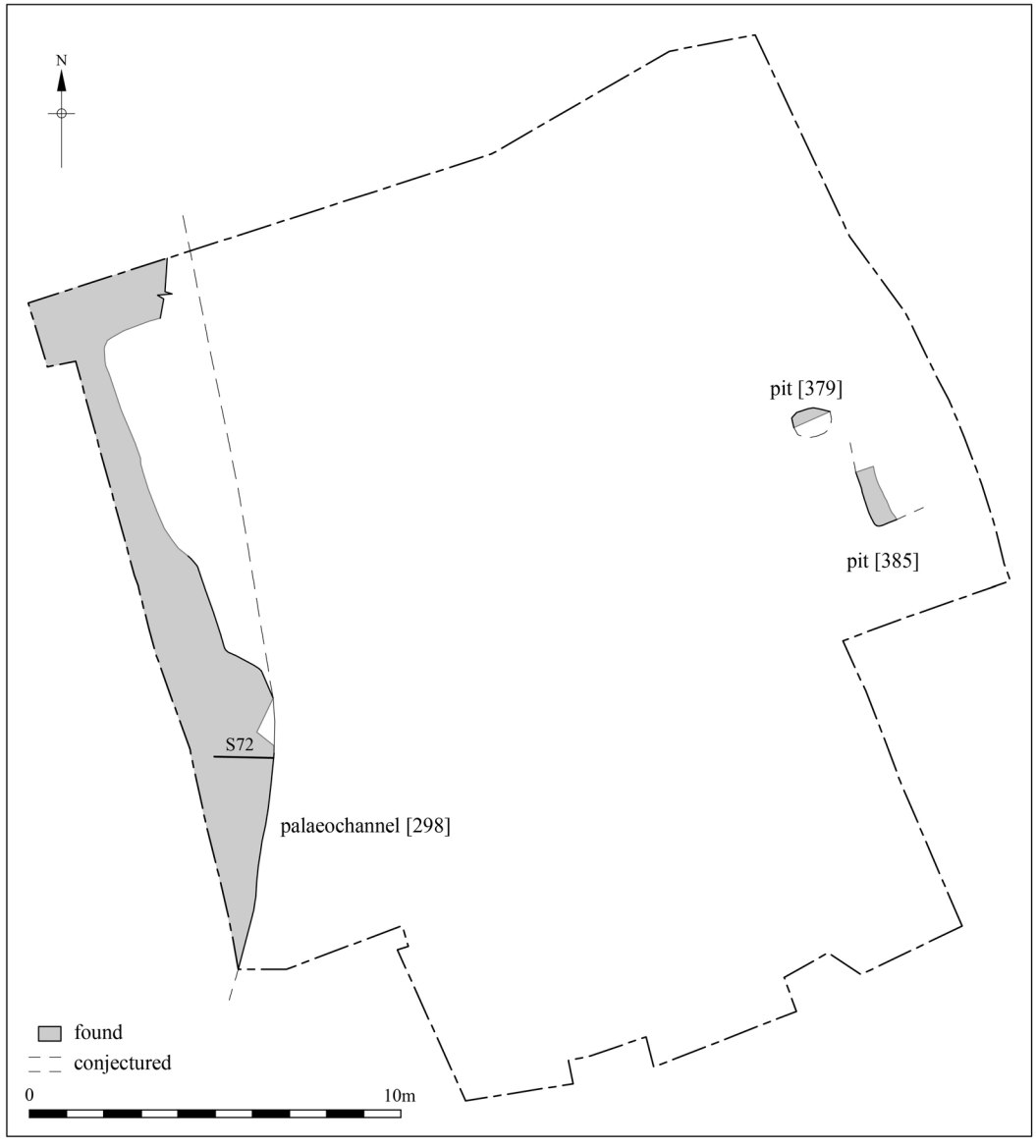


Fig 3. Phase 1: palaeochannel and features [379] and [385] (scale 1:200)

17m to the east of the palaeochannel (Fig 3). Pit [379] was seen in a slot excavated through a later ditch and measured 0.90m from east to west, but its southern extent was not ascertained. Its single fill [378] was 0.21m thick and composed of a firm, very light greyish silt with calcareous inclusions, most probably introduced from the tufa layer through which it was cut (Fig 7, Section 79). This fill produced five pieces of struck flint, including a micro-burin which can be dated to the Mesolithic. To the south of this was a shallow feature [385], possibly the south-western portion of a pit dug into natural sand. This measured 1.58m north to south by 0.66m east to west and was 0.18 deep, partly truncated by ditch [386]. Its sides sloped gently from a height of 6.64m OD down to a flat base. Its fill [384] comprised a dark yellow-brown sandy silt which produced

a single struck flint, an obliquely truncated Mesolithic microlith (see Bishop below).

Phase 2: Early Neolithic Ditch Sequence (Fig 4)

Along the eastern side of the site a series of substantial ditches were dug, which can be dated by their associated pottery and struck flints to the Early Neolithic period (*c.*4100–*c.*3400 BC). The pottery consists of a Plain Bowl/Decorated Ware assemblage dated on stylistic grounds to *c.*3600–*c.*3300 BC (see Cotton below).

Truncating pit [379] was ditch cut [371], which had a 'U'-shaped profile with gently curving sides and a rounded base (Fig 4; Fig 7, Section 79). It was aligned on an approximate north-west to south-east orientation; its recorded length was 3.52m and it was at least 1.84m wide as its eastern side had been completely truncated by a later linear feature [341]. Its greyish-brown, silty clay fill [370] was 0.52m thick (top 6.77m OD and base 6.24m OD). It produced four struck flints, including an edge-trimmed prismatic blade. Cut [386] appears to represent a southern continuation of ditch [371], as it was on a similar alignment, although separated from it by a modern service trench (Fig 4; Fig. 7, Section 82). The excavated portion of [386] was 4.12m long and at least 1.40m wide; its eastern side was truncated. The western side sloped gradually down to a flat base at 5.68m OD. Its primary fill [367] consisted of a 0.35m thick, light yellow-brown sandy silt (top 6.25m OD); the secondary fill [366] comprised a 0.54m thick, light grey sandy silt (top 6.61m OD). Both fills produced Early Neolithic pottery and struck flint, the latter including a flake struck from a ground flint implement, most probably an axehead. Other finds from this ditch included a cattle-size vertebra, the only faunal material recovered from this phase (see Rielly below).

Immediately to the west of ditch [371]/[386] was cut [318], which probably represents another ditch of a similar size and shape, although only parts of its western side survived (Fig 4; Fig 7, Sections 73 & 76). Its eastern and northern extents were severely truncated and its stratigraphic relationships are unclear, but it appears to have curved north-eastwards towards ditch [371] and truncated both it and ditch [386]. As seen,

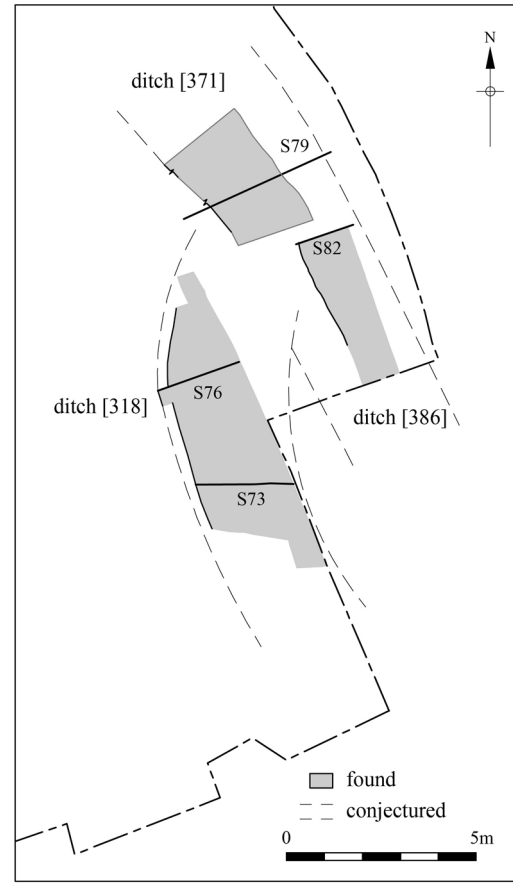


Fig 4. Phase 2: Early Neolithic ditches [371]/[386] and [318] (scale 1:200)

it measured 8.38m north to south and was approximately 5m wide and 0.64m deep (top 6.75m OD and base 5.92m OD). Its primary fill, [289], [322], consisted of a light yellow-brown clayey sandy silt that ranged in thickness from 0.26m to 0.73m (top between 6.11m OD and 6.60m OD). The southern end of the ditch was heavily truncated, but two further fills were recorded within its northern part. The secondary fill [323] comprised a dark grey, charcoal rich silt, 0.12m thick (top 6.33m OD), overlain by [326], a soft, yellow-brown, sandy silt, 0.43m thick (top 6.75m OD).

All three fills produced finds of struck flint and pottery. The pottery could be dated to the Early Neolithic and amounted to 45 sherds weighing 351g (see Cotton below). The struck flint assemblage comprised 187

pieces and included a high proportion of prismatic blades. Some of this is likely to be residual, as indicated by the presence of an obliquely truncated microlith and a truncated blade, both of which can be dated to the Mesolithic (see Bishop below). However, there are also a number of flint flakes that retain polished surfaces on their dorsal surfaces, indicating that they were struck from a ground implement such as an axehead and are likely to be of Early Neolithic date. The type of flint used to produce these polished flakes is identical to the flake with polishing on it recovered from ditch [386], so it is likely that they were all struck from the same implement. A further seven retouched implements were also recovered from this ditch; these consisted of serrates or scrapers.

Phase 3: Early Neolithic Reorganisation of Ditches (Fig 5)

After the Phase 2 ditches had been largely infilled they were re-cut, although on slightly different alignments. The fills of these later ditches were significantly different to the earlier ones, being darker, more humic and containing higher concentrations of pottery and struck flints. While the ceramic assemblage from this phase is of the same date as the material from the previous one, it was larger and more diverse (see Cotton below). The features also produced a total of six cattle and sheep/goat bones (see Rielly below). Ditch [272]/[361] truncated the southern part of ditch [318] (Fig 5; Fig 7, Section 73). Its excavated portion measured 4.24m north to south; it was 2.37m wide and up to 0.57m deep (top 6.72m OD and base 5.98m OD). Its primary fill [319]/[358] comprised a 100mm thick, dark bluish-grey sandy silt (top 6.27m OD). Overlying [319]/[358], secondary fill [317]/[352] was a moderately compacted light grey to orange-brown, sandy silt, 0.40m thick (top 6.70m OD). As both fills produced significant quantities of struck flints and pottery, it was decided to excavate the feature's southern part in a series of 100mm thick spits, [286], [285], [281] and [271], in an attempt to identify any changes in the nature of the deposits and their assemblage. All four of the spits consisted of a similar light grey to orange

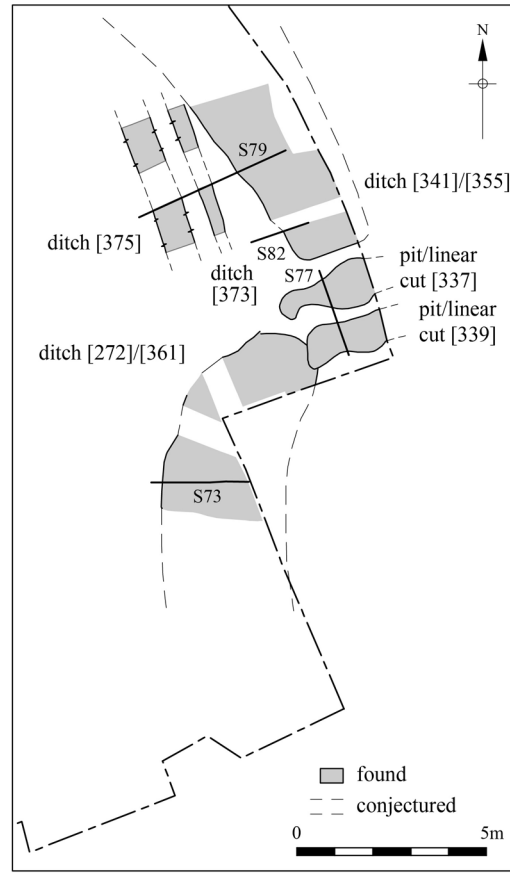


Fig 5. Phase 3: Early Neolithic ditches [272]/[361] and [341]/[355], and features [337] and [339] (scale 1:200)

brown sandy silt; the three uppermost spits had dark outlines running through them, which were thought to represent both vertical and horizontal decomposed timbers, some of the former possibly representing intrusive stakes (see Phase 4 below). The struck flints recovered from this ditch amounted to 825 pieces, making it the largest assemblage recovered from any of the features on site (see Bishop below). In addition there were numerous fragments of unworked burnt flint, a fragment of a probable sandstone saddle quern and some unidentifiable fish bones (see Meddens below). Also 78 sherds of Early Neolithic pottery (weighing 769g) were recovered from this ditch (see Cotton below). No obvious differences in either the character or composition of the finds could

be detected in the assemblages from the different spits. It appears that all this material was discarded as either a single episode of disposal or a series of closely spaced events.

Cutting through Phase 2 ditch [371]/[386] was ditch [341]/[355], the two elements of this feature were also separated by a modern service trench (Fig 5; Fig 7, Sections 77, 79 & 82). This ditch had a sub-rectangular southern terminal, steeply sloping sides and a slightly concave base. Its excavated length was 5.12m; it was at least 2.48m wide and continued beyond the eastern limits of excavation. It was also decided to excavate the fills of [341]/[354] in spits; the first [360] coincided with what is thought to be the feature's primary fill, a mid to light greyish-brown silty clay, 0.22m thick (top 6.36m OD). Overlying this was spit [359], a dark brownish-grey clayey silt, 0.12m thick (top 6.49m OD), thought to be the first phase of deliberate backfilling. It was sealed by spit [353], a mid–dark yellowish-greyish brown clayey silt, 0.13m thick (top 6.36m OD). The fourth spit was [346] a light to mid-yellow and greyish-brown silty clay, 0.21m thick (top 6.58m OD). The uppermost spit [340] was a similar light to mid-yellow greyish-brown silty clay, 0.11m thick (top 6.69m OD). All of the fills or spits produced Early Neolithic pottery and struck flints. The pottery amounting to 84 sherds (weighing 986g) and the struck flints consisted of 346 pieces.

Immediately to the west of ditch [341] and cutting into earlier ditch [371] were two heavily truncated linear features, [373] and [375], although due to the degree of truncation it was not certain whether these consisted of two narrow parallel ditches or a much wider single feature (over 2m wide) with an irregular base (Fig 5; Fig 7, Section 79). Both features were aligned north-west to south-west and were at least 4.77m long (top 6.80m OD, base at 6.53m OD). The eastern ditch [373] was at least 0.52m wide and the western one [375] was at least 0.64m wide. The two features were filled with [372] and [374] respectively, a greyish-brown silty sandy clay containing small quantities of Early Neolithic pottery, struck flints and unworked burnt flints.

Two parallel, irregular linear features were located immediately to the southern terminal of the south ditch, [341]/[355] (Fig 5; Fig 7, Section 77). Cut [339] measured 2.40m from its western terminal and continued beyond the eastern limit of excavation; it was 0.78m at its widest and 0.40m deep. It had a stepped northern side, whilst its southern one was concave. Cut [339] was filled with [338], a greyish-brown silty sand that contained four sherds of Early Neolithic pottery and four struck flints, including a prismatic blade. Its western terminal truncated the eastern side of [361]. Immediately north of [339], cut [337] represented a much less substantial feature. In plan it measured 2.50m long from its western terminal to the eastern limit of excavation, and was 1.15m wide and 0.24m deep (top 6.57m OD and base 6.35m OD). It was filled with a greyish-brown silty sand, but produced no finds.

Phase 4: Prehistoric Settlement Features: Postholes, Pits and Stakeholes (Fig 6)

Following the infilling of the Early Neolithic ditches and other features, the character of the activity on site dramatically changed. Numerous features, representing a variety of small pits, postholes, stakeholes and narrow linear slots, were dug through the upper fills of the Phase 2 and 3 features (Fig 6). Numerous dark stains were also recorded, both on the top surface of the infilled ditches, but also extending into their fills, suggesting the ephemeral remains of driven stakes (see Phase 3 above).

Concentrated around the area of infilled ditches [318] and [272]/[361] was a dense and often intercutting cluster of features, containing no recognisable structural groups or other discernible patterning. A further collection of seven stakeholes, [324], were recorded some 6m to the north-east of this cluster, cutting into the fills of ditch [341]/[355].

The larger ovoid or oval shaped features (between 0.8m and 1.20m long and up to 0.30m deep) have been interpreted as pits, whilst smaller oval features (between 0.16m and 0.40m in diameter and up to 0.15m deep) are more likely to be postholes. The stakeholes measured between 50mm and 100mm in diameter and had been driven up to 150mm into the ground. Some of these stakeholes exhibited staining around their outer edges, presumably representing rotted

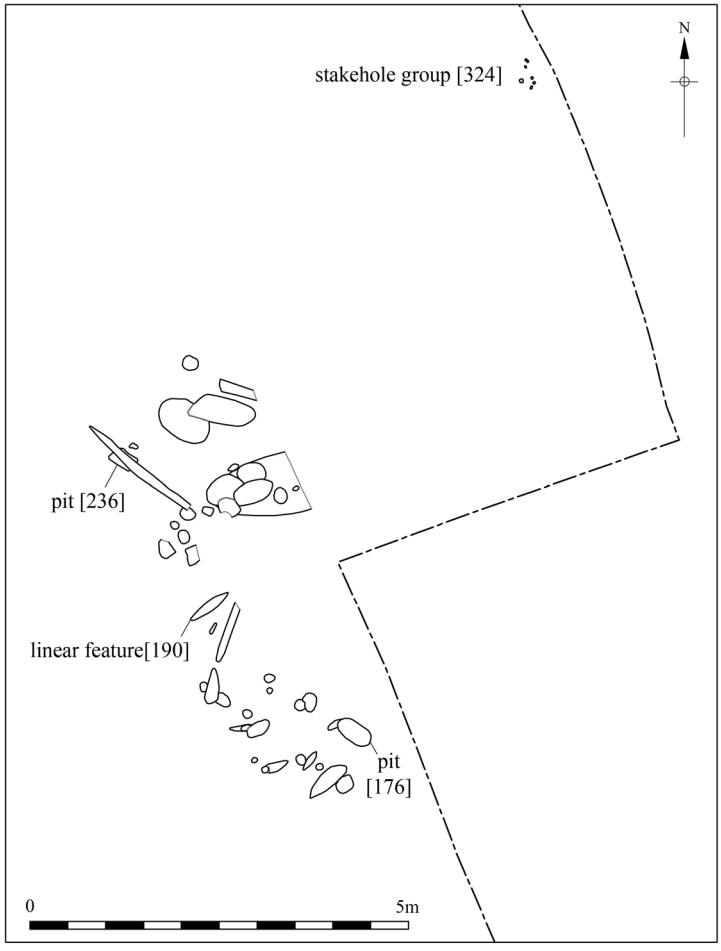


Fig 6. Phase 4: prehistoric pits, postholes and stakeholes: NB only those mentioned in the text have been numbered on this plan (scale 1:100)

wood. All of these features were filled with greyish-brown sandy silt clay, containing charcoal flacks and occasionally very small daub fragments. A few narrow linear slots were recorded (up to 0.80m in length, 100mm wide and up to 150mm deep). These slots were filled with dark brown organic rich silt clay and appeared to represent the impressions of structural timbers that had rotted *in situ*, possibly sill beams or collapsed upright timbers.

These features produced 56 sherds of pottery (weighing 245g). Nearly all of these came from pit [236] with the majority of the sherds representing a single vessel (see Cotton below). The struck flints were more evenly spread, with 90 pieces being recovered from 26 features, although no individual fill produced more than two pieces that measured 15mm or more in maximum diameter and the overall assemblage was dominated by micro-debitage. The only notable piece was a laurel leaf point, a diagnostic Early Neolithic tool, which was found in linear feature [190] (see Bishop below).

Both the pottery and struck flints are of a similar character to the assemblages recovered from the Phase 2 and 3 features. Therefore, the Phase 4 assemblage may either have been contemporary with the usage of these features or it could be entirely composed of residual material. It is probable that the majority of these features are of Early Neolithic date, but a later prehistoric date for some of them is a possibility. The accurate dating of these features is hindered by the presence of intrusive cultural material, including clay tobacco pipes, perhaps as result of biological reworking of soil deposits. The successful radiocarbon determ-

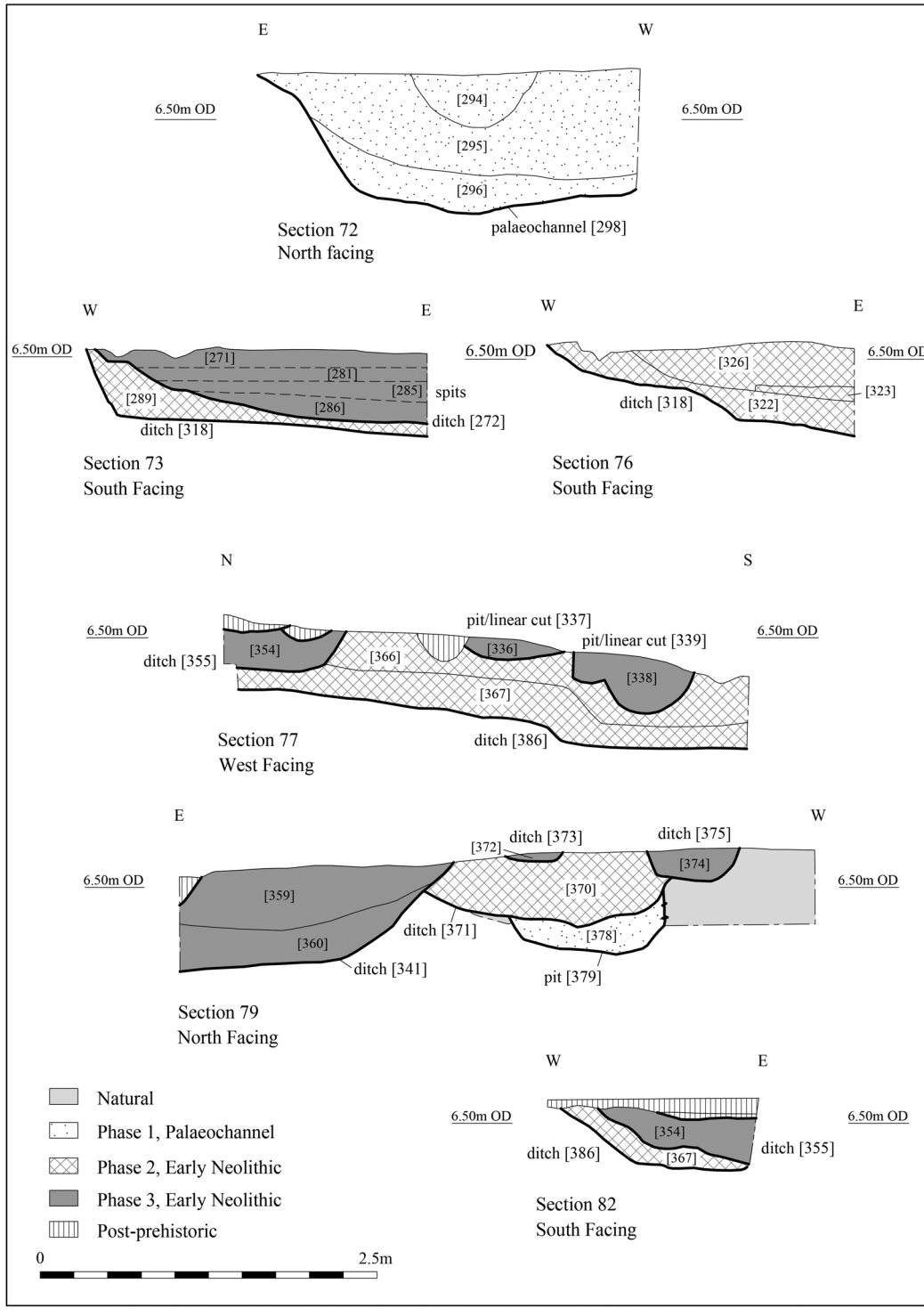


Fig 7. Phases 1, 2 and 3: Sections (scale 1:50)

inations from the site, which came from pit [176], produced dates of 1316–1435 cal AD (SUERC 59897: 543+/–29 uncal BP) (*Maloideae* charcoal) and 1497–1662 cal AD (SUERC 59901: 288+/–27 uncal BP) (*Prunus* charcoal). These are thought to represent the relatively recent contamination of deposits by medieval and post-medieval material, but whilst the majority of these features are thought to be prehistoric it is far from certain that they all were.

Post-Prehistoric Features

Across the site numerous scattered features comprising a variety of pits and ditches were recorded (not illustrated). Some of these could be dated to the Roman period by their associated pottery and include remnants of what might be part of the London to Silchester roadside ditch. Sealing the Roman and prehistoric features was a sandy silt deposit interpreted as a naturally developed soil horizon, which may have been formed partly through ploughing. This in turn had been cut by numerous features dated to the post-medieval period, including various sequences of building foundations culminating in the 1970s office block, which had extensively truncated much of the earlier archaeological deposits.

SPECIALIST REPORTS

The Neolithic Pottery

Jon Cotton

Introduction

A small prehistoric ceramic assemblage comprising 289 sherds (weighing 2507g) was recovered from 27 contexts across the site. These figures do not include comminuted ceramic crumbs or a number of barely recognisable body sherds encased within blocks of dried brickearth. Nearly all of the contexts comprise the successive fills of large features assigned to Phases 2 and 3.

Though modest in size the assemblage is large enough to be diagnostic and it is virtually all of Early Neolithic date. A minimum of around a hundred or so vessels are represented; a selection has been illustrated (Fig 8). The bulk of the assemblage comprises plain body sherds, some large, as well as twenty rims and fragments of lower walls/rounded bases. Decorated sherds are present, but are in a minority. A restricted number of vessel forms are represented: these comprise large and medium sized open bowls with externally expanded rims; medium sized open bowls with rounded/flattened rims; and medium/small open cups with simple rounded rims.

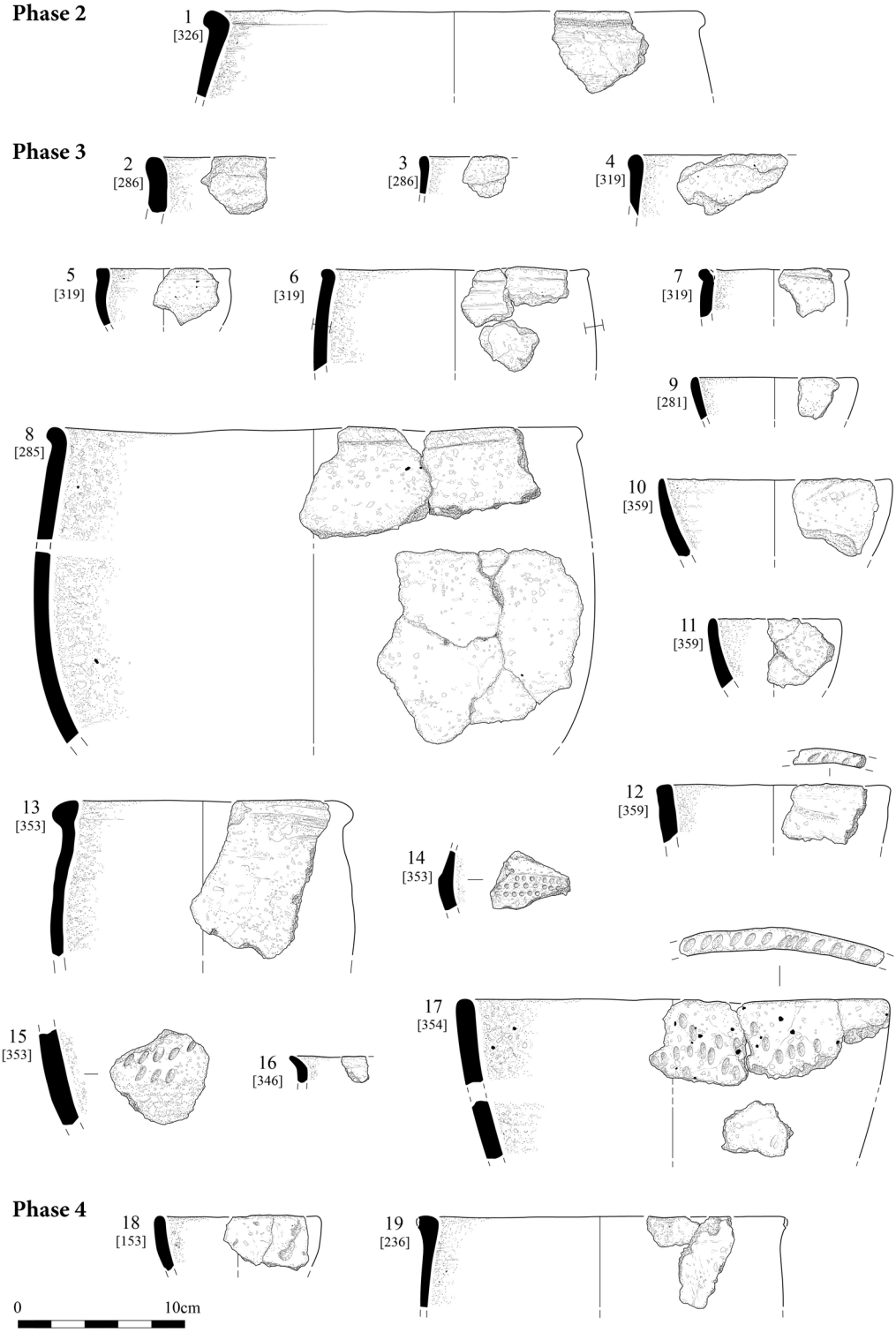
Crushed burnt flint was employed throughout to open the predominantly sandy clay matrices, and up to seven fabric recipes could be defined (see below). Vessel walls vary between <4mm to >10mm in thickness; surfaces and edges are usually worn and occasionally abraded, though surface finishes (*eg* burnishing/wiping/finger smearing) are observable.

Overall, 95.5% of the ceramic assemblage by sherd count, and 98.8% by weight, was recovered from prehistoric Phases 2, 3 and 4, with little later intrusive material apparent (four sherds weighing 15g of Roman/medieval date). By the same token, very few prehistoric sherds appear to have been redeposited in later features. This encourages the view that the integrity of the ceramic

Table 1. Neolithic pottery, all phases, by sherd count, estimated number of vessels (ENV) and weight

Phase	Sherd count	ENV	Weight (g)
2	52	18	378
3	168*	76	1854*
4	56	9	245
Post-prehistoric deposits	13	5	30
Total	**289**	**108**	**2507**

*Numbers and weights include two unstratified sherds, one of which conjoins with a stratified sherd


Phase 2
1
[326]
Phase 3
2
[286]
3
[286]
4
[319]
5
[319]
6
[319]
7
[319]
9
[281]
8
[285]
10
[359]
11
[359]
12
[359]
13
[353]
14
[353]
15
[353]
16
[346]
17
[354]
Phase 4
18
[153]
19
[236]
0
10cm

assemblage is high. While no individual context produced more than fifty sherds – and most considerably fewer – it is clear that a large proportion of the assemblage comes from four substantial features interpreted as possible ditch segments or large elongated pits assigned to Phases 2 and particularly 3.

Fabric

All of the sherds contain crushed burnt flint temper to a greater or lesser degree, and the clay matrices are all variably sandy. Seven main fabrics were identified, as follows:

KEB1 Hard, well-fired granular, slightly sandy matrix with moderate quantities of moderately sorted sub-angular crushed burnt flint up to 5mm in size. Surfaces smoothed and wiped.

KEB2 Hard, well-fired smooth silty matrix with rare–sparse poorly sorted sub-angular crushed burnt flint with occasional individual clasts up to 8mm in size. Surfaces smoothed and polished, with the possible intention of hiding the inclusions.

KEB3 Hard, well-fired granular sandy matrix with very common poorly sorted sub-angular crushed burnt flint with individual clasts up to 5mm in size.

KEB4 Hard, well-fired brittle granular sandy matrix with sparse–moderate poorly sorted sub-angular crushed burnt flint with individual clasts up to 4mm in size. Surfaces smoothed and wiped.

KEB5 Soft, granular sandy matrix with rare, moderately sorted sub-angular crushed burnt flint mostly less than 2mm in size with occasional larger individual clasts. Thin walled.

KEB6 Soft, smooth silty matrix with burnt out, possibly organic, voids and occasional sub-rounded crushed burnt flint less than 4mm in size. Surfaces smoothed; thin walled.

KEB7 Similar in all respects to KEB1, but thin walled.

No petrological work has been attempted, but it is likely that all of these fabrics are local to the site. Such use of local resources has been confirmed where thin-sectioning of Early Neolithic assemblages has been carried out (*eg* Avery 1982, 33–5; Drewett 1977, 218; Robertson-Mackay 1987, 67), suggesting that readily available sources of raw materials were invariably exploited by potters to meet their immediate needs.

KEB1 was the most commonly employed fabric (38% by sherd count and 63.5% by weight), with KEB7 a thinner walled variant. Several of the fabrics, *eg* KEB2 and KEB6, appear to have been reserved for the finer vessels such as a decorated bowl (Fig 8.14) and for thin walled cups (*eg* Figs 8.9 & 18), though the cups in Fig 8.10–11 and 16 are in fabric KEB7.

Overall the KEB13 fabrics fall within the standard Thames valley repertoire and are directly comparable with those utilised for larger assemblages, as at the Staines causewayed enclosure (Robertson-Mackay 1987), Runnymede Bridge (Kinnes in Needham 1991), Perry Oaks (Leivers in Framework Archaeology 2010) and Horton (Raymond

Fig 8. (opposite) The pottery. Key: 1. Slightly inturned plain bowl in fabric KEB4 with externally expanded squared rim; 2. Plain open bowl in fabric KEB3 with concave neck and slightly everted rim, interior wiping; 3. Plain open bowl in fabric KEB7 with everted rim, interior wiping; 4. Worn plain open bowl in fabric KEB1 with externally expanded/ rolled rim; 5. Small plain open/ neutral bowl in fabric KEB7 with slightly expanded flattened rim; 6. Plain open bowl in friable fabric KEB1 with slightly expanded and flattened rim; 7. Small plain open/ neutral bowl in fabric KEB4 with externally expanded rim and exterior smoothing; 8. Conjoining sherds of large plain open/ neutral bowl in fabric KEB1 with externally expanded/ rounded rim, traces of external smoothing and internal wiping; 9. Small plain open cup in fabric KEB6 with simple rounded rim; 10 & 11. Small plain open cups in fabric KEB7 with simple rounded rim and internal smoothing; 12. Open/ neutral bowl in fabric KEB1 with simple upright flattened fluted rim and finger smeared exterior; 13. Plain open/ neutral bowl in fabric KEB1 with externally expanded rim and smoothed surfaces; 14. Weakly carinated open bowl in fabric KEB2 with smoothed surfaces and horizontal rows of impressed dots on and below the carination; 15. Worn and abraded thick walled body sherd in fabric KEB1 with horizontal row (or rows) of fingertip impressions; 16. Small open bowl/ cup in fabric KEB7 with flaring everted rim; 17. Multiple sherds of an open bowl in fabric KEB1 with a simple upright flattened fluted rim with short oval flutes (possibly impressed with a small pebble) and random stab impressions on the upper wall; 18. Plain open cup in fabric KEB6 with simple upright rim; 19. Plain open bowl in fabric KEB4 with externally expanded/ rolled rim and thin wall (scale 1:4)

in Ford & Pine 2003), for example. The unusual and possibly organic component noted in fabric KEB6 may be analogous to that noted at Kingsborough 1 in Sheppey, Kent (Allen *et al* 2008, Appendix 1, KFN1).

Form

The small size of many of the sherds makes any estimation of form, let alone capacity, difficult to ascertain. However, the rims suggest a basic bi-partite division into bowls of varying sizes from large to medium/small, and cups in the medium/small size range. A majority of the bowls are of open or neutral form; cups are invariably open in form.

Rims are both simple and externally expanded/thickened, occasionally everted, in form; one or two of the externally expanded forms are slightly rolled. Where present shoulders are mostly rounded, and only one weakly carinated vessel could be identified amongst the surviving sherds (Fig 8.14). No perforations (either pre- or post-firing), handles or lugs were present. In view of the small size and restricted nature of the assemblage, however, these observations carry little statistical weight.

Several bowls are represented by multiple, occasionally conjoining, sherds of reasonable size (*eg* Fig 8.8 & 17), and several appear to have unfeasibly thin body walls below heavy expanded rims (*eg* Fig 8.1 & 19).

Condition, Surface Treatment and Decoration

Although sherd size appears to vary between the various phases/contexts – with those from the Phase 2 contexts generally smaller than those from Phase 3 contexts, for example – surface condition is broadly similar across all phases/contexts. Surfaces and edges are invariably worn and occasionally severely abraded, even in instances where it has been possible to identify conjoins. Some sherds are shattered and have lost one or other of their surfaces, while others have traces of mineralised surface encrustation. It seems likely that much of this wear and tear is due to the free-draining properties of the brickearth soils in which the sherds have lain over the millennia.

Surface wear notwithstanding, most vessels appear to have been at least perfunctorily smoothed, finger smeared and/or wiped, both internally and externally. A few, such as those in fabric KEB2, have been smoothed and lightly burnished, perhaps with the intention of masking the flint inclusions; in most cases, however, the potters were content to allow the inclusions to break through both internal and external wall surfaces.

Decoration is restricted to light surface ripple burnishing or fluting on three vessels, and shallow impressions on two others. Most of these come from the fills of Phase 3 context [341]/[355]. There is no evidence for incised decoration. The most extensively decorated vessel comprises 21 sherds in fabric KEB1 from an open/neutral bowl in fill [354] of ditch cut [341]/[355] (Fig 8.17). This carries a series of short oval flutes/ripples on top of its rim and on the exterior surface (possibly executed with a small pebble), together with a series of random shallow stab impressions on the upper body. A further lightly fluted rim, also in fabric KEB1, came from fill [359] of cut [341]/[355] (Fig 8.12); a small fluted body sherd in fabric KEB1 came from primary fill [286] of cut [272]/[361].

The two other decorated body sherds were both recovered from fill [353] of cut [341]/[355]. The first comprised a weakly carinated shoulder in fabric KEB2 with horizontal rows of impressed dots on and below the carination (Fig 8.14). The second (Fig 8.15) comprised a worn and abraded thick walled sherd in fabric KEB1 with a short series of horizontal fingertip impressions somewhat reminiscent of Middle Neolithic Peterborough Ware.

Distribution of Fabrics and Forms

Fifty-two sherds weighing 378g came from six contexts within two features [318] and [386] assigned to Phase 2. This comprised nearly 19% of the total assemblage by sherd count and 15.6% by weight. Of these the majority were recovered from a sequence of fills within the lower part of large ditch [318]; only a handful of sherds were recovered from the fill of [386], another large ditch. Averaging just over 7g in weight, the sherds from these Phase 2 contexts were noticeably smaller and more fragmented than those recovered from contexts attributable to Phase 3, the latter averaging 11g in weight. Sherds likely to belong to the same vessel

(though not actually conjoining) were noted across several fills within [318]; these included sherds of a KEB4 fabric bowl with a slightly inturned, externally expanded plain rim from fills [323] and [326] (Fig 8.1).

One hundred and sixty-eight sherds weighing 1854g were recovered from 14 contexts within three features [272]/[361], [341]/[355] and [339] assigned to Phase 3. This comprised 61% of the total assemblage by sherd count and nearly 74% by weight. Virtually all came from the lower fills of the two large ditches [272]/[361] and [341]/[355]. The assemblage from [272]/[361], principally from its primary fills, largely comprised sherds of bowl forms in various fabrics, including a number of conjoining sherds. That from [341]/[355], principally from its secondary fills, was more diverse, and incorporated the few decorated sherds, including part of a weakly carinated shoulder with impressed decoration in fabric KEB2 (no. 14), fragments of ripple fluted bowls in fabric KEB1 (Fig 8.12 & 17) and sherds of cups in fabric KEB7 (Fig 8.10, 11 & 16). The fingertip decorated sherd (Fig 8.15) in fabric KEB1 is somewhat unusual in this company, and could have Middle Neolithic affinities.

Smaller quantities of ceramic material were recovered from several small pits and postholes assigned to Phase 4. Most notable amongst these were the conjoining sherds of a cup in fabric KEB6 from fill [153] of pit [154] (Fig 8.18), and a number of sherds belonging to a plain thin-walled open bowl with a rolled rim in fabric KEB4 from pit [236] (Fig 8.19).

Discussion

The small stratified pottery assemblage from KEB13 adds not only context but also a ceramic sequence to a local record largely dominated by stray finds recovered from river channels (*eg* Penn *et al* 1984; Sanford 1968; 1970), the Thames and its foreshore (*eg* Cockburn *et al* 1969, 32–3; Macdonald 1976, 21), and from the areas of adjacent riverbank (*eg* Ferrier in Canham 1978b, 40–1; Cooke & Phillpotts 2015; Warren 1977). In wider regional terms it is also analogous to a number of larger assemblages recovered from causewayed enclosures and other monumental sites (*eg* Hedges & Buckley 1978; Robertson-Mackay 1987; Ford & Pine 2003; Framework Archaeology 2010), in terms of the fabric recipes employed, the vessel forms created, and also the (limited) decorative techniques deployed upon them.

The KEB13 pottery comprises a Plain Bowl/Decorated Ware assemblage. At more than 1:25 the ratio of decorated to plain vessels is broadly comparable to the situation at Perry Oaks and Staines causewayed enclosure (Leivers in Framework Archaeology 2010, 38), though the small size of the KEB13 assemblage means that the figure is little more than indicative. These ceramics are thought to have emerged from around 3600 BC and continued in use down to *c.*3300 BC. As such they overlap with the development of Peterborough Ware (*c.*3400–2800 BC), whose Middle Neolithic origins can be sought in the earlier Decorated Ware tradition. It seems clear, however, that different communities drew upon a repertoire of well-established and well understood ceramic traits that were employed (or not) on vessels made, used and disposed of according to need as circumstances dictated.

The KEB13 ceramic assemblage derives from at least two presumably closely successive phases of activity. The earlier of the two, Phase 2, comprising possible ditches [318] and [386], produced only small amounts of material and few feature sherds. The degree of fragmentation was also rather higher in this earlier phase (average sherd weight 7g) than in the succeeding Phase 3 (average sherd weight 11g), which might suggest that the material accumulated over a relatively extended period of time – though in truth there was little perceptible difference in the condition of individual sherds across the different phases.

The ceramic assemblage from the Phase 3 features is larger and more diverse in terms of vessel form and treatment, and the dominance of fabric KEB1 is even more marked (72% of the assemblage, compared with 51% in Phase 2). The two largest features [272]/[361] and [341]/[355] yielded similar quantities of material, though the secondary fills of the latter produced all of the decorated sherds and most of the cup sherds. It is possible that some sort of chronological progression might be perceived here, although given the small

quantities of material involved, no undue significance ought perhaps to be attached to this observation.

The presence of multiple sherds of the same vessels from the large features assigned to Phase 3 (*eg* Figs 8.9 & 18), together with the generally larger quantities of material involved, also hint at a different mode of accumulation, and over a shorter time-span. Obvious points of comparison are with deposits made in the ditches of causewayed enclosures and with the Early Neolithic midden accumulations at Runnymede, and in former river channels at Eton Rowing Lake (Allen *et al* 2004, 85–91).

As far as fabric and form are concerned the various components of the KEB13 assemblage can be well paralleled amongst other local and regional assemblages. The raw materials for potting (brickearth and flint) are readily available close by, for example, and the simple vessel forms – open bowls with a range of expanded, rolled, everted, upright and flattened rims – can be widely matched elsewhere. Locally these include stray sherds from the Thames at Syon Reach and Chiswick Eyot in the Museum of London (Acc no. A23378) and Gunnersbury Park Museum (Rivett-Carnac Collection), respectively, and the sherds of two Plain Bowls from a pit at Kew Bridge House, 250m or so to the east of the present site (Cooke & Phillpotts 2015, 156).

There are several points of departure, however. The small cups with simple upright rims are less common in many of the other local published assemblages – only Staines causewayed enclosure has any significant number, for example. In addition to the fragmentary cups from KEB13, a complete vessel of comparable form from the Layton Collection now in the Museum of London (Acc no. P13) comes from 'Near Kew Bridge, off Strand Island, from ballast', *ie* from river dredging just downstream of Kew Bridge.

The seemingly perfunctory fluting or ripple burnishing on at least two of the KEB13 vessels (Figs 8.12 & 17) from Phase 3 is worthy of note too. Ripple burnishing is a trait often associated with the Mildenhall style of Decorated Ware, and it has been recognised as a component of Early Neolithic ceramic assemblages on a number of Thames valley sites, *eg* Staines causewayed enclosure (Robertson-Mackay 1987, 84 and fig 47), Launders Lane (Howell *et al* 2011, 26, figs 20–1) and Orsett (Kinnes in Hedges & Buckley 1978, 264 and fig 30, nos 16–17). Furthermore, carbonised residue on sherds of a ripple burnished bowl from a small pit at Matthew Arnold School, Staines furnished a radiocarbon date of 3500–3190 cal BC (Beta 285582) (Jones in Hayman *et al* 2012, 7–8 & fig 1.6). While the ripple burnished vessels at KEB13 lack the precision and elegant finish of those from Staines and from Launders Lane in particular, they presumably adequately met the needs of the potters who made them.

More closely analogous in terms of fabric, form and finish is the weakly carinated bowl with impressed rows of dots from [353] (Fig 8.15): this is closely similar to several vessels from Staines causewayed enclosure (Robertson-Mackay 1987, fig 48, P136 & P137). The presence of the possible Peterborough Ware sherd from the same KEB13 context can be matched on earlier Neolithic sites elsewhere too (*eg* Staines causewayed enclosure, Horton etc). If not intrusive – and there is no particular reason to suppose that it is – its presence here may have implications not only for the dating of the KEB13 assemblage but also for the development of Middle Neolithic impressed wares within the Thames valley.

The KEB13 assemblage is a modest but useful addition to the developing regional picture. Its position within a succession of large features, possibly ditch segments, poses tantalising but currently unanswerable questions as to their nature and function, and calls to mind the small riverside site in Church Street, Twickenham, where sherds of Plain Bowl were recovered from the fill of a 2m wide feature interpreted as a watercourse (Sanford 1968; 1970). Moreover, previous finds of pottery and lithics recorded from this stretch of the Thames (*eg* Cockburn *et al* 1969, 32–4; Adkins & Jackson 1978, 66) suggest that the Early Neolithic activity attested at KEB13 may originally have been part of a locally intensive exploitation of the river and its resources.

Table 2. Detailed breakdown of the Neolithic pottery by phase, context and fabric (sherd count/ENV/weight (g))

	KEB1	KEB2	KEB3	KEB4	KEB5	KEB6	KEB7
Phase 2							
Ditch [318]							
Fill [289]	3/2/60g	7/230g					
Fill [322]	3/1/30g		2/2/39g				8/ –/17g
Fill [333]	1/1/8g						
Fill [323]	7/4/68g		2/1/13g	10/1/37g	1/1/1g		
Fill [326]				1/1/48g			
Ditch [386]							
Fill [384]	7/2/27g						
Phase 3							
Ditch [272]/[361]							
Fill [286]	2/2/28g		2/2/29g			3/1/5g	1/1/4g
Fill [319]	13/6/75g	1/1/6g	1/1/13g	1/1/7g	1/1/1g		5/5/18g
Fill [285]	9*/1*/330g*	11/1/63g	2/1/4g			1/1/7g	
Fill [281]	1/1/5g					3/1/9g	
Fill [271]					1/1/1g	1/1/5g	
Fill [317]	6/4/41g						
Fill [352]**	10/2/98g				3/1/20g		
Ditch [341]/[355]							
Fill [360]	5/1/62g						
Fill [359]	2/2/34g	5/1/20g	4/2/47g		3/1/6g		19/6/100g
Fill [353]	8/8/163g	1/1/12g	1/1/26g		6/6/21g		
Fill [346]	2/2/11g		2/2/10g	1/1/6g			2/2/5g
Fill [340]							1/1/5g
Fill [354]	21/1/453g				1/1/5g		
Linear feature [339]							
Fill [338]			4/1/37g				
Phase 4							
Pit [154]							
Fill [153]						2/1/14g	
Linear feature [198]							
Fill [197]							3/2/7g
Pit [236]							
Fill [235]	3/2/37g		1/1/18g	42/1/153g			5/2/16g
Post-prehistoric deposits			1/1/9g				12/4/21g

*Quantity include two unstratified sherds, one of which conjoins with a stratified sherd
**Multiple body sherds encased within seven blocks of dried brickearth not included

The Mesolithic and Neolithic Lithic Material

Barry Bishop

Introduction

The lithic assemblage from Kew Bridge Road comprises 1,596 pieces of struck flints, one flake struck from a ground stone axehead, a sandstone quern fragment and just under 2.5kg of unworked burnt stone fragments (Table 3). The Early Neolithic Phases features provided most of the material, with the bulk of it coming from two ditches assigned to Phase 3. A full catalogue of all the material, which includes detailed descriptions of all retouched implements and cores, is available in the site archive. The information presented below describes the general characteristic of the assemblage, its distribution across the site and comments on its archaeological significance.

Raw Materials

The flint used to manufacture the struck assemblage varies considerably in colour and texture. The majority of pieces are made from a mottled 'glassy' flint that is predominantly translucent black in colour but which grades into a wide variety of browns and greys. There are also a few flakes made from a dull grey or brown coarser-grained cherty flint with a more 'sugary' texture.

The cores and remnants of cortex on flakes indicate that around 80% of the raw materials consisted of small, heavily rolled gravel pebbles and small cobbles. The knapping potential of these would have been limited, their size only allowing short sequences of flakes to be produced from each pebble and their thermal and mechanical faults hampering attempts to achieve systematic reduction. Nevertheless, these are abundant in the local Pleistocene gravel terraces and were most probably gathered from close by along the margins of the Thames where such deposits are exposed. The deficiencies in their productive potential would therefore be offset by the quantities available and the ease with which they could be obtained.

Around 10% of the flakes have been struck from nodules of 'bullhead bed' flint. This has a rough green cortex with an underlying orange band and tends to be of a good knapping quality (Shepherd 1972). Although such flints can also be found in the local gravel terraces, the proportions present in this assemblage suggest that

Table 3. Composition of the lithic assemblage from Kew Bridge Road by phase

Phase	Decortication flake	Crested flake	Core rejuvenation flake	Chip: flakes >15mm	Core modification flake	Useable flake	Useable blade	Flake fragment >15mm	Flake fragment <15mm	Core	Conchoidal chunk	Shattered cobble	Retouched implement	Phase total	Burnt stone (no.)	Burnt stone (wt:g)	Quernstone
Phase 1	2			5	1	1	5	1	4				2	21	5	102	
Phase 2	23	3	1	11	15	48	22	17	12	12	14	21	10	209	30	296	
Phase 3	139	4	12	169	114	214	103	121	107	42	56	49	59	1189	219	1646	1
Phase 4	6			43		5	2	1	31		1		1	90	49	42	
Post-prehistoric deposits	10		2	7	11	22	19	6	2	3	4		1	87	11	203	
Total	**180**	**7**	**15**	**235**	**141**	**290**	**151**	**146**	**156**	**57**	**75**	**70**	**73**	**1596**	**314**	**2289**	**1**
% struck	*11.3*	*0.4*	*0.9*	*14.7*	*8.8*	*18.2*	*9.5*	*9.1*	*9.8*	*3.6*	*4.7*	*4.4*	*4.6*	*100*			

it was preferentially selected; it certainly would have been easy to identify due to its distinctive cortex.

Most of the remaining pieces are made from angular thermally fractured nodules that have a thicker, unrolled and less weathered cortex. They do suffer from thermal faulting, but their size would have permitted better platform creation and allowed greater control over flaking. They may have been obtained from superficial deposits close to the parent chalk, the closest sources of which lie *c.*15km to the north-west or a similar distance to the south-east of the site, although it is possible that similar cobbles could have been found, at least in localised patches, within Pleistocene deposits closer to Brentford. Even if available locally, their use may indicate that a greater degree of effort was expended in locating and selecting them as their qualities were appreciated. Coming from much further afield, however, are a number of flakes that have been struck from a ground implement of opaque grey 'stony' flint and a single flake struck from a ground greenstone implement (see below, Axeheads).

Dating

The typological composition of the struck flint indicates that flint-working commenced at the site during the Mesolithic period, although the bulk of it is likely to have been produced during the Early Neolithic.

Potentially the earliest pieces include a small group of blades that exceed 70mm in length which are notably longer than the rest of the assemblage. The longest of these measures 78mm in length and has been struck from a core that had been crested (Fig 9.9). The size of these pieces suggests that their raw materials did not derive from the local gravel terraces (see below), although it is perhaps more likely that they were brought to the site rather than actually being made here. Whilst this group does not include any truly diagnostic pieces, their size hints at the possibility that they date to the earlier Mesolithic (*c.*9600–*c.*7600 BC) or perhaps to the end of the preceding Devensian stage of the Pleistocene.

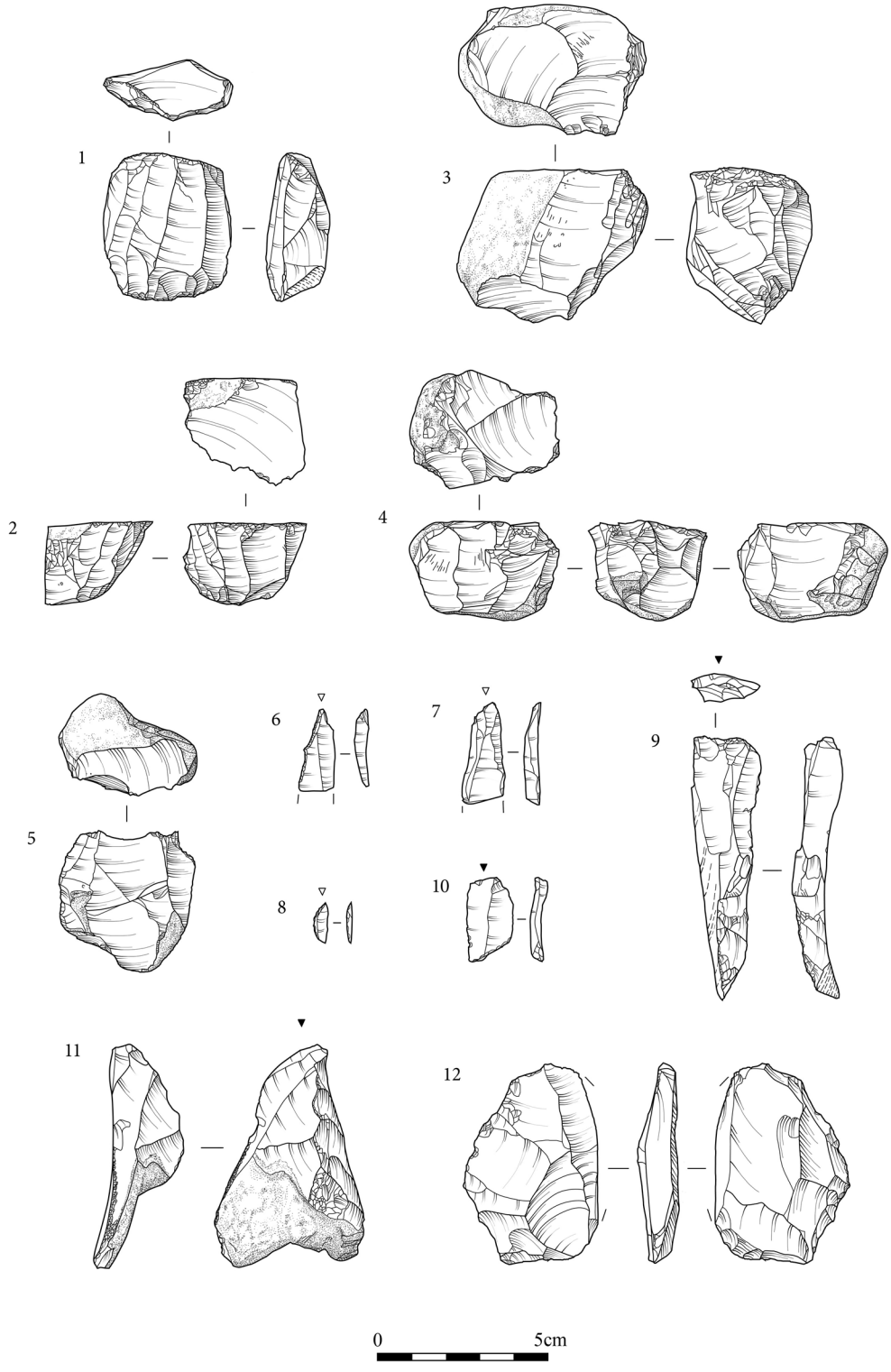
Secure evidence of Mesolithic activity is provided by a small group of microliths and micro-burins that can be dated to the later Mesolithic period (*c.*7600–*c.*4100 BC) (*eg* Figs, 9.6, 7 & 8). Further retouched pieces that are more characteristic of Mesolithic rather than later industries include a number of truncated blades and a few of the more systematically-reduced cores (*eg* Figs 9.1, 2 & 10). These are described in more detail below.

Technology

The technological strategies used during the Mesolithic and Early Neolithic periods are closely related and metrical analyses demonstrate an underlying homogeneity in the production of stone tools across the transition (Pitts 1978a; 1978b; Pitts & Jacobi 1979). However, techniques of working do show subtle changes (Edmonds 1987; 1995) and whilst the assemblage here can be broadly characterised as blade-based it is possible to detect some variation in the approaches evident in its manufacture.

Taken as a whole, the assemblage does appear to represent a mix of related, but divergent approaches to reduction. At one end of this scale is the truly systematic production of blades, involving the careful preparation and maintenance of cores that allows the repeated production of standard shaped and sized prismatic blades and which is perhaps most closely associated with Mesolithic technologies. At the other end there is a more casual, perhaps even less skilful, approach to reduction that also involves the production of substantial quantities of prismatic blades but, with less emphasis being placed on core preparation, thicker blades with an irregular dorsal scar pattern are produced in greater proportions. Alongside blade production, cores are also worked in order to deliberately produce flakes in a wide variety of shapes and sizes.

It is to this end of the scale that the bulk of this assemblage belongs, and this can be more closely related to the decline in systematic blade production that has been noted in Early Neolithic technologies, particularly those dating to the latter part of that period. Such a decline in, or at least less reliance being placed upon, systematic working can be seen in the lithic assemblages from a number of other Early Neolithic sites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in south-eastern Britain (*eg* Clark *et al* 1960; Healey & Robertson-Mackay 1987; Ford & Pine 2003; Beadsmoore 2006; Cotton 2008; Bishop & Proctor 2011; Cotton *et al* 2011).

Nevertheless, whilst change is apparent there remains considerable overlap between Mesolithic and Early Neolithic assemblages and the latter appears to be a development of the former rather than a completely new way of working. Factors such as raw material availability and quality also play an important part in determining the specific approaches adopted, as does the range of skills present amongst individual knappers and also the intended uses for which the flint-work has been created and the contexts in which it was produced.

As the bulk of the flint-work, including most of the diagnostically Mesolithic pieces, come from features dated to the Early Neolithic period it is impossible to confidently separate the assemblages from the two periods. The general characteristics of the assemblage as a whole will therefore be considered first and this will be followed by a more chronologically based description of the assemblages from the individual features.

Composition

The assemblage represents the whole knapping sequence and includes all stages from the initial selection and testing of raw materials to the discard of used retouched implements.

Micro-Debitage

Of the 1,596 pieces of struck flint recovered from the site, 235 pieces consist of chips, here defined as flakes less than 15mm in maximum dimension, and a further 156 pieces comprise unclassifiable flake fragments that also measure less than 15mm. These diminutive pieces contribute almost a quarter of the total assemblage and together are referred to below as micro-debitage.

Small flakes and pieces of shatter are generated in considerable numbers during reduction, from the deliberate trimming of cores and the retouching of flakes and blades, and also accidentally as by-products generated during the detaching of larger flakes. Their recovery is largely determined by the sieving programme, as it results in considerably higher numbers being recovered than during hand excavation. To a large extent this is reflected in the quantities that were recovered from features here. As can be seen in Table 3, the prehistoric features that were comprehensively sampled produced high proportions of micro-debitage, whilst less intensive sampling was conducted on the later contexts and these consequently produced far fewer small pieces. Small flakes and pieces of shatter are produced in vast quantities during knapping, not least within blade-based technologies where a high degree of core preparation and maintenance is undertaken. At the extensively sampled Mesolithic site at Woodbridge Road in Guildford for example, micro-debitage accounted for nearly 90% of an assemblage that totalled over 50,000 pieces (Bishop 2008). Although large quantities of micro-debitage were recovered at Kew Bridge Road, there are significantly fewer pieces present than might be expected if knapping had occurred *in situ* and directly into any of the features.

Flakes and Blades

Flakes account for nearly 90% of the total assemblage, with cores and conchoidally fractured fragments making up the remainder. Of the flakes, 18% are of blade dimension, in that they are at least twice as long as wide, this rising to 25% if the micro-debitage is excluded. The generally small size of the raw materials and their frequent thermal flaws has limited the size of the flakes and blades that could be produced.

Fig 9. (opposite) The lithics. Key: 1. Opposed platformed 'front' type blade core [281]; 2. Two platformed 'front and base' type blade core [285]; 3. Multiplatformed flake core [286]; 4. Single platformed 'front and sides' type narrow flake core [353]; 5. Single platformed 'front' type flake core [317]; 6. Microlith: obliquely truncated point [289]; 7. Microlith: obliquely truncated point [384]; 8. Microlith: micro-crescent [346]; 9) large crested blade [323]; 10. Truncated blade [281]; 11. Abraded edge implement [360]; 12. Laurel leaf [189], possibly broken during manufacture (scale 1:2)

The longest blade is 78mm in length (Fig 9.9) but most are significantly smaller and the complete examples average just 29mm in length. Similarly, very few flakes exceed 40mm in maximum dimension and the majority are under 30mm in length and less than 20mm wide.

The majority of the flakes and blades are waste pieces, generated during the preparation and maintenance of cores. Excluding micro-debitage, just under a fifth comprises decortication flakes, these having cortex that covers over half of their dorsal surface. Core preparation is also indicated by a small number of flakes and blades that have been crested, a technique undertaken to facilitate repeated blade production. A concern with maintaining the productive capacity of cores is demonstrated by the presence of core rejuvenation flakes. These include flakes removing most of, or the entire striking platform (core-tablets), plunged blades that are struck to rejuvenate opposed platformed cores and a variety of other flakes designed to remove problems arising on the core face, such as severe hinge scars. Crested and core rejuvenation flakes are closely associated with systematic blade production, Although some are present they are not common, respectively accounting for just over 0.5% and 1% of the assemblage even when excluding the micro-debitage, suggesting that these techniques were not routinely practiced. Instead, it is perhaps more likely that they predominantly belong with the Mesolithic material.

Flakes that appear to have been struck in order to further shape, remodel or maintain the core have been termed core modification flakes and these contribute 141 pieces or just under 12% of the overall assemblage, if pieces less than 15mm are excluded. Technologically these represent a very disparate group, but all have been interpreted as attempts at modelling the core and maintaining its ability to produce flakes or blades. They include flakes removed to shape and prepare the core, those struck to maintain its suitability for continued reduction, such as by removing bowing or developing flaws, and also those struck to re-shape the core and form new striking platforms on cores that have already been partially reduced. Many may also represent 'mis-hits' where the flake detached in ways other than those intended by the knapper. This may be due to a lack of skill or carelessness, but in many cases it probably reflects the poor quality of the raw materials. This can be seen by the high frequency of flakes with 'stepped' distal terminations, detached prematurely due to thermal flaws, or 'siret' flakes that split laterally along flaws.

The remaining flakes and blades are considered to represent the intended products of reduction and are either at least potentially useable or have been retouched to make formal tools. These potentially useable pieces comprise flakes, blades and flakes that have blade-like traits such as parallel dorsal scars. Together these contribute just over a third of the total assemblage excluding the micro-debitage, with retouched pieces contributing a further 7%. The flakes vary considerably in shape and size. Most are narrow and over a third are of blade proportions, of which the majority have parallel dorsal scars and lateral margins. There is also evidence for the deliberate manufacture of wider and thicker flakes. This probably reflects the varying needs and goals of the flint knappers and the wide range of tools required. Blades were reserved for certain implements, including the serrates, piercers and most of the edge retouched implements, but thicker and more sturdy flakes were needed for other implement types, such as the denticulates and scrapers.

Technological attributes of the flakes, such as pronounced bulbs of percussion and wide striking platforms with cracked points of percussion, indicate that in most cases cores were decorticated and modified with the use of hard hammer percussion. A prevalence of diffuse bulbs of percussion and narrow, often edge trimmed, striking platforms indicate that soft hammers were employed more frequently during the production of the potentially useable flakes and blades.

Cores

A total of 57 cores were recovered, representing 3.6% of the total assemblage or 4.7% including the micro-debitage. Conchoidally fractured chunks, most of which represent fragments of cores that disintegrated during reduction, contribute a further 4.7% of

the overall assemblage which rises to 6.2% without the micro-debitage. Also present are a large number of shattered cobbles which comprise angular fragments with mostly thermally fractured surfaces but also retain at least some evidence of conchoidal fracture. This indicates that although the fracturing occurred predominantly along pre-existing thermal flaws, it was initiated by the cobbles having been struck with some force. That this occurred at the same time that the rest of the assemblage was created is indicated by the thermal fractures having sharp surfaces, contrasting with the rounded and often recorticated surfaces present on the natural flint cobbles of the area. Whilst some could have been created fortuitously, such as during the original digging of the features, it is likely that most represent the initial testing of raw materials which consequently failed, and testify to the thermally flawed nature of most of the raw materials used at the site.

Despite many being only minimally reduced, the complete cores range from 11g to 208g in weight, averaging only 50g and none measure over 80mm in maximum dimension. A small number have very carefully prepared platforms and are systematically reduced, providing long sequences of blades, and it is thought that these are more likely to belong to the Mesolithic period. The great majority of cores, however, are typical of Early Neolithic industries and reflect a wide range of approaches to obtaining flakes.

Although reduction was often hampered by the poor qualities of the raw materials, flake and blade production was usually successful with nearly half of the cores having produced at least some blades or narrow flakes. The shape of the cores varies considerably; domed, lenticular, wedge shaped and globular examples were all recorded, but most are either irregular or largely retain the original shape of the raw material. Core preparation appears rather perfunctory with only minimal evidence for fashioning 'ideal' core shapes that would permit a greater degree of subsequent manipulation and in most cases core morphology was clearly not an important concern for the knappers. Striking-platform edges are frequently trimmed to some degree but the striking platforms themselves are rarely modified. The few flakes with facetted or dihedral striking platforms were possibly removed from keeled cores. The cores' scar morphology suggested the routine use of both hard and soft hammer percussion.

The expediency evident in their reduction partially reflects the limitations of the raw materials but also the need to produce the wide range of flake types required for turning into tools. As such, they defy close categorisation but the broad approaches taken to reduction can be discerned (Table 4). Just over half have a single platform, either created by removing a single flake from a cobble and using the scar of this as the platform to detach further flakes, but often just using unmodified cortical surfaces (Fig 9.5). Flakes were mostly detached from the 'front' of a cobble, but sometimes the platform was extended with flakes removed from the base, sides or even back of the core (Figs 9.1, 2 & 4). A further third of the cores have three or more platforms, sometimes using the faces of old platforms to detach further flakes, but more often by simply creating completely new platforms on different parts of the cobble (Fig 9.3).

This simple approach to reduction often failed and many of the cores have only been minimally worked, being abandoned as flaws or other deficiencies in the raw materials became apparent. Many have

Table 4. Classification of complete cores

Platform type	**Single**	**Two opposed**	**Two at right angles**	**Multiplatform**	**Keeled platforms**
Clark *et al* (1960) type	A2	B1	B3	C	D
Blade/narrow flake cores	18	2	1	7	
Flake cores	14		1	12	2

undeveloped Hertzian cones from failed attempts at removing further flakes and the high numbers of conchoidal chunks show that many disintegrated during reduction. Pragmatism in reduction was at least partly necessitated by the thermally flawed nature of many of the raw materials as demonstrated by the continued working of fragments of shattered cores.

Taken together, the cores are comparable to those recovered from the causewayed enclosure at Staines. There the most common type, accounting for over 50% of all cores, was those with a single platform that 'had been relatively casually flaked, the majority having an average of only six flakes struck from them; large areas remain on the surface of the nodules ... and only a few cores ... have been systematically flaked down to exhaustion' (Healey & Robertson-Mackay 1987, 96). They can also be closely compared to the cores from many of the other Early Neolithic assemblages from the region, including at the Shepperton ring-ditch where most consisted of alluvial cobbles that had been only minimally and relatively unsystematically reduced using single platforms (Cotton 2008, 42).

Retouched Implements

Retouched implements, heavily edge-worn flakes and blades and the by-products of tool manufacture, such as micro-burins and burin spalls, form 4.6% of the overall assemblage which rises to 6.1% when the micro-debitage is excluded (Table 5).

The proportion of retouched implements is comparable, although slightly higher, to the 4.2% recovered from the Shepperton ring-ditch (Cotton 2008, table 5) and is closer to the 6–7% recovered from the Horton ring-ditch (Ford & Pine 2003, 29) and 7–8 % recorded at the Staines causewayed enclosure (Healy & Robertson-Mackay 1987, 97).

At least some of the retouched pieces belong to the Mesolithic period. However, these include the microliths and micro-burins, which are diagnostic products of this period, as well as the truncated blades which are rarely encountered after the Mesolithic and have been associated with the manufacture of microlithic armatures. Burins, an example of which is represented by a characteristic burin-spall, are also more commonly encountered in Mesolithic assemblages. The only diagnostic Early Neolithic implement is a Laurel leaf point (Fig 9.12) although flakes struck from the ground flint and greenstone axeheads also indicate that these Neolithic implements were used, at least as sources of raw material. However, most of the retouched pieces simply cannot with any certainly be separated into either Mesolithic or Early Neolithic material.

Table 5. Quantification of retouched implements

Type	No.	% of all Retouched
Abraded edge implement	1	1.4
Burin spall	1	1.4
Denticulated flake	4	5.5
Edge retouched blade	11	15.1
Edge retouched flake	11	15.1
Laurel leaf	1	1.4
Micro-burin	3	4.1
Microlith	4	5.5
Notch	2	2.7
Piercer	2	2.7
Serrated blade	12	16.4
Short-end scraper	5	6.8
Long-end scraper	4	5.5
Side scraper	6	8.2
Truncated blade	5	6.8
Unclassifiable retouched fragment	1	1.4
Total	**73**	**100**

Abraded Edge Implement

A single chopping implement, consisting of a large core rejuvenation flake that has extensive battering and abrasion along one edge, was recovered (Fig 9.11). This is comparable to examples from the Staines causewayed enclosure and was almost certainly used as a heavy-duty chopping or grinding tool.

Axeheads

No axeheads are present, but a single flake of fine-grained laminated greyish green stone with a ground dorsal surface was re-used as a

raw material and when complete represented an implement, almost certainly an axehead. Without petrological analysis it cannot be definitively sourced, but it is macroscopically comparable to the epidotised tuff (Group VI) that has its principal source in the central fells of the Cumbrian Lake District, although a north Welsh origin is also possible. Quarries in these locations produced axeheads in considerable quantities during the Neolithic (Bradley & Edmonds 1993), many of which found their way to southern Britain and large numbers have been recovered from the Thames (Adkins & Jackson 1978).

Also present are a small number of flakes that have been struck from one or more ground implements made of a 'stony' opaque grey flint. This resembles the porcelain-like 'Lincolnshire Wolds' flint, nodules of which can also be found in the boulder clays of East Anglia, and which was commonly utilised for the manufacture of axeheads during the Neolithic period (Healy 1988, 33; Bishop forthcoming).

Edge Retouched Implements

The simple edge retouched implements comprise the most common type and are mostly made using blades or narrow flakes. The extent of modification is variable although it nearly always focuses on the longer, lateral, margins. It ranges from being limited to short lengths of the edge to encompassing most of the perimeter of the flake, and from being straight, convex or concave to sinuous.

In most cases the modification clearly consists of very fine retouching, which is either abrupt and lightly blunts the edge, allowing it to be safely handled or even hafted, or is slightly invasive and helps strengthen an already acute edge. A few may represent worn-down serrates and in most cases it is likely that the flakes and blades were used as fine cutting tools. With some, it is not clear whether the modification was deliberately executed or consists of micro-chipping formed through utilising the flake as a cutting implement (*eg* Tringham *et al* 1974).

Burins

Burins are represented by a single burin spall that has been struck longitudinally off a large flake or blade. There is also a large crested blade that has a few very small burin-like scars taken from its proximal end, although it is possible that this is incidental damage. These implements are most commonly associated with Mesolithic or earlier industries but continued to be made in small numbers into the Neolithic, they are generally thought to have been used for graving and are particularly associated with antler and bone working (although see Barton *et al* 1996 for other possible uses).

Denticulates

Four denticulates were recovered; all were made using relatively large flakes that measure between 40mm and 55mm in length and 27mm to 45mm wide. The denticulations vary from being small regular notches cut along one side of the flakes and at least superficially resembling saws, to having a few larger flakes removed, creating a sharp jagged edge. One has extensively retouched distal and proximal ends, which may have been intended as an aid to hafting.

Laurel Leaf

A single laurel leaf point was recovered. It has been bifacial worked but is broken, this failure possibly occurring during production (Fig 9.12). These are diagnostic Early Neolithic implements and although often referred to as 'points', it is more likely that they were used as elaborate knives.

Notches

Two notches were identified. One comprised a wide flake with a shallow notch cut into its side, comparable to 'concave scrapers'. The other is a prismatic blade that has been deeply notched near its distal end, causing it to snap off, which may represent an attempt at micro-burination.

Piercers

Two piercers are present; both made using prismatic blades. They both also have minimal retouch accentuating and strengthening their naturally converging distal ends and forming sharp needle-like points.

Microliths and Micro-Burins

Four microliths were recovered, a rod, a small crescent (Fig 9.8) and two obliquely

truncated points (Figs 9.6 & 7). The rod and crescent are both characteristic of Later Mesolithic industries. The remaining two are obliquely truncated points that are technically microliths as they have their proximal ends truncated, but their overall shape may suggest that they could had been used for purposes other than projectile points. Complementing these are three micro-burins which are waste products associated with the manufacture of microliths although in some cases they may have been re-employed as tools (*eg* Donahue 2002).

Scrapers

Scrapers form the second most frequent category of tools. All have steep convex working edges although their morphology and the nature of their retouch are variable. They also vary in size and include large sturdy flakes, finely retouched blades and, in one case, a reused core rejuvenation flake. Interestingly, five out of the fifteen scrapers are burnt, a far higher proportion of thermal damage than seen in the assemblage as a whole.

Scrapers are traditionally regarded as implements used to process hides and it is entirely possible that some or many of those recorded here were used as such. Nevertheless, ethnographic and experimental work has shown that, as with many tool types, scrapers may have been used for a variety of different tasks, including cutting, graving, chopping and even as projectile points; sometimes the same tool may even have been used for different purposes at different times (Odell 1981; Andrefsky 1998).

Serrated Blades

Serrated pieces are the third most common type present. These are all made on blades, eight of the twelve being prismatic examples. All but one have serrations along only one of the lateral margins, the opposite margin often being cortical, blunted or naturally steep, allowing for the blade to be safely held or easily hafted. The remaining serrate consists of a large broken blade that has serrations along both margins and a retouched proximal end. The seven complete examples vary from 33mm to 57mm in length and 10mm to 25mm in width.

Serrates are commonly associated with plant processing, particularly the harvesting of silica-rich plants such as cereals or reeds and rushes. None of the ones present here show any convincing evidence of 'sickle gloss', the distinctive bright polishing caused by processing silica-rich plants, but most are worn although the degree to which this has happened does vary. A role in plant processing has been largely confirmed by use-wear experiments conducted on Mesolithic assemblages. At Hengistbury Head, serrates (called there micro-denticulates) were used to cut or saw soft plant material (Levi-Sala 1992), and at both Thatcham in Berkshire and the B&Q site in Southwark they show evidence of having been used for processing plants (Grace 1992; Donahue 2002, 84–5). This may have included stripping the fibre from plants to make cordage and textiles (Juel Jensen 1994; Hurcombe 2007).

Truncated Blades

Five truncated blades were recovered; these comprise three with oblique truncations and two that are transversely truncated (*eg* Fig 9.10). All were made using prismatic blades; the four complete examples vary from 23mm to 30mm in length and from 11mm to 20mm in width.

Truncated pieces are commonly found within Mesolithic tool inventories; they formed the most common retouched type (after microliths) at Charlwood and Woodbridge Road in Guildford (Ellaby 2004; Bishop 2008). At the former site it was suggested that 'a number of these may be argued to fall into the category of boring and piercing tools' (Ellaby 2004, 20). Complementing the probable use of many of the microliths as projectile points, it has also been suggested that backed and truncated blades may have been used in the manufacture of arrow shafts (R Jacobi, pers comm).

Burnt Stone

All of the unworked burnt stone consisted of flint although relatively high proportions of the struck flint assemblage as well as the quernstone fragment had also been burnt. Where identifiable, the unworked burnt flints appeared to consist of rounded alluvial cobbles similar to those used to manufacture most of the struck assemblage. The degree

Table 6. Quantification of lithic material from Palaeochannel [298] and pits [379] and [385]

Feature	Decortication flakes	Core rejuvenation flake	Chip: flakes >15mm	Core modification flakes	Flake fragment >15mm	Flake fragment <15mm	Prismatic blade	Blade-like flake	Microlith	Micro-burin	Context total	Burntstone (no.)	Burntstone (wt:g)
Channel 298 1st fill			2		1		1				4	1	2
Channel 298 2nd fill			2			1	2				5	3	94
Channel 298 3rd fill	1			1		2	2				6	1	6
Total	**1**		**4**	**1**	**1**	**3**	**5**				**15**	**5**	**102**
Pit 379	1		1			1		1		1	5		
Pit 385									1		1		

of burning varied from limited thermal damage to severe with the latter being the most common, resulting in the flint becoming 'fire crazed' and changing to a greyish white colour. This would be entirely consistent with the flint having been in close proximity to a hearth. No indications of *in-situ* burning or for the locations of hearths were forthcoming, however, and this material most probably represents dumps of hearth waste.

Distribution

Phase 1: Mesolithic Activity

The stratigraphically earliest features at the site that produced struck flint consist of a palaeochannel [298] and two pits, [379] and [385] (Table 6).

The assemblages from these features are not large but all of the pieces are in a good condition. Along with a small quantity of core trimming micro-debitage, the assemblage from the palaeochannel is dominated by systematically produced prismatic blades, one of which may have been utilised. It also contained a small quantity of unworked burnt flint, indicating the presence of a hearth nearby. It appears that this material represents an episode of flint-working carried out adjacent to the palaeochannel during the Mesolithic period.

Pit [379] contained a micro-burin plus a blade-like flake and micro-debitage from core trimming, whilst pit [385] contained only a single struck flint, this comprising one of the obliquely truncated microliths. Both the micro-burin and microlith are diagnostic Mesolithic pieces and in the absence of any Early Neolithic pottery, it is possible that these features are contemporary with their associated flint-work.

Phase 2: Early Neolithic Ditch Sequence

Ditch [371] only contained relatively small quantities of struck flint, amounting to 18 pieces, and its probable extension [386] contributed a further four pieces. They both also produced small quantities of unworked burnt flints.

Three of the four struck pieces from ditch [371] consisted of micro-debitage, the remainder comprised an edge-retouched prismatic blade which may pre-date the feature (Table 7). Ditch [373] produced 18 struck pieces, mostly from its upper fill. These include a plunged blade that removed part of the striking platform from an opposed platform blade core and may also pre-date the feature. The only actual core from this feature came from the upper fill and consists of a large flake, possibly part of a disintegrated core that has a single flake removed from its ventral surface. A flake struck from a ground implement of 'Lincolnshire Wolds' flint was also recovered from this feature, this being of a very similar type to those present in ditch [318] and

Table 7. Quantification of lithic material from Ditch [371]/ [386]

Ditch Section	Decortication flakes and blades	Core Rejuvenation Flake	Chip: flakes >15mm	Core modification flakes	Flake fragment >15mm	Flake fragment <15mm	Useable flake	Prismatic blade	Blade-like flake	Retouched	Core	Total struck	Burnt stone (no.)	Burnt stone (wt:g)
371			2			1				1		4	3	4
386 Lower fill	2						2				1	5	1	17
386 Upper fill	1	1	1	2	1	3	2		2			13	2	27

quite likely to have been struck from the same implement.

Ditch [318] is the later of the Phase 2 features and contained by far the largest quantities of struck flint (Table 8). This was spread throughout its fills, the highest quantity coming from its uppermost fill, but the second highest being from its primary fill, suggesting that the flints entered the ditch either gradually as it was infilled or as a series of deliberate deposits. The quantities of burnt flint entering the ditch decreased as it infilled however. There are no significant differences apparent in the flint-work from the different fills and its somewhat variable condition suggests that it came from a larger accumulation of knapping debris.

The flint-work includes a relatively high proportion of systematically produced prismatic blades and blade-like flakes, which could possibly be residual from earlier activity at the site, and this is possibility supported

Table 8. Quantification of lithic material from Ditch [318]

Context	Decortication flakes and blades	Crested flakes and blades	Chip: flakes >15mm	Core modification flakes and blades	Flake fragment >15mm	Flake fragment <15mm	Useable flake	Non-prismatic blade	Prismatic blade	Blade-like flake	Retouched	Core	Conchoidal chunk	Shattered cobbles	Context total	Burnt stone (no.)	Burnt stone (wt:g)
Primary fill	9	2	3	3	8	5	10		9	1	4	2	2	7	65	14	171
Middle fill	1	1		1	4		6	1	1	2	1	3	3	4	28	6	54
Upper fill	10		5	9	4	3	18	1	10	5	4	6	9	10	94	4	23
Total	**20**	**3**	**8**	**13**	**16**	**8**	**34**	**2**	**20**	**8**	**9**	**11**	**14**	**21**	**187**	**24**	**248**
%	*10.7*	*1.6*	*4.3*	*7.0*	*8.6*	*4.3*	*18.2*	*1.1*	*10.7*	*4.3*	*4.8*	*5.9*	*7.5*	*11.2*	*100*		
% >5mm	*11.7*	*1.8*		*7.6*	*9.4*		*19.9*	*1.2*	*11.7*	*4.7*	*5.3*	*6.4*	*8.2*	*12.3*			

by the presence of an obliquely truncated microlith that can be dated to the Mesolithic from the ditch's primary fill. A large possible blade that had been transversely truncated may also belong to this earlier period of flint-working. The remaining retouched pieces all consist of scrapers or serrates and other simple edge-retouched implements, which can only be broadly dated to either the Mesolithic or Early Neolithic periods.

Of certain Neolithic date are a number of flakes that retain traces of polishing on their distal faces, the similarities in the flint suggesting they may have come from the working-down of a single ground implement. These were recovered from the middle and upper fills of the ditch. Also found in these fills are a further five flakes, two from the middle and three from the upper, that are made from the same type of flint. These do not retain any traces of polish, although they are likely to have come from the internal parts of the same implement. None of these flakes can be made to refit, however.

The cores from the ditch are disparate and whilst two of the 11 had produced blades or narrow flakes, none had been systematically worked. This ditch also contained a high proportion of conchoidally shattered cobbles that most likely represent failed attempts at working the local alluvial cobbles.

Phase 3: Early Neolithic Reorganisation of Ditches

The two main features of Phase 3, ditches [272]/[361] and [341]/[355], contained the largest assemblages from the site, together accounting for nearly three quarters of the struck flints and two thirds of the fragments of unworked burnt stone. The assemblages are comparable to each other and contain pieces from all stages in the reduction sequence. The material mostly comprises knapping waste, but also many potentially useable pieces as well as discarded retouched implements, which make up 5.1% and 4.6% of the material from ditch [272]/[361] and [341]/[355] respectively, rising to 6.5% and 6.2% if the micro-debitage is excluded. The retouched inventories of both features are equally varied and the general composition of the assemblages from the two features is also broadly similar.

The condition of these two ditch assemblages was also very similar, with around three-quarters of the pieces showing some evidence of edge chipping or abrasion. The degree of damage, whilst somewhat variable, is mostly very light, suggestive of limited 'trampling' and being knocked together, such as may occur during knapping or redeposition. However, whilst both assemblages contain relatively high proportions of burnt struck pieces, they account for only just over 10% of the assemblage from ditch [272]/[361], over 25% of that from ditch [341]/[355].

Ditch [272] and its presumed extension [361] produced the largest quantities of lithic material recovered from any of the features, consisting of over half of the struck flints and nearly half of the unworked burnt flints (Table 9). Additionally, a burnt fragment of siliceous 'bunter' or sarsen sandstone weighing 210g was recovered from the upper fill of [317]. This has a slightly dished smooth facet which may represent a fragment from a saddle quern. The lower fill produced a bright white quartzite pebble which shows no evidence of modification, although its striking appearance may have caught attention resulting in it being collected and brought to the site. Struck flints were present throughout the fills of the features, but it was unevenly distributed. In ditch [272] the largest quantities of flints came from the second spit in the southern end, but in the northern end the largest quantity came from the primary fill. Conversely, the primary fill of ditch [361] contained only a single small flake fragment, but 67 pieces, including five retouched implements were recovered from its upper fill. The basic 'technological signature' of the material from the different fills is broadly similar, although some 'clustering' of types may again suggest that assemblage consists of selections of flint-work with slightly different compositions, the retouched component from fill [319] being dominated by serrated blades for example. The retouched inventory is varied and includes examples of most of the types identified from the site. Some residual material is also indicated by the presence of a microlith and a micro-burin.

The largest quantity of unworked burnt flints came from the upper fill of section [361], but this is mainly due to the presence of a single large burnt cobble. Other than

Table 9. Quantification of lithic material from Ditch [272]/[361]

Section	Fill	Decortication flakes	Crested flake	Core rejuvenation flakes	Chip: flakes >15mm	Core modification flakes	Flake fragment >15mm	Flake fragment <15mm	Useable flake	Non-prismatic blade	Prismatic blade	Blade-like flake	Retouched	Core	Conchoidal chunk	Shattered cobbles	Total	Burnt stone (no.)	Burnt stone (wt:g)
361	lower fill							1									1		
361	upper fill	12			2	10	5	1	12	2			5	3	3	12	67	3	47
272 N	lower fill	11		1	40	14	20	17	26	9	8	7	10	4	5	5	177	22	683
272 N	upper fill	8		1	14	3	8	2	5	3	3	1	3	2	1	1	55	13	56
272 S	spit 1	11	2	1	17	15	9	10	18	4	5	6	7	5	9	6	125	22	70
272 S	spit 2	32	1	2	19	21	26	13	33	11	16	11	8	9	12	9	223	31	189
272 S	spit 3	12		1	12	11	11	8	10	4	6	3	8	3	3	5	97	1	7
272 S	spit 4	11			13	7	3	14	11	2	4	2	1	3	3	6	80	25	89
Total		**97**	**3**	**6**	**117**	**81**	**82**	**66**	**115**	**35**	**42**	**30**	**42**	**29**	**36**	**44**	**825**	**117**	**1141**
% All		*11.8*	*0.4*	*0.7*	*14.2*	*9.8*	*9.9*	*8.0*	*13.9*	*4.2*	*5.1*	*3.6*	*5.1*	*3.5*	*4.4*	*5.3*	*100*		
% >15mm		*15.1*	*0.5*	*0.9*		*12.6*	*12.8*		*17.9*	*5.5*	*6.5*	*4.7*	*6.5*	*4.5*	*5.6*	*6.9*	*100*		

this, only relatively small quantities were present in the ditch, although its distribution does form a similar pattern to that of the struck flints.

Ditch [341]/[355] provided the second largest assemblages of both struck flints and unworked burnt flints from the site (Table 10). As with the main section of ditch [272], this material was concentrated within the second spit with significant quantities present in the third and fourth spits. The condition, raw materials and technological

Table 10. Quantification of lithic material from Ditch [341]/[355]

Cut	Fill	Decortication flakes	Crested blade	Core rejuvenation flake	Chip: flakes >15mm	Core modification flakes	Flake fragment >15mm	Flake fragment <15mm	Useable flake	Non-prismatic blade	Prismatic blade	Blade-like flake	Retouched	Core	Conchoidal chunk	Shattered cobbles	Context total	Burnt stone (no.)	Burnt stone (wt:g)
355		1			6	4		8	3				1	3	2		28	10	145
341	spit 1				5	1	1	2		1		1	1	1			13	7	8
341	spit 2	17		3	13	13	17	5	18	4	3	7	5	3	9	2	119	32	122
341	spit 3	11		1	16	3	11	12	12		2	6	2	5	4	2	87	34	38
341	spit 4	11	1	2	10	10	8	11	16	8	5	3	7		4		96	5	39
341	spit 5											1		1	1		3		
Total		**40**	**1**	**6**	**50**	**31**	**37**	**38**	**49**	**13**	**10**	**18**	**16**	**13**	**20**	**4**	**346**	**88**	**352**
% All		*11.6*	*0.3*	*1.7*	*14.5*	*9.0*	*10.7*	*11.0*	*14.2*	*3.8*	*2.9*	*5.2*	*4.6*	*3.8*	*5.8*	*1.2*	*100*		
% >15mm		*15.5*	*0.4*	*2.3*		*12.0*	*14.3*		*19.0*	*5.0*	*3.9*	*7.0*	*6.2*	*5.0*	*7.8*	*1.6*	*100*		

Table 11. Quantification of lithic material from Feature [339] and ditches [373] and [375]

Feature	Decortication flakes	Chip: flakes >15mm	Core modification flakes	Flake fragment >15mm	Flake fragment <15mm	Useable flake	Non-prismatic blade	Prismatic blade	Retouched	Shattered cobbles	Context total	Burnt stone (no.)	Burnt stone (wt:g)
F339			1			1		1		1	4	5	84
D373		2			3	1		1	1		8	6	51
D375	2		1	2			1				6	3	18

make-up of the assemblage was very similar to the one recovered from ditch [272]/[361] and although no pieces could be refitted between the ditches, it is entirely possible that the flint-work from these two ditches was obtained from the same source.

As with ditch [272]/[361], the retouched inventory is varied and includes examples of most of the types identified on site. Some residual material is also indicated by the presence of a microlith and a micro-burin. A flake struck from a flint ground implement very similar to those from the Phase 2 ditch [318] is probably another residual find.

Three other features assigned to Phase 3, cut [339] and ditches [373] and [375] contained only small quantities of struck flints and unworked burnt flints (Table 11). The struck flints are broadly similar to the assemblages recovered from the other features, but no diagnostic pieces were present and the only retouched implement consisted of a coarsely denticulated flake. Most of the pieces displayed some degree of chipping or abrasion and whilst this is not heavy, the assemblage is most plausibly interpreted as residually deposited (see discussion below).

Phase 4: Prehistoric Settlement

Ninety pieces of struck flint and small quantity of unworked burnt flint were recovered from 26 of the features assigned to Phase 4, but none produced more than two pieces that measure 15mm or more in maximum diameter (Table 3). Overall the Phase 4 assemblage is dominated by pieces of micro-debitage, which account for over 80% of the total. Other than this preponderance of micro-debitage, the assemblage is blade-based and essentially indistinguishable from those of the earlier phases, and it is likely to be of a similar date and origin. The only notable piece is the laurel leaf, a diagnostic Early Neolithic tool, which was found in linear feature [190].

The high quantities of micro-debitage is indicative of knapping occurring in the vicinity, but there is no means of knowing how much of this may have been associated with the use of the features rather than having had been redeposited from the earlier features through which these cut.

Post-Prehistoric Deposits

The remainder of the lithic assemblage comprises eighty-seven pieces of struck flint and just over 200g of unworked burnt flint, which were recovered from features and deposits ranging from the Roman to the modern period, the struck flint at least being evidently residually deposited (see Table 3). The assemblage is again predominantly blade-based and very similar to those recovered from the Phase 2 and 3 features. There is nothing to suggest any of it post-dates the Early Neolithic, although the possibility that a few pieces belong to later prehistoric flint-working traditions cannot be entirely excluded. The most interesting piece is a small flake found in ditch [348] that has been struck from a greenstone ground implement derived from northern or western Britain, with the Cumbrian Fells perhaps being the most likely source. Ground axeheads can be dated to the Neolithic

period, many complete examples have been found in south-eastern Britain. A single retouched implement was also recovered, this comprising a large side scraper that can only be broadly dated to the prehistoric period, but which is not unlike others found in the Phase 2 and 3 features.

Summary and Discussion

Mesolithic Flint-Working

The small assemblage of flint-work recovered from the palaeochannel and two adjacent pits, along with some residually deposited material, can be confidently dated to the Mesolithic period. This includes microliths, micro-burins and a few other tools characteristic of this period. It represents activity carried out adjacent to the channel, which in addition to the manufacture or repair of microlithic equipment also involved the use of hearths. A few particularly large blades are comparable with examples found in Uxbridge and it is possible that activity may have commenced by the earlier Mesolithic or even the very end of Devensian stage of the Pleistocene (Lewis & Rackham 2011). Other microlith types attest to later Mesolithic activity and together the flint-work indicates repeated visiting of the site prior to the Neolithic. Similar small scatters of flint-work, thought to represent short-lived campsites of transient groups, have been identified at numerous locations within the London region, often adjacent to the Thames, its tributaries or other water courses (*eg* MoLAS 2000, inset map 2). Just across Brentford High Street at the Gasworks site, scatters of struck flint included microliths and micro-burins similar to those recovered here and comparable flint-work has been found at a number of locations along the High Street between Kew Bridge and the confluence of the Brent (Macdonald 1976, 21; Canham 1978a; Parnum & Cotton 1983; Bishop 2000; 2002). Additionally, major concentrations of Mesolithic tranchet axeheads have been recovered from around Kew Bridge (Field 1989, fig 7; Lacaille 1961 & 1966).

It is worth noting that the vast array of Mesolithic material culture recovered from the margin of Lake Flixton in North Yorkshire at Star Carr, including over 16,000 worked flints, has been subject to various interpretations due largely to uncertainties regarding its depositional environment. Initially the Star Carr assemblage was interpreted as the detritus from a lakeside camp site that accumulated through a combination of *in-situ* accidental loss and causal disposal. Subsequently, it has been argued that this assemblage was waste discarded into standing water and that elements of it may represent:

> deliberate and purposeful deposition; which might have formed part of ritual practices carried out following a successful red deer hunt. Analysis of the 2004–15 fieldwork concluded 'that there was no single context of deposition at Star Carr, nor were artefacts deposited in a uniform manner or through the results of a common set of practices. Instead, the *ad hoc* loss and disposal of material through day to day tasks occurred alongside more structured patterns of artefact deposition suggesting that apparently ritual behaviour was in fact part of the daily lives of the people who inhabited Star Carr' (Taylor *et al* 2017, 22–5, 39).

These conclusions have implications for the interpretation of Mesolithic sites like Kew Bridge.

Early Neolithic Flint-Working

The bulk of the struck flints probably date to the Early Neolithic. This assemblage can be regarded as large by regional standards and is probably the largest Early Neolithic assemblage recovered from Greater London. Cores were being gathered and worked here, as shown by the frequency of minimally reduced examples and quantities of shattered cobbles that suggest raw materials were being tested. These were not available in the immediate environs but probably obtained from very close by, such as the banks or floor of the Thames which is located *c.* 50m to the south. A wide range of tools was also being produced, used and discarded and these presumably reflect the undertaking of an equally wide range of activities.

This material can be characterised as the product of a competently undertaken blade and narrow flake industry. Blade-based reduction is a defining feature of the Early

Neolithic industries of the 4th millennium BC, but technological developments within that period remain poorly understood. This assemblage gives some insight into these problems; the simplicity in core working in conjunction with a lack of standardisation in blade production sets it apart from the latest Mesolithic and earliest Neolithic industries (*eg* Bishop 2008; Bishop & Proctor 2011). If a more-or-less gradual decline from blade to flake production during the 4th millennium BC is assumed, this assemblage would be compatible with it belonging to a later phase within the broader Early Neolithic, and is entirely consistent with the middle to later 4th millennium BC date suggested for the pottery.

Most of the material came from three large ditches and in terms of broad composition, technological characteristics and raw material use, these assemblages are comparable. This is particularly so with ditches [272]/[361] and [341]/[355] which have been assigned to the same phase, whilst the assemblage from the earlier of these ditches, [318], does show some differences. There are higher proportions of systematically produced blades for example, which suggest that this ditch contained higher proportions of residual material from the Mesolithic.

There is no evidence for any *in-situ* flint-working within the ditches; there are few refitting sequences and only a small proportion of the total quantities of flint-working debris that must have been generated is present. Additionally, the assemblages are varied in condition with a high degree of fragmentation and burnt and unburnt pieces were found in close proximity. This would suggest that the assemblages from the different fills and features had been gathered from one or more larger accumulations of knapping debris, such as middens, and that these had been exposed to the elements and other agencies, such as trampling and fire. Nevertheless, the lithic material did not appear to be completely randomly distributed within the ditches' fills; some short refitting sequences were identified and the presence of numerous small flakes and fragments suggest the material may have been deposited *en masse* within the soil matrix, along with the burnt flints and perhaps pottery. Within the different fills of the ditches some coherence within the material was noted, such as distinctive pieces of raw materials or the quantities and proportions of certain flake and tool types. This may indicate that either the ditches were infilled through a series of temporally discrete depositional episodes, or that the accumulations from which the material was gathered similarly varied in composition, perhaps having been built up over time through a range of settlement based activities. Such discard patterns mirror the selective disposal of material that appears to be an important factor in the infilling of pits on many Early Neolithic occupation sites (Healy 1988; Pollard 1999; Thomas 1999; Garrow 2006; Lamdin-Whymark 2008). The deposition of accumulated occupational detritus may have been intended as a symbolic gesture, a means of inscribing the landscape and perhaps intended to commemorate the settlement or the events that occurred there.

The general pattern of Early Neolithic occupation within Greater London appears to not radically change from the preceding Mesolithic, with most evidence in the lower Thames valley comprising small scatters of flint-work, usually located close to the Thames and its tributaries. These scatters probably represent the residues of relatively short-lived encampments occupied by mobile groups. This kind of evidence is well attested in the Brentford area, with Neolithic flint-work having been recovered, often from the same locations as Mesolithic material, along the river bank within the vicinity of Kew Bridge (see above, Archaeological Context). In most cases the flint-work is found in low densities with individual scatters comprising at most a few hundred pieces. Even the larger assemblages, such as the 3,000 or so pieces found at Sefton Street in Putney, were probably generated over a considerable period (Warren 1977).

The assemblage from Kew Bridge Road is comparable in terms of its knapping technology and raw material use to most of these small scatters but marks a departure in terms of its size and its apparent deliberate deposition within substantial features. The quantity of material present is notable and is indicative of a relatively intensive or prolonged episode of occupation involving a broad-based series of activities. In

these respects it can perhaps be most closely compared to the more-substantial assemblages recovered from a few of the Early Neolithic monuments known from the west London Thames. At the Staines causewayed enclosure over 24,000 struck flints were recovered from similar sized and shaped features to those at Kew Bridge Road, although the excavation there was far more extensive this density of struck flint is probably comparable (Healey & Robertson-Mackay 1987). The Shepperton ring-ditch yielded over 2,200 struck flints, apparently representing dumps of material from domestic type activities into its ditches (Cotton 2008). The ring-ditch at Horton produced a smaller but still substantial assemblage amounting to over 600 struck flints, interpreted as at least partially deliberately deposited occupational debris (Ford & Pine 2003). The ring-ditch at Ashford produced an even smaller assemblage amounting to 163 pieces, despite it being of comparable size to the Shepperton example, but it is perhaps significant that it contained very little in the way of material culture at all (Carew *et al* 2006). The assemblages from these monuments share similarities in many other respects to that from Kew Bridge Road. They all rely heavily on the use of poor-quality alluvial cobbles and employ comparable technological approaches to core reduction. All of the assemblages represent the complete knapping sequence from the processing of raw materials to the manufacture of retouched implements. There are some differences in the proportions of types present within these assemblages, which might reflect slight variations in the tasks being undertaken at the sites. Higher proportions of serrated implements and other tools made using systematically produced blades at Kew Bridge Road may represent higher rates of residual material.

Interestingly, at all of these sites with the exception of Horton, axeheads made from a non-local opaque grey flint were flaked down, whilst at Horton flakes from a ground greenstone axehead similar to that recovered from Kew Bridge were recovered. Whilst the working down of axeheads may represent an opportunistic use of proven raw materials, the fairly coarse grained nature of both the flint and the greenstone would make it unlikely that they were admired for their flaking abilities. It is perhaps more likely that the stone itself was seen as exotic and therefore held some prestigious value, with flakes struck from axeheads similarly retaining some cultural significance. Many ground axeheads have been dredged from the Thames and although seen as a key element of the Neolithic tool kit, they are rarely found within settlement sites. Instead, where contextual information is available, axeheads are most likely to be recovered from either monumental or ceremonial sites, where their deposition may have had held symbolic or ritual significance (Edmonds 1993; 1998).

The Animal Bones

Kevin Rielly

Prehistoric deposits revealed a total of nine hand collected animal bones (Table 12). Most of these bones were well preserved and minimally fragmented, the exceptions being one out of the two bones (a sheep/goat tibia) from the prehistoric linear feature [339], which was heavily abraded. Sampling was undertaken to recover fish bones (see Meddens below).

The Phase 2 material consisted of a cattle-size vertebra fragment from ditch [386]. The Phase 3 collection was taken from four linear cuts – ditches [341]/[355], [337] and [339] and linear feature [339], each producing no more than two fragments. The cattle bones, both from [341], represent extremely fragmented mandibular molars, possibly from the same mandible, while the sheep comprise a femur and two tibia

Table 12. Distribution of hand collected animal bones by phase

Phase	**2**	**3**	**4**
Species			
Cattle		2	
Cattle-size	1		
Sheep/goat		3	
Sheep-size		1	2
Total	**1**	**6**	**2**

fragments. As alluded to above, one of the sheep fragments, from linear feature [339] was poorly preserved. A sheep-size vertebra was recovered from the Phase 4 linear cut [216]. It should be noted that the good state of preservation of most of these bones may suggest a relatively late date for their deposition and the possibility that they are intrusive cannot be entirely excluded.

The Analysis of the Environmental Remains

Frank Meddens

Deposits across the site deemed to have the potential for preserving microscopic or macroscopic carbonised or other faunal and floral remains were extensively sampled and the samples recovered were processed and assessed by Pre-Construct Archaeology and Quaternary Scientific (University of Reading) using standard techniques and methods. Unfortunately, due to the acidic nature of the deposits, the results proved very limited with no remains suitable for archaeobotanical analysis being recovered. Very small fragments of fish bone were found in samples from the palaeochannel (Phase 1) and ditch [272]/[361] (Phase 3) as well as post-prehistoric deposits, although none of this material was identifiable to species level (P. Armitage, pers comm). The issue of contamination of some of the prehistoric deposits with later environmental and mineral materials also reduced their potential significance. Several of the Phase 4 contexts produced identifiable charcoal which was radiocarbon dated with the aim of providing a *terminus ante quem* date for the features and artefact assemblages. The dates obtained provided additional evidence for contamination with a post-medieval component and confirm that the sample results held little significance from an archaeobotanical perspective and similarly were of no relevance to the prehistoric part of the sequence for their dating potential.

Some of the Phase 2 and 3 contexts produced a black residue which was originally thought to represent charcoal fragments. Visual inspection of this material for the purpose of selecting samples for radiocarbon dating suggested that it included coal and clinker or possibly some other form of organic residue and is likely to represent post-medieval contamination. Further analysis was therefore carried out to establish its nature (see Badreshany below).

Scanning Electron Microscope Energy-Dispersive Spectroscopy (Sem-Eds) Analysis

Kamal Badreshany

Three of the samples taken from the prehistoric deposits produced small fragments between 2.5mm and 5mm in size. Most were of a highly vesicular or vitrified nature which the EDS (x-ray microanalysis) study indicated had a chemical profile indicative of clinker. There were also two fragments of unidentifiable diffuse porous but unmineralised charcoal, one of which was a tiny fragment of a charred hazelnut shell. A further fragment was identified as coal. The samples also produced a black powder which EDS analysis indicated had very high carbon (approximately 97%) and relatively high sulphur content (approximately 2%). This profile indicates that they were mainly composed of coal, although possibly mixed with charcoal and clinker. An additional fragment 75mm in size was very flat and had a platy texture, unlike any of the other samples. The EDS analysis yielded no carbon, but rather large amounts of aluminium and silicon. Lesser amounts of potassium, calcium, and iron were also found. Such an EDS spectrum is typical of clay minerals (Severin 2004, 127), allowing for the identification of the fragment as fired clay.

The usage of coal in London is known from the medieval period, and its consumption greatly increased during the post-medieval expansion and industrialisation of the capital (Galloway 1898, 63–278). Therefore, the contexts containing it are indicative of intrusive, post-medieval contamination.

DISCUSSION

The earliest evidence for human activity was Mesolithic flint-work recovered from fills of the palaeochannel and as residual material. Unworked burnt flint was also present, indicating that the Mesolithic activity involved the use of hearths. To the

east of the palaeochannel, two pits, the earliest deliberately cut features on site, also contained flint-work datable to the Mesolithic (Fig 3). Although evidence for the digging of pits during the Mesolithic remains uncommon, such features have been identified at an increasing number of sites in south-eastern England. At Woodford Road in Guildford, clusters of pits were associated with a dense later Mesolithic knapping scatter adjacent to the river (Bishop 2008) and at Charlwood and Bletchingley, also in Surrey, pits appear to have been excavated within and around working or living areas. It has even been suggested that these might represent the beginnings of an earthmoving tradition that develops into the causewayed enclosures of the Neolithic (Cotton 2004; Ellaby 2004; Jones 2013). Whatever the dating of these two pits, it is clear from the struck flints from the site that this particular location formed a focus for activities during the Mesolithic and complements the considerable number of contemporary finds that have been recovered from the Thames (see above, Archaeological Context). The site's location, adjacent to the Thames but on a relatively elevated aspect with good views along and across the river and adjacent to a stream flowing into the Thames, would have made it a prominent and desirable spot to early communities. At least some of the microliths can be dated to the later Mesolithic period, but there are some indications that earlier Mesolithic pieces are also present, suggesting that this location may have been repeatedly visited over a long period.

The Early Neolithic period saw a dramatic change in the nature of the activity on site: within the same area as the two Mesolithic pits a series of substantial linear ditches were dug (Fig 4). The pottery styles indicate that this change occurred during the mid-4th millennium BC (see above, Neolithic Pottery), indicating that they were dug sometime after the initial phases of the Neolithic within the London area (Whittle *et al* 2011). It also indicates a hiatus between this activity and the Mesolithic occupation, although it is entirely possible that the site was being visited sporadically throughout this time.

Following the silting up of the initial phase of ditches, a second cluster of similar features was dug on similar although not exact locations and alignments (Fig 5). The division of this activity into two phases is somewhat arbitrary, as the sequence of ditch construction is complex, although the second phase of activity does appear to represent a major episode of renewal and reorganisation. The finds also suggest some differences do exist between the phases. The quantities of both pottery and struck flint recovered from the Phase 2 ditch fills are smaller than those from Phase 3, and the pottery sherds are smaller and more abraded with fewer conjoining pieces. A suggested explanation for this is that the earlier ditches were backfilled over a longer period of time, indicating they were left open with their fills accumulating naturally. Conversely, the fills of the later features were seen to contain larger quantities of pottery and more instances of conjoining sherds from the same vessels. This suggests that the backfilling occurred rapidly and that the sherds had not had the opportunity to become as dispersed or weathered.

Owing to the severe truncation of the prehistoric deposits only small parts of any of the ditches were seen and consequently interpretation is difficult, as they extended beyond the limit of excavation. Their size is notable and this alone separates them from most Early Neolithic domestic settlement features, which typically comprise small scatters of pits and postholes (*eg* Thomas 1996). Instead they are more akin to the large monumental earthworks such as long barrows or enclosures known from this period, the presence of a gap in the Phase 3 ditches raising the possibility that they could represent remnants of a causewayed enclosure. This would certainly be consistent with the size of the ditches (*cf* Oswald *et al* 2001, fig. 3.8) and the date range for this type of monument would coincide with the mid-4th millennia BC date suggested for the pottery (Whittle *et al* 2011). Causewayed enclosures, as with other types of Neolithic monuments, can be found scattered across southern and eastern England; the nearest are both located close to the Thames, with Staines some 16km to the west and Orsett around 46km to the east (Hedges & Buckley 1978; Robertson-Mackay 1987). The evidence from site could also be reconciled with a range of other loosely defined, Neolithic

monument types, such as large ring-ditches or the hengiform, mortuary and other varieties of enclosure, examples of which have been identified on the gravel terraces to the west in the Heathrow area (*eg* Canham 1978b; Ford & Pine 2003; Carew *et al* 2006; Framework Archaeology 2006; 2010; Jones 2008; Chaffey *et al* 2013; Powell *et al* 2015).

The possibility that these ditches represent monumental earthworks, particularly a causewayed enclosure, is supported by the nature of the associated ceramic assemblage which is more closely paralleled with those from confirmed causewayed enclosures rather than with pottery groups from other types of Neolithic earthworks (see above, Neolithic Pottery; also Hedges & Buckley 1978; Robertson-Mackay 1987; Ford & Pine 2003; Framework Archaeology 2010). The proportions of retouched tools in the lithics assemblage (see above, Mesolithic and Neolithic Lithic Material) similarly compare to those recorded at Neolithic monumental sites such as the Shepperton ring-ditch (Cotton 2008, table 5), the Horton enclosure (Ford & Pine 2003, 29) and the Staines causewayed enclosure (Healy & Robertson-Mackay 1987, 97).

Following the final infilling of the ditches the nature of activity at the site took on a very different character (Fig 6). Within the vicinity of the infilled ditches clusters of small pits, postholes and stakeholes were recorded although no structural arrangements were discernible. Some of these features produced struck flint and Early Neolithic pottery of similar characteristics to that from the earlier ditches, although some of this may have been residual. It is noteworthy that causewayed and other Neolithic enclosures often contain scatters of pits and postholes that indicate occupation regularly occurred in and around them (Oswald *et al* 2011). In some cases, postholes were cut along the edges of the enclosures' ditches, possibly to act as revetments or even to facilitate their use as temporary shelters (*eg* Curwen 1936).

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