

## **10,000 years in the life of the river Wandle: excavations at the former Vinamul site, Butter Hill, Wallington**

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with contributions by  
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*Archaeological excavations alongside the river Wandle in Wallington produced evidence of the environmental history and human exploitation of the area. The recovery of a large assemblage of struck flint provided information on the nature of the prehistoric activities represented, while a detailed environmental archaeological programme permitted an examination of both the local sediment successions and thus an opportunity to reconstruct the environmental history of the site. The site revealed a complex sedimentary sequence deposited in riverine conditions, commencing during the early Holocene (from c 10,000 years before present) and continuing through the late Holocene (c last 3000 years). Large flint nodules were washed by the river onto the site where they were procured and worked by Mesolithic and Bronze Age communities. Potentially usable nodules had been tested, and suitable pieces completely reduced, while the majority of useful flakes and blades had been removed for use elsewhere. Small numbers of retouched pieces, such as scrapers and piercers, indicate that domestic activities took place nearby. By the Saxon period the site had begun to stabilise, although it remained marshy and probably peripheral to habitation. Two pits from this period were excavated, one of which contained an antler pick. A small quantity of cereal grain also suggests that cultivated land lay in the vicinity of the site. During the 19th century a mill race was dug across the site, redirecting water from the river Wandle, which resulted in episodic flooding.*

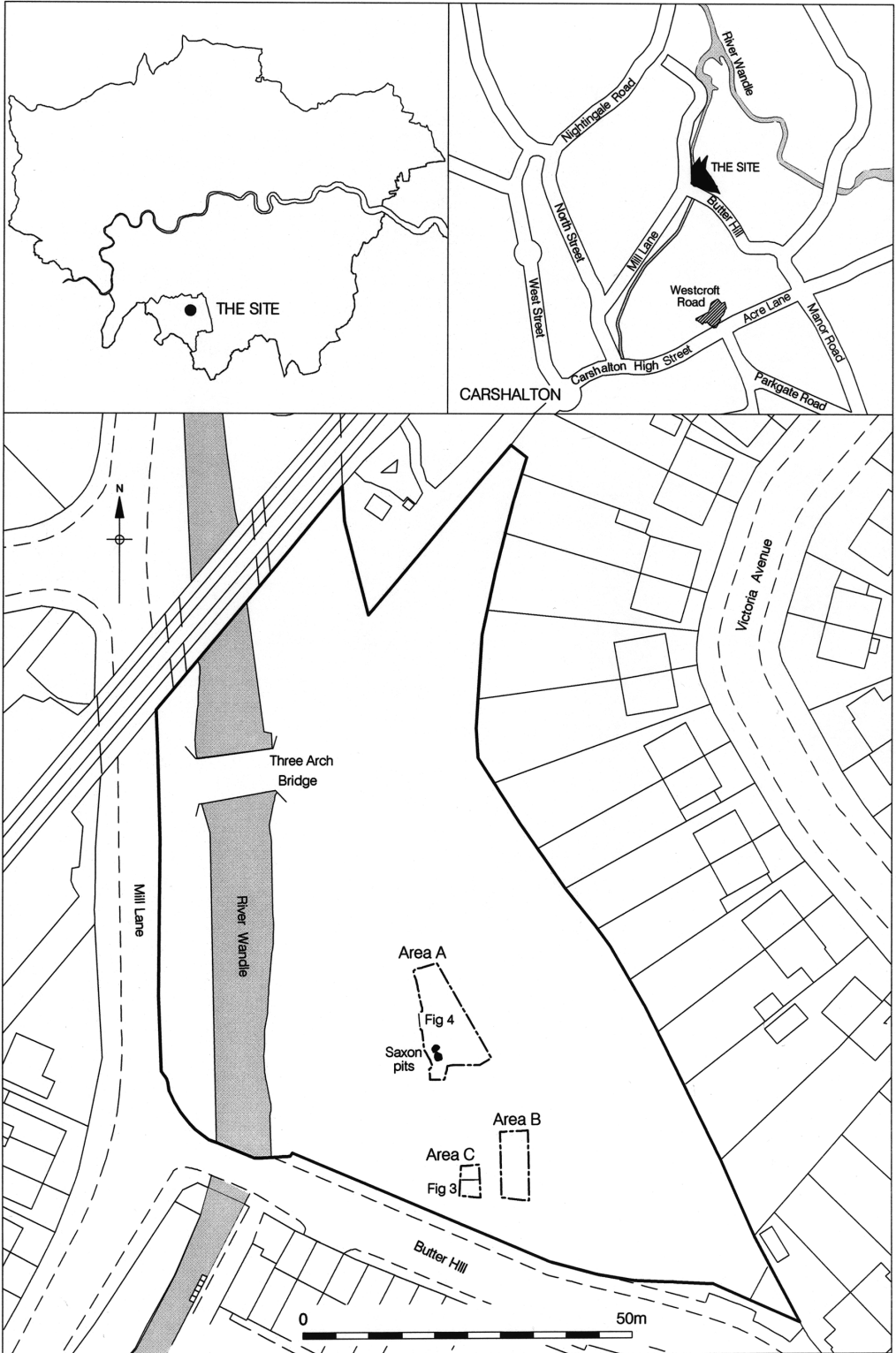
### **Introduction**

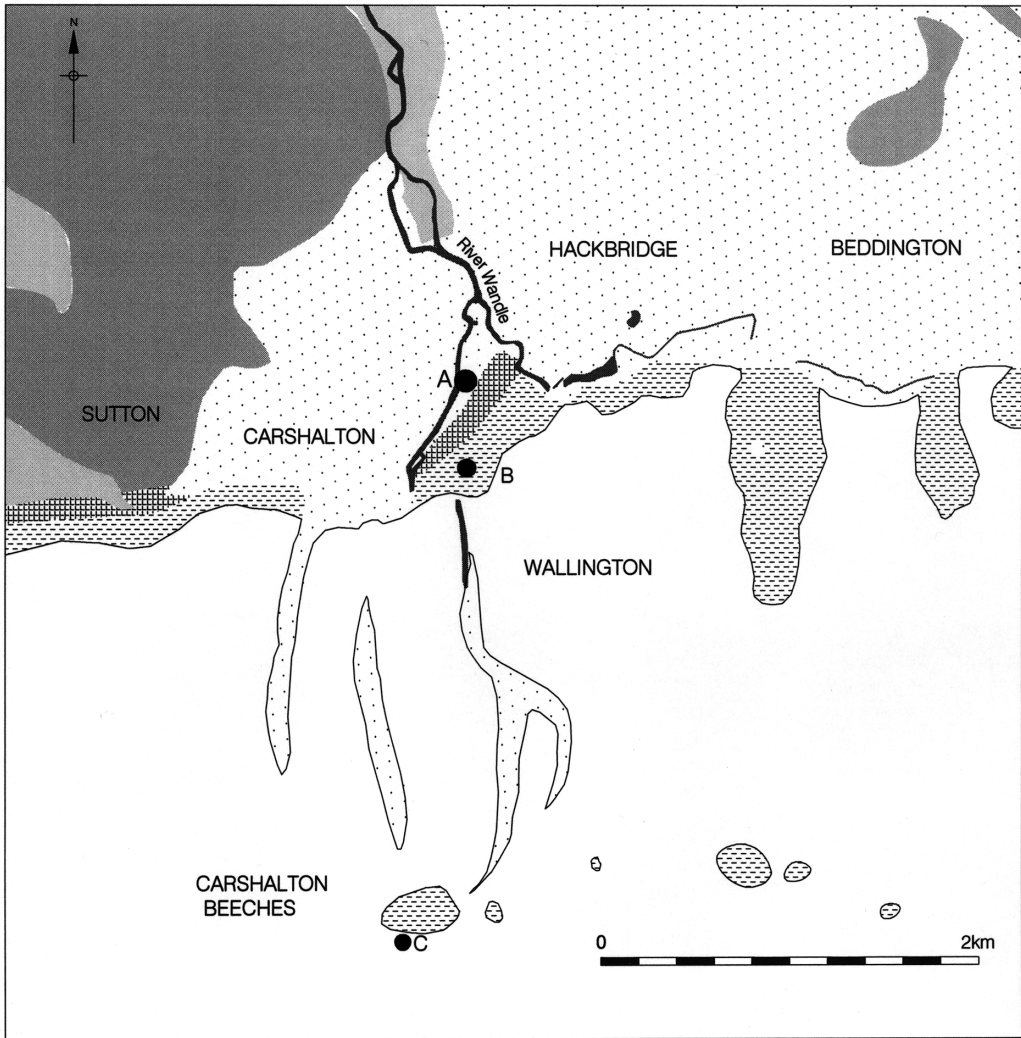
An archaeological investigation was carried out in 2001 by Pre-Construct Archaeology in advance of the redevelopment of the former Vinamul site (site code BTG01), Butter Hill, Wallington, in the London Borough of Sutton (fig 1; TQ 2825 6520). The initial investigations showed that much of the site had been damaged by modern activities and that it contained localised areas of toxic contamination. However, three areas were identified as having promising sedimentary sequences, and consequently an archaeological excavation followed, comprising trenches A, B and C. The mitigation strategy employed on the site allowed for only one-third of the prehistoric deposits to be excavated. The site lies within the relatively low-lying valley of the river Wandle, immediately to the east of the present course of the river, and the levels of the modern land surface fall steeply towards the river to the west.

### **The archaeological sequence**

#### THE EARLY HOLOCENE

The earliest deposits recorded during the excavations comprised olive grey consolidated clay, identified as redeposited London Clay (fig 2; fig 3, contexts 35 and 27), which was recorded at a height of between 26.04 and 26.85m OD. The pollen record from these contexts is characterised by high percentages of grass (Poaceae), pine (*Pinus*) and hazel (*Corylus* type). These pollen taxa suggest the presence of open pine woodland and hazel shrubland growing on nearby dryland. In wetter areas, the pollen record indicates the presence of open alder (*Alnus*) and willow (*Salix*) woodland (fig 7). Though not secured by independent dating, it is





SITES:	Alluvium	Woolwich and Reading Beds
A The Site	Thanet Sands	London Clay
B Westcroft Road	Unclassified Terraces	Upper Chalk
C Queen Mary's Hospital		

Fig 2 The former Vinamul site, Butter Hill, Wallington: sites referred to in the text in relation to geology. (© Crown copyright and/or database right. All rights reserved. Licence number 100014198)

highly likely that this pollen assemblage represents the general composition of early Holocene vegetation in the Wandle valley, an interpretation supported by recent studies in south-east England (Scaife 2000; Branch & Green 2004).

Fig 1 (opposite) The former Vinamul site, Butter Hill, Wallington: site location. (© Crown copyright and/or database right. All rights reserved. Licence number 100014198)

## MESOLITHIC AND BRONZE AGE ACTIVITY

Overlying the redeposited London Clay were layers of mixed pale yellow coarse sand and gravel (fig 3, contexts 31–34 and 22–23), interleaved with patches of sand and organic remains, the top of which was recorded between 26.59m and 27.01m OD. The presence of coarse as well as fine-grained mineral sediments indicates deposition within a fluvial environment, such as a meandering river, and represents the creation of point-bars, overbank deposits (levées, crevasse-splay and flood plain deposits) and abandoned channel fills. The sequence indicates that during the process of lateral channel movement and accretion, bar formation (gravel and sand) was succeeded by finer sediment deposition (silt and clay) under progressively lower energy conditions. These overbank deposits were deposited on top of the former channel and their nature indicates significant variations in water flow velocity during subsequent flood events. The sediments have occasional fragments of wood, representing either long-distance transportation of organic matter or *in-situ* deposition of detritus from plants growing within, or on the margins of, the river. A radiocarbon sample was taken from these fragments of wood and indicates that the sediments were deposited during the early Holocene (6450–6220 BC) (table 2: see *Endnote*), a date supported by the majority of the lithic material. Re-working of the deposits during the Middle and later Bronze Age is indicated by some of the flint assemblage, as well as the faunal and floral remains, which include domestic animals and some evidence for cereal cultivation.

Poor pollen concentration, as well as the preservation of only highly resistant grains and spores, such as lime (*Tilia*), may be attributed to physical destruction following on from the transition to higher-energy fluvial conditions. Nevertheless, the pollen taxa preserved in this part of the sequence indicate three distinct plant communities: open oak (*Quercus*) woodland with beech (*Fagus*), birch (*Betula*) and ash (*Fraxinus*) on dry land; alder-dominated wetland, supported by the identification of alder wood and plant macrofossils and mollusca (*Ranunculus* sp, eg buttercup, and *Vallonia* sp respectively); and grassland with tall and short herbs, such as species of the carrot and daisy families (Apiaceae and Lactuceae respectively), black knapweed (*Centaurea nigra*), and possibly charlock (*Sinapis* type), indicating the presence of meadow or pasture. There was also evidence for cereal cultivation, presumably the result of later prehistoric reworking.

These deposits were rich in struck flint, supplying over 90% of the total from the site. The vast majority of the pieces were in good condition, suggesting that most of the assemblage was recovered close to where it was originally discarded. Large flint nodules, weighing up to 4kg and deposited by the river, formed the raw materials used. The main activities to occur at the site consisted of the selection, preparation and reduction of the flint nodules. All stages in the reduction sequence were represented, including: failed ‘tested nodules’; primary preparation and decortication flakes; core mass reduction and shaping flakes; core rejuvenation, maintenance and small trimming flakes; shattered and exhausted cores. Finished tools and potentially usable blades, flakes and cores were under-represented, suggesting that although reduction was occurring the useful products were taken away for use elsewhere. Some other activities were represented by burins, scrapers and cutting implements, although these may have been subsidiary to the main tasks of flint production.

Most of the struck pieces from this phase consisted of a broadly contemporary industry of Mesolithic derivation, based on systematic blade production. The most diagnostic pieces of flint consisted of three microliths and a burin, characteristic of Later Mesolithic industries, while on-site microlith manufacture was confirmed by the presence of three microburins. The presence of tranchet axe-sharpening flakes also indicates axe maintenance occurring at the site. Other, less diagnostic tools, include scrapers of various morphologies, piercers and assorted forms of simple edge trimmed flakes and knives. Neolithic or Early Bronze Age lithic material was not identified (fig 11, nos 32–33), although some of the struck flint was the product of a crude and opportunistic reduction strategy, most characteristic of Middle Bronze Age and later industries. Some later material may therefore have been present, or this part

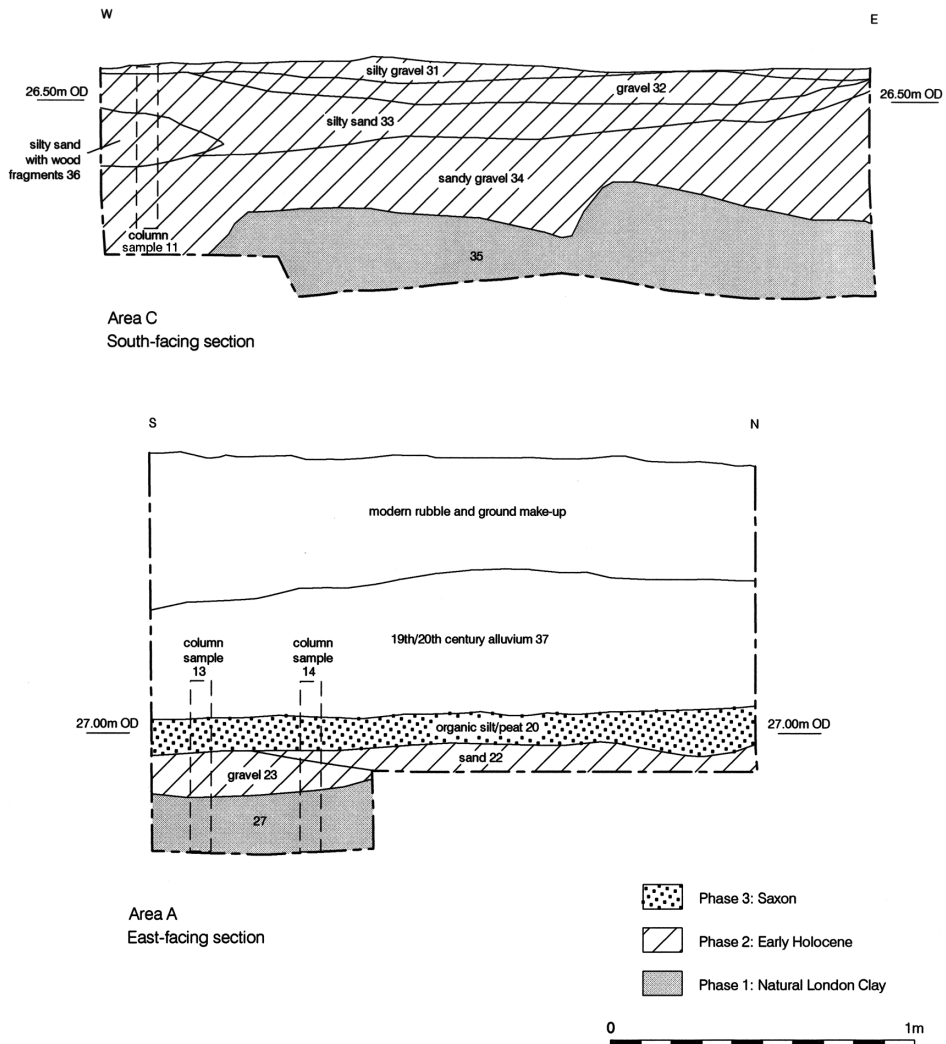


Fig 3 The former Vinamul site, Butter Hill, Wallington: south-facing section, Area C and east-facing section, Area A.

of the assemblage was the result of the poor quality of the available raw material. This suggests that the flintwork was the product of repeated visits throughout the Later Mesolithic, with a hiatus during the Neolithic and Early Bronze Age, and possibly small-scale activity resuming during the Middle and Late Bronze Age, making use of the undisturbed earlier flint deposits. The faunal remains further imply Bronze Age activity, and include domestic cattle and pig as well as red deer and horse, suggesting that both wild and domestic animals formed part of the subsistence base of the local economy.

#### LAND STABILISATION DURING THE LATER SAXON PERIOD

These deposits were sealed in Area A by a thin layer of dark grey clayey silt with organic detritus, mollusca and peat (fig 3, context 20), recorded at a highest level of 27.08m OD.

The accumulation of organic-rich (13%) sediments and peat represents both the deposition of *in-situ* organic material under waterlogged conditions and, at certain times, deposition of further mineral sediments (tables 1 and 3: see *Endnote*). The formation of semi-terrestrial conditions during this time points to flood plain stabilisation, and represents a significant change in the local environment. A radiocarbon date (table 2: see *Endnote*) obtained from this deposit indicates that this transition occurred during the Saxon period (AD 680–980). This date is supported by the recovery of a few sherds of shell-tempered pottery dating to the mid to late Saxon period, as well as a number of fragments of lava quernstone from the Mayen-Niedermendig area of the Eifel Hills region of Germany, commonly used in the Saxon period. The pollen data indicate the formation of sedge swamp (Cyperaceae) and reed swamp (eg *Phragmites*), with drier areas dominated by herbaceous taxa commonly found in grassland and waste places. The presence of a single grain of cereal pollen suggests cultivation in the immediate vicinity. The low arboreal pollen values, in particular oak (*Quercus*), lime (*Tilia*) and elm (*Ulmus*), and the presence of beech (*Fagus*) pollen (fig 7) are consistent with other late Holocene records from south-east England, and reflect both the extensive clearance of woodland by human groups (Scaife 2000; Branch & Green 2004) and the natural migration of certain woodland taxa into the British Isles during the last 2000 years.

#### SAXON PITTING ACTIVITY

Two shallow pits (fig 4, contexts 16 and 18), each measuring over 1m in diameter, were cut into the organic silt/peat layer (contexts 19 (not illustrated) and 20 (fig 3)). One of these contained four large flint cobbles, which had been deliberately struck at some point, while the other contained an antler pick from a large, mature red deer. The flint cobbles may be residual prehistoric tested nodules or later Saxon building material. The antler was almost certainly from a deer that had shed its antlers in the vicinity during the spring. The entire brow tine had been removed, as well as the trez tine and the crown; the end of the bez tine was clearly faceted for use as a pick, although the lack of wear on the bez tine or on the burr suggests that it had not been used. In prehistoric antler picks it is mostly the brow tine which

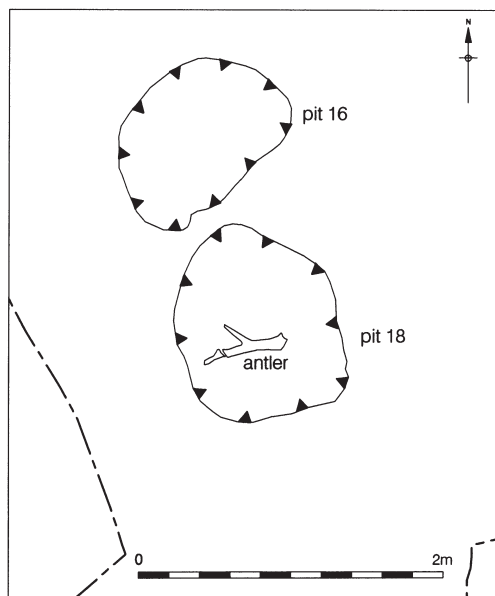


Fig 4 The former Vinamul site, Butter Hill, Wallington: Saxon pits

has been selected for the working end of the pick; examples using the bez tine though rare are known. Further along the tine an area had been smoothed with the aid of a blade, and there are two blade marks on the beam. The antler had been severed along a line running across the stub of the trez tine and the two separate sections placed firmly back together before being deposited within the pit. The pick, therefore, had been carefully manufactured but never used, before being chopped in two and placed within a pit with the two parts resting together; this suggests that the pick was not intended as a functional tool but may have had more of a symbolic role. This has clear parallels with Bronze Age activity, particularly the placed deposits at the nearby site of Westcroft Road (figs 1 and 2; Proctor 2002). A radiocarbon date obtained from the pick indicates that it had been shed between AD 770 and 1000 (table 2: see *Endnote*). These pits and their contents, therefore, remain enigmatic.

#### POST-MEDIEVAL ACTIVITY

A revetted water channel or leat (fig 5), running approximately north–south, truncated parts of the above sequence. Pottery recovered from the upper fill suggests a late 19th to mid-20th century date for the backfilling of the channel. These dates accord with the cartographic evidence, and the channel can be seen on the 1840 tithe map and subsequent OS maps until 1950 (fig 6), serving the corn mill to the south. Episodic flooding from this channel as well as from the river Wandle resulted in the deposition of a thick layer of clay and silts, and indicates changes in the hydrology of the river catchment. The presence of waterlogged seeds within this deposit of *Rubus* sp (eg bramble) and *Ranunculus* type (eg buttercup), and the mollusca *Vallonia* sp and *Cochlicopa* sp, indicate shrubland and marshland at the site.

## Finds

### THE LITHICS, by Barry John Bishop

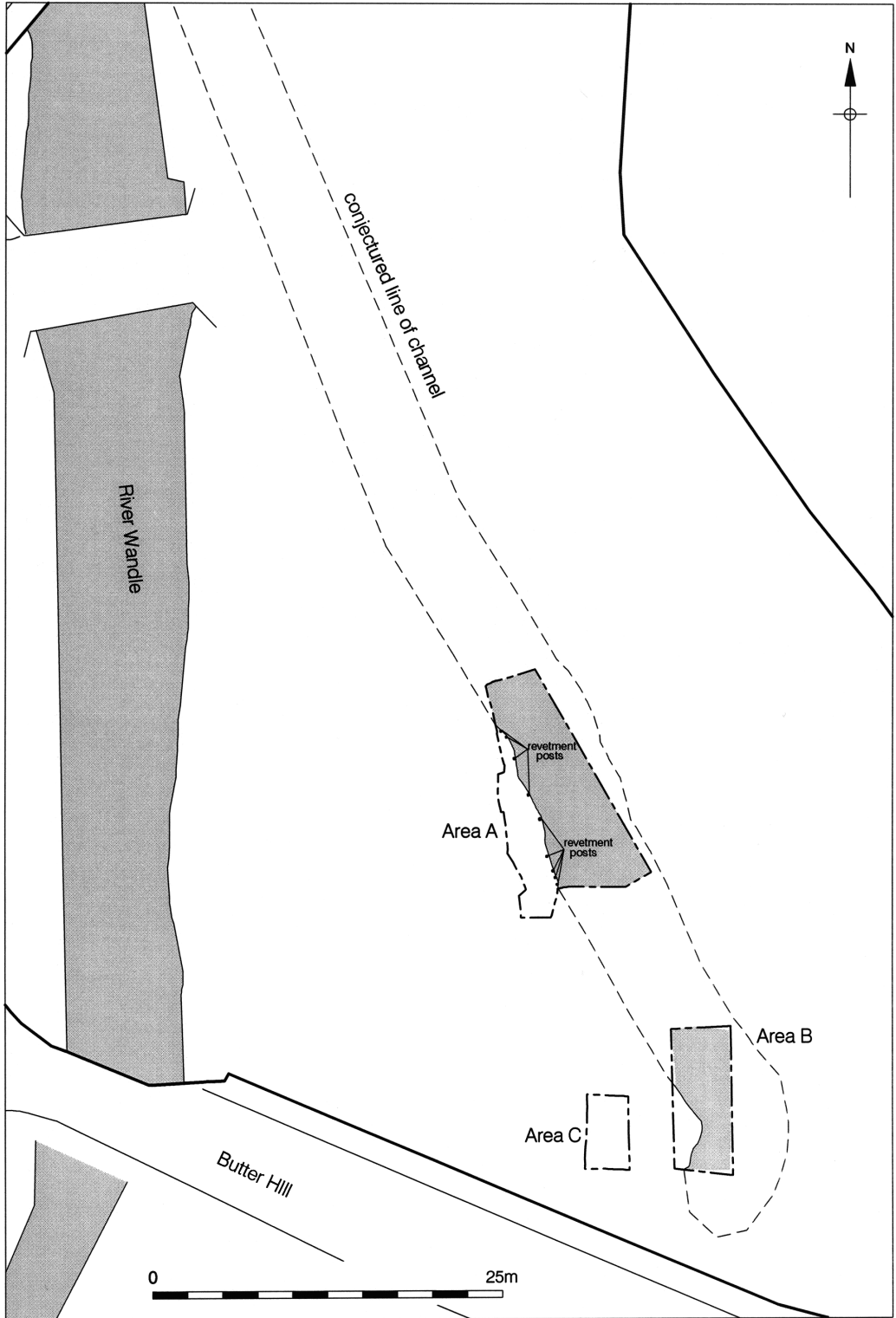
Excavations at the site produced 1126 pieces of struck flint and over 12kg of burnt flint predominantly from a series of alluvial units, a reasonably high density further emphasised by the fact that only about one-third of the observed deposits were actually excavated. The bulk of the assemblage was clearly the product of a blade-based technological strategy, the presence of microliths and microburins confirming a Mesolithic date (in this report blades are defined as flakes at least twice as long as wide and with approximately parallel lateral margins and dorsal scars).

Despite the recovery of numerous flint artefacts from the Wandle valley – both large assemblages and individual finds – few accounts have been published in the archaeological literature, and relatively little is known of the Mesolithic occupation of the area or the area's role in the wider patterns of landscape utilisation during this period. This is primarily due to the paucity of analytical work undertaken on recovered assemblages, as well as the general lack of stratigraphy or radiometric dates associated with this material. This report attempts a start at remedying this situation, and presents a detailed description of the lithic assemblages found at the Butter Hill site and a discussion of the nature of the activities represented, to allow inter-site comparisons and aid the much needed synthesis of the local archaeology.

### *Assemblage description*

#### Stratigraphy and context

The bulk of the assemblage (90%) was recovered from a sequence of alluvial units deposited within a meandering stream bed. Several of these units contained struck and burnt flint, although over 80% of the assemblage was recovered from a single unit (layer 23), which was





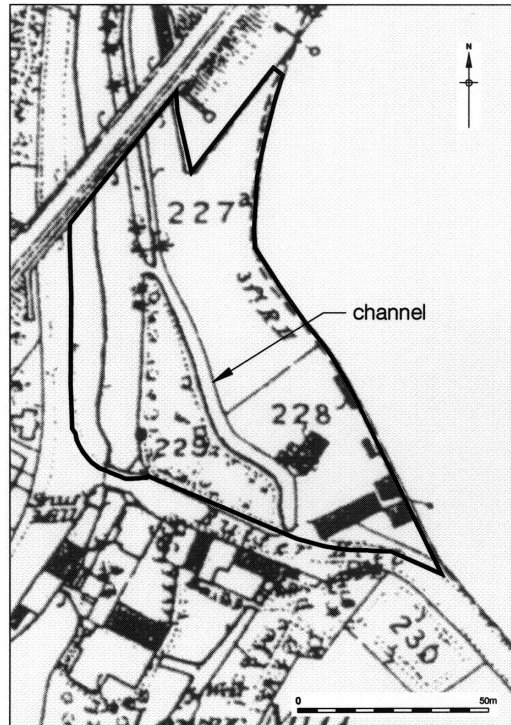


Fig 6 The former Vinamul site, Butter Hill, Wallington: the channel on the 1865-7 OS map.

a thin accumulation of sands and gravels. The remainder of the assemblage was recovered from overlying peat and other deposits, datable to the historic period, and evidently redeposited from the alluvial units.

Radiocarbon dating indicated that the alluvial sequence began to form by the early Holocene, while pollen evidence suggests that alluvial deposition and reworking continued throughout later prehistoric periods. No features were identified within the alluvial deposits although over 9kg of burnt flint was recovered from them. No specific concentrations that could have indicated the presence of hearths were recognised, and it is uncertain, as with the struck material, whether the burnt flint had entered the stream through erosion or had simply been discarded into it.

#### Raw material

The raw materials were naturally present within the alluvial units and consisted of thermally scarred nodular flint cobbles with a weathered chalky cortex of variable thickness weighing up to 4kg. Only limited evidence of alluvial abrasion to the nodules was apparent, with battering confined mostly to nodular protuberances, although they had evidently been brought downstream by alluvial and/or colluvial processes from the chalk that outcrops to the south of the site. The flint was translucent black in colour and contained frequent light grey or, more rarely, light yellow cherty patches, typical of North Downs flint. Some of the nodules had a distinctive greenish glauconitic cortex with an underlying orange band,

Fig 5 (opposite) The former Vinamul site, Butter Hill, Wallington: post-medieval channel.

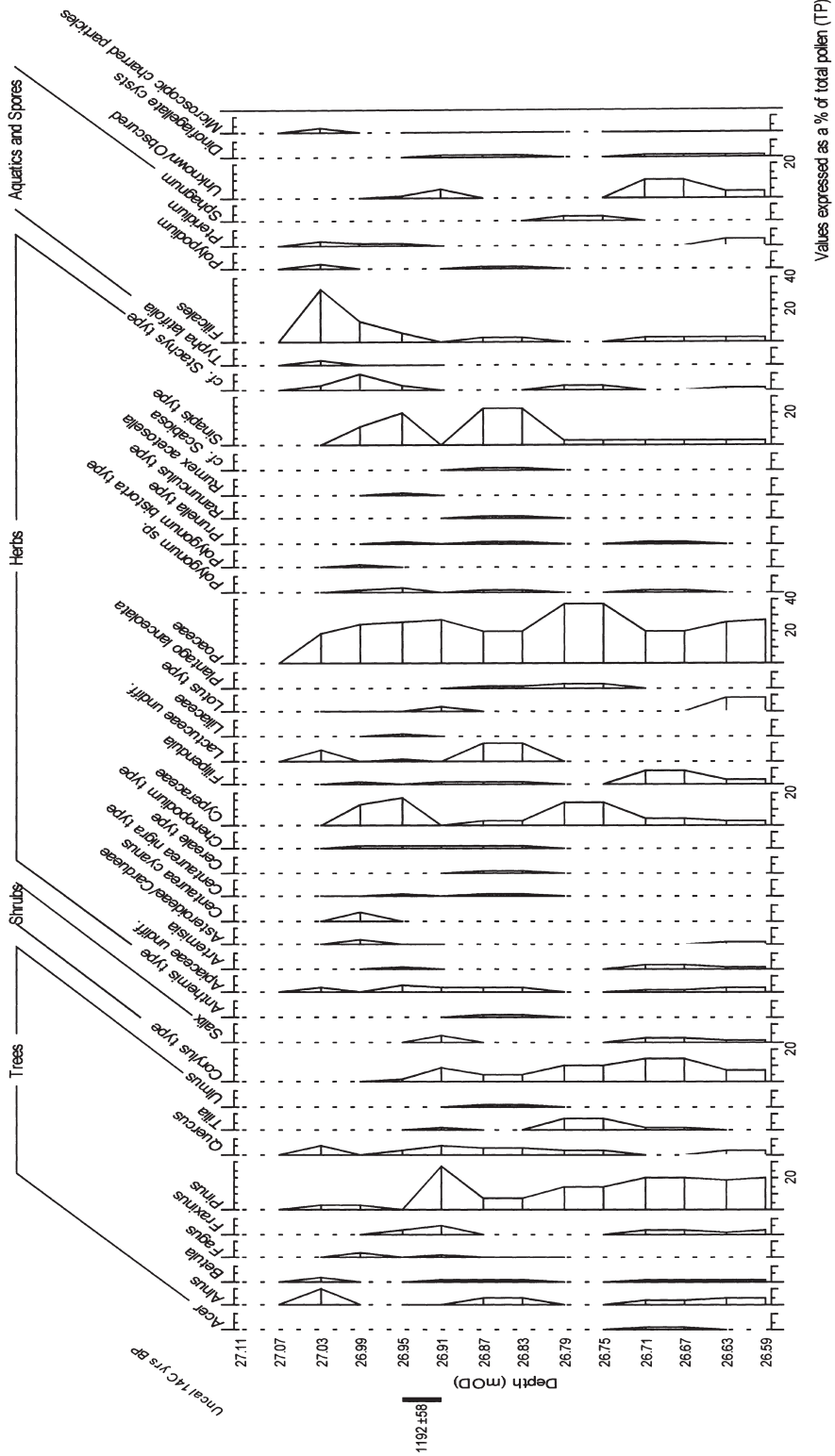


Fig 7 The former Vinamul site, Butter Hill, Wallington: pollen diagram.

characteristic of 'Bullhead Bed' flint, found at the junction of the chalk and overlying Tertiary deposits (Shepherd 1972).

The struck flint had not recorticated to any appreciable degree but many struck pieces were stained a dark opaque grey and were frequently coated with a hard calcareous deposit, comparable to 'Thames Race'.

### Condition

The condition of the struck assemblage was somewhat variable, although the vast majority of the assemblages from the alluvial deposits were either in good condition or only exhibited slight chipping to thinner edges. Some slight polishing to arêtes, flake edges and surfaces was also noted, consistent with some movement within the burial matrix.

The condition of the assemblage as a whole would indicate that it had experienced some abrasion, presumably through alluvial scouring and resorting of the sediment, although the presence of thin flakes in virtually pristine condition would suggest that this was limited.

Owing to the reworking of the burial matrix, it cannot be demonstrated whether the assemblage was the product of a single occupation or a palimpsest of repeated visits. There was little doubt that the bulk of the assemblage was of Mesolithic date, but as no diagnostically later pieces were identified it was difficult to ascertain whether any mixing had in fact occurred and, if so, what the extent of this might have been. Some flakes and cores indicative of a rather crude reduction style were present; these may simply represent the earlier stages of a blade-based reduction strategy and reflect the limitations of the raw material. Nevertheless, it would be impossible to distinguish these pieces from those originating from cruder, more opportunistic technological strategies, such as those characteristic of the Middle Bronze Age and later, and the presence at the site of domestic animal bone suggests some mixing was entirely possible. Conversely, the general technological homogeneity of the assemblage argues against extensive mixing, suggesting that at least the bulk of the assemblage was the product of either a single occupation or a series of closely associated visits, such as through consecutive seasonal use.

### Quantification

Owing to the mitigation strategy, the assemblage was hand recovered and no sieving was employed, consequently relatively few very small flakes or flake fragments were retrieved. Nevertheless, all stages in the reduction sequence were clearly present, including large

Table 4 Composition of the assemblage

	No	%
Tested nodules	27	2.4
Decortication/core shaping flakes	287	25.5
Crested blades/flakes	2	0.2
Cores	64	5.7
Chunks	50	4.4
Core maintenance/modification flakes	143	12.7
Chips (< 15mm max dimension)	9	0.8
Platform rejuvenation flakes	24	2.1
Usable flakes	123	10.9
Blades	109	9.6
Broken flakes and blades	261	23.2
Micro-burins	4	0.4
Possible axe sharpening flakes	2	0.2
Retouched	21	1.9
Total	1126	100.0

fragments of nodules that had been tested and discarded, primary decortication flakes, core mass reduction and shaping flakes, small trimming flakes, potentially usable flakes and blades, finished products in the form of retouched and used flakes and blades and the by-products of tool manufacture, as represented by microburins and possibly tranchet axe sharpening flakes. However, the assemblage (table 4) was dominated by pieces representing the earlier stages of the reduction strategy and unusable waste from core reduction. Even with many of the potentially usable flakes and blades there were often reasons why their manufacturers may have rejected these pieces, including irregular shape, excess thickness or the presence of hinge/step scars on the dorsal surface.

The bulk of the assemblage appeared to be the product of a single technological tradition. Notwithstanding the limitations imposed by defects in the raw material, this consisted of a competent and systematic approach to producing standardised narrow flakes and blades, including the occasional use of cresting (fig 8, no 1). Blades, blade-like flakes and narrow flakes dominated the assemblages and many of the preparation and maintenance flakes were also long and narrow, many having parallel sides and dorsal scars.

'Raw' nodules were tested and, if suitable, reduced until a suitable platform and core face was produced on one part, often leaving the remainder of the nodule unreduced; this platform was then used to produce blades and flakes. After the initial platform had become exhausted or unusable, a second or even third was sometimes prepared, often involving the decortication and shaping of an unmodified part of the nodule, as demonstrated by the presence of flakes that removed areas of cortex or other irregularities as well as parts of exhausted platforms. Platforms were regularly trimmed and properly maintained, resulting in many core rejuvenation flakes being produced, including true 'core tablets' (fig 8, nos 2–3) and flakes struck transversely (fig 8, nos 4–5) or longitudinally (fig 8, no 6) across the core face, either to remove hinge and step fractures or remnants of cortex. Some of the longitudinal rejuvenation flakes struck from the base may have resulted from attempts to keep the core face perpendicular to the platform.

### Tested nodules

Many tested nodules were found; the number recorded here probably underestimates the total present as many pieces of flint exhibited some concoidal fracture scars, although not necessarily of deliberate origin, and these have been excluded from the count. The convincing tested nodules included here consisted of rounded nodules, often thermally shattered into angular fragments, and frequently it was the thermal scars that were initially used as striking platforms. This is also demonstrated by a number of flakes representing early stages in the reduction sequence that likewise had thermal scars as striking platforms.

### Cores

Altogether 64 cores and 50 chunks, most probably representing fragments of cores, were found. Most of the cores of all types had some degree of thermal scarring present, and it is likely that many were discarded because of shattering during reduction, making them too small to produce viable flakes or blades.

The cores were generally small and most were probably regarded as exhausted, weighing on average around 50g. Others were irregular in shape, usually owing to the expedient way the knappers dealt with flaws within the flint.

Thirty showed evidence of blade or narrow flake production, although few were of regular (prismatic) shape. Of these the majority were either single platform (mostly type A2 (Clark *et al* 1960)) (fig 8, no 7) or with two opposed platforms (type B1) (fig 8, nos 8–9). However, some multi-platformed (type C) and keeled platformed (types D and E) ones were also present (fig 9, nos 10–11).

Thirteen of the complete cores had irregularly shaped flake scars; they were mostly

randomly aligned multi-platform types (type C), some of which may represent exhausted blade cores.

A further 21 were minimally reduced, consisting of essentially unaltered cobbles with only short sequences of flakes removed. Such cores are often regarded as characteristic of Middle Bronze Age and later industries, and although most were utilised for broad flake removal, a significant proportion had narrow flakes or blades removed. These may represent an expedient use of flawed raw materials or cores rejected at early stages in the reduction process due to flaws that were not apparent during the 'testing' stage.

Although few true prismatic blade cores were present, most did show some evidence of attempts at systematic blade production, either in the form of actual blade or narrow flake scars or less directly, via the careful production and maintenance of striking platforms. These would be compatible with systematic Mesolithic industries, even if they did show a degree of expedient reduction dictated by the qualities of the raw materials. Nevertheless, some of the more opportunistic and minimally reduced cores could potentially have been the product of later industries, sharing some characteristics with Middle Bronze Age and later industries.

### Flakes and blades

The majority of blades and flakes with parallel dorsal scars showed only single directions, and with about only one in six was there good evidence for opposed platform working. The thermally flawed nature of much of the raw material was evidenced by numerous examples of miss-hits, where the fracture line changes course from that intended following thermal fault lines.

### *Metrical considerations*

In order to provide a quantification and study of the metrical and technological traits of the assemblage, all complete unmodified flakes and blades from context 23 were measured and their basic technological attributes recorded (see tables 5–7). Only flakes from context 23 were chosen for detailed analysis in order to maintain some form of contextual integrity, and it was also the only context to provide sufficient quantities of flakes to permit such analyses. Incomplete flakes were excluded, including those that shattered along thermal flaws during reduction (laterally split flakes and step fractures) as, although these may be considered technically complete, it was often difficult to separate these from those with snap fractures that occurred after flaking. In addition, the size and shapes of flakes broken along thermal flaws were more likely to reflect deficiencies within the raw materials than the intended products of the knappers.

In order to obtain an impression of the shape and size of the original assemblage it is necessary to exclude all flakes broken subsequent to manufacture. It is likely that thin and slender flakes would be most prone to post-manufacture breakage, especially with those of blade proportion but also with other potentially usable flakes. Thicker flakes, notably decortication and core-shaping flakes, were likely to be over-represented, as were miss-hits that came out thicker than intended, either through thermal flaws or simply by mistake.

In an attempt to provide dating evidence, and following the standard work by Pitts (1978a & b) and Pitts & Jacobi (1979), the shape distribution of all measured unmodified complete flakes was established by dividing their breadths by lengths, and these were compared to

Table 5 Average metrical sizes

Total = 325	L/B ratio	L (mm)	B (mm)	W (mm)	Wt (g)	SP width (mm)
Average dimension	1.73	39.1	25.9	7.6	9.2	3.3
SD		13.5	11.9	4.8	12.1	2.9

Table 6 Flake shape as determined by breadth divided by length ratios

Reference	Suggested date	Breadth/length ratio					
		<0.2	0.2–0.4	0.4–0.6	0.6–0.8	0.8–1.0	1.0+
<b>Carshalton BTG 01</b>		<b>0</b>	<b>18.5</b>	<b>25.8</b>	<b>22.5</b>	<b>19.1</b>	<b>14.1</b>
Pitts	Early Mesolithic	2	43	27	13	6.5	9
Pitts & Jacobi	Early Mesolithic	1	34.5	26	15	9.5	14
Pitts	Later Mesolithic	0.5	15.5	30.5	22	14.5	17
Pitts & Jacobi	Later Mesolithic	0.5	13	27	22.5	14	23.5
Pitts	Early Neolithic	0	11	33	27.5	14.5	13
Pitts	Later Neolithic/Bronze Age	0	3	16	25	23	33

samples from other dated assemblages as given in Pitts (1978b, 194) and as modified from Pitts & Jacobi (1979, 166) (table 6). These results indicated that there were fewer narrower flakes than would be expected for Early Mesolithic assemblages but more than anticipated for a date after the Mesolithic, this assemblage being most comparable to later Mesolithic assemblages.

Such comparative exercises are obviously crude in that the assemblage here may be mixed to some degree with later prehistoric material, albeit in probably small quantities, and possibly contains a higher proportion of large decortication and nodule trimming flakes than some of the compared assemblages, both being factors likely to result in a later date being indicated. Other factors that have to be taken into account include the possible varying methods of measuring the flakes, and the influence of differing qualities of raw materials used. Nevertheless, and as important as these qualifications may be, the results do suggest that this assemblage may be most comparable to others dated to the later Mesolithic.

### *Key attributes*

The striking platform-, bulb- and distal termination-type and dorsal scar orientation of the 325 complete flakes from context 23 were recorded and the results of these are presented in table 7.

This demonstrates that despite the numerous preparation and maintenance flakes present, there was a definite tendency for flakes and blades to exhibit diffuse or, especially noted on the blades, small discrete hemispherical bulbs of percussion, and feather distal terminations. Platforms, even on some of the decortication and core preparation flakes, were frequently modified, sometimes by the simple flaking of overhangs but more usually by fine grinding and abrasion modifying the platform/core face angle. Other than simple flaking to form the striking platform, true platform modification was very rare, those with dihedral platforms

Table 7 Key attributes of complete flakes from context 23

Platform	Flakes	%	Distal termination	Flakes	%
Edge trimmed	134	41.2	Feather	216	66.5
Cortical	42	12.9	Hinged	90	27.7
Dihedral	13	4.0	Plunged	19	5.8
Faceted	7	2.2	Dorsal scars	Flakes	%
Plain	111	34.2	Multidirectional	50	15.4
Shattered	18	5.5	None	18	5.5
Bulb type	Flakes	%	Orthogonal	12	3.7
Diffuse	119	36.6	Parallel	98	30.2
Intermediate	34	10.5	Single	50	15.4
Pronounced	81	24.9	Unidirectional	97	29.8
Discretely rounded	91	28.0			

mostly appeared to use ridges opportunistically rather than deliberately creating them, and at least some of those with faceted platforms were probably platform chips or core tablets, although a few may conceivably come from thinning bifacial implements.

### *Retouched items*

Twenty-one flakes or blades with secondary modification were identified, representing a relatively low (1.9%) proportion of the total struck assemblage. Although not numerous, a variety of types was present, suggesting a range of activities were performed at the site or that tools for a variety of uses were prepared, although it should be noted here that the nomenclature assigned to the tools are those traditionally used and do not imply any specific function.

### Microliths

Three possible microliths were recovered, comprising two obliquely blunted points, one of which was burnt and broken (fig 9, nos 12–13). The complete microlith measured 47 x 9 x 3mm and weighed 0.9g. The third piece is more problematic. It comprises a flake or blade that has microlith-style retouch along one edge. It had then ‘split’ down its longitudinal axis, completely along one edge and partially along the other (fig 9, no 14). It is impossible to reconstruct its original form or even assess whether this splitting was done intentionally to form the piece or had occurred accidentally, such as from an impact fracture. It has been interpreted as a microlith.

Microliths are diagnostic Mesolithic implements. It is sometimes possible to differentiate between Early and Later Mesolithic types; Early Mesolithic microlith assemblages tend to be dominated by simple obliquely truncated types, and these tend to be bigger and broader than later Mesolithic examples. The only complete example here may be most similar to early types, but as these chronological differences are a matter of degree, no reliability should be placed on a single specimen, and only a general Mesolithic date can be indicated.

Associated with microlith manufacture are microburins. One definite (fig 9, no 15) plus two possible examples (fig 9, nos 16–17) were recovered. These were all made on the proximal end of probable blades, the definite example having remains of an abandoned attempt to make a microburin break preserved on its edge. In addition, a medial blade fragment also had a typical asymmetrical notch (eg Rankine 1946, fig 2) cut into it, which may also represent a failed attempt at microburination (fig 9, no 18).

### Scrapers

These formed the most common retouched type, with seven being recovered. They vary considerably in form although all were made on short thick flakes, variously retouched on their dorsal surfaces along their distal and/or sides, with one ‘side’ scraper being made on a thermal blank (fig 9, no 19) and three others on largely cortical flakes (figs 9–10, nos 20–22). Most had convex working edges although some were straight or slightly concave (fig 10, no 22) or showed a degree of denticulation (fig 10, nos 23–25). Scrapers are traditionally associated with hide preparation although they were probably used for a variety of tasks, but unfortunately are one of the least chronologically diagnostic tool types.

### Burins

Two burins were present. One consisted of a largely cortical flake that had a burin spall removed transversely across its distal end, and also exhibited heavy use-wear around the working edge (fig 10, no 26). The other was more complex, consisting of a narrow flake or blade that had been truncated distally, the truncation serving as the platform to remove a

longitudinal burin spall. In addition, portions of the right dorsal margin had been blunted, enabling the burin to be held tightly and comfortably (fig 10, no 27). This also exhibited some damage to its working edge. Interestingly the working edges on both burins were the same size, being marginally under 5mm across. Burins are occasionally recorded from Early Neolithic contexts, although they are most characteristic of Upper Palaeolithic and Mesolithic industries.

### Piercers

The second most common tool form consisted of piercers, of which four were recovered. Only one had been elaborately retouched, consisting of a large blade or blade-like flake that had been heavily notched and strengthened on and along its left ventral, forming a long, sturdy awl-type point (fig 10, no 28). The other three had only been minimally retouched at the distal end, creating or accentuating the point. One, made on a fragile blade, had a partly truncated distal end accentuated with two shallow notches either side (fig 10, no 29). Another also had its distal end partially truncated and a shallow notch cut on one side, although this example was thicker and with a cortical surface than may have aided handling (fig 11, no 30). The remaining example was made on a thick primary flake with retouch modifying its distal end (fig 11, no 31).

### Knives

Two knives were recovered. Both were made on fairly narrow flakes, one with bifacial invasive retouch around the proximal end of one margin, possibly forming a cutting edge, although the opposite margin bore traces of heavy use-wear (fig 11, no 32). The other had steep backing along its left dorsal edge and shallower retouch and use-wear along its right dorsal edge (fig 11, no 33). Knives of various descriptions can be found among all Holocene industries, although the use of invasive retouching is not commonly encountered before the Neolithic, possibly suggesting the first example may have been manufactured after the Mesolithic.

### Fabricator

One narrow flake with a thick triangular cross-section exhibited heavy battering and abrasion around all of its margins (fig 8, no 4). No actual polishing was observed but the piece would be most characteristic of those tools known as fabricators. These are variously described as 'strike-a-lights' or flaking tools, and are found in most Holocene assemblages.

### Spurred flakes

Two narrow flakes, one of blade proportions, had minimal retouch accentuating sturdy right-angle points on one of the ends and a contiguous part of one edge (fig 11, nos 35–36). The blade had its distal end modified and the flake its bulbar end. Spurred flakes are probably more commonly found among later prehistoric assemblages although they are present within Mesolithic assemblages (eg Barton 1992, fig 5.22, 6–7). They may have been used for heavy-duty piercing, scoring or engraving, possibly comparable in function to a burin or piercer.

### Bifacial implements

Two possible tranchet axe sharpening flakes (fig 11, nos 37–38) and a small number of flakes that may have resulted from biface thinning (fig 12, 39–40) were identified (cf Ashton 1988). No tranchet axes were recovered during the excavations although numerous examples have been recovered from the locality (eg Cotton & Hayes 1980; Cotton 1987; Barber & Birley 1996).



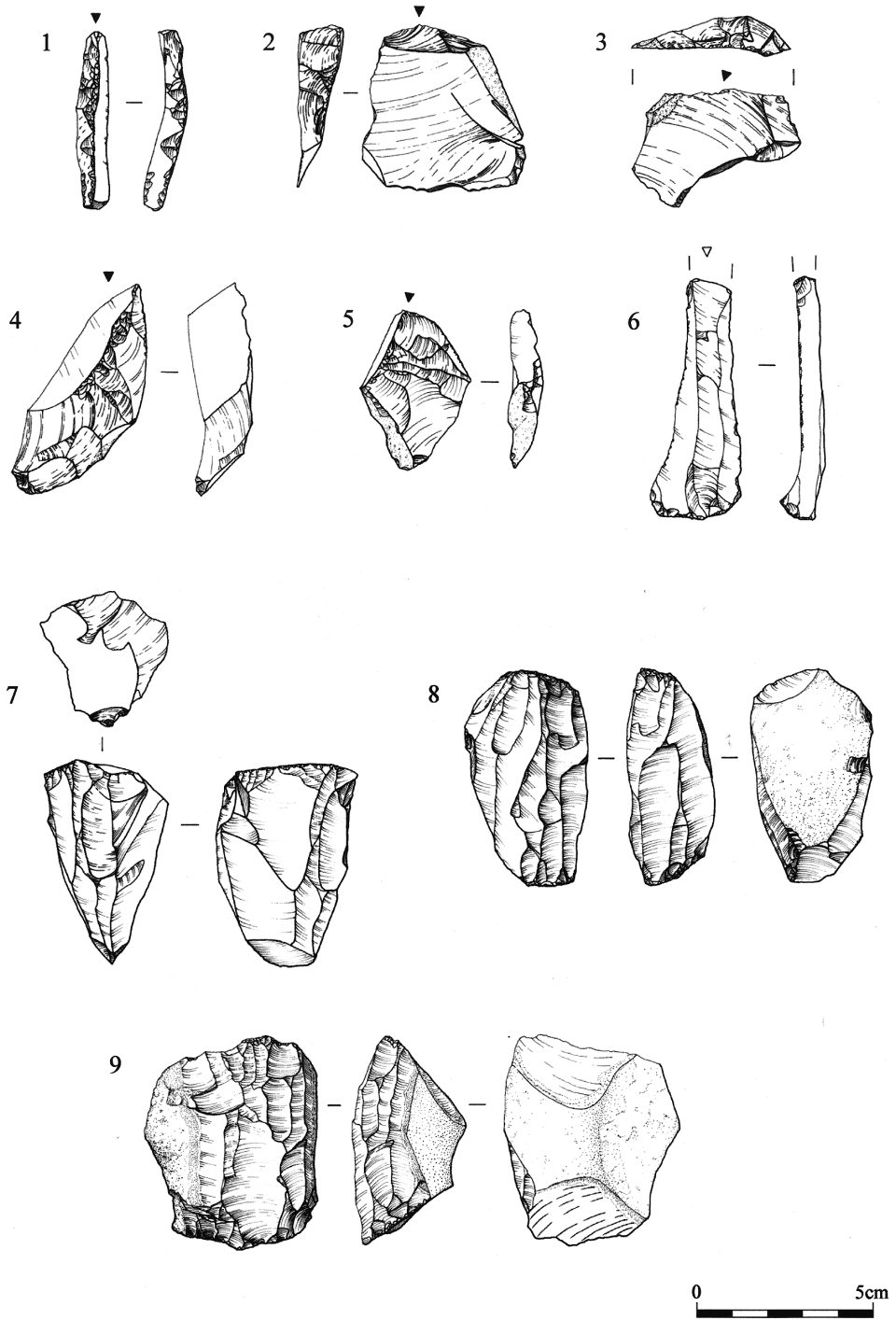


Fig 8 The former Vinamul site, Butter Hill, Wallington: struck flint, nos 1-9.

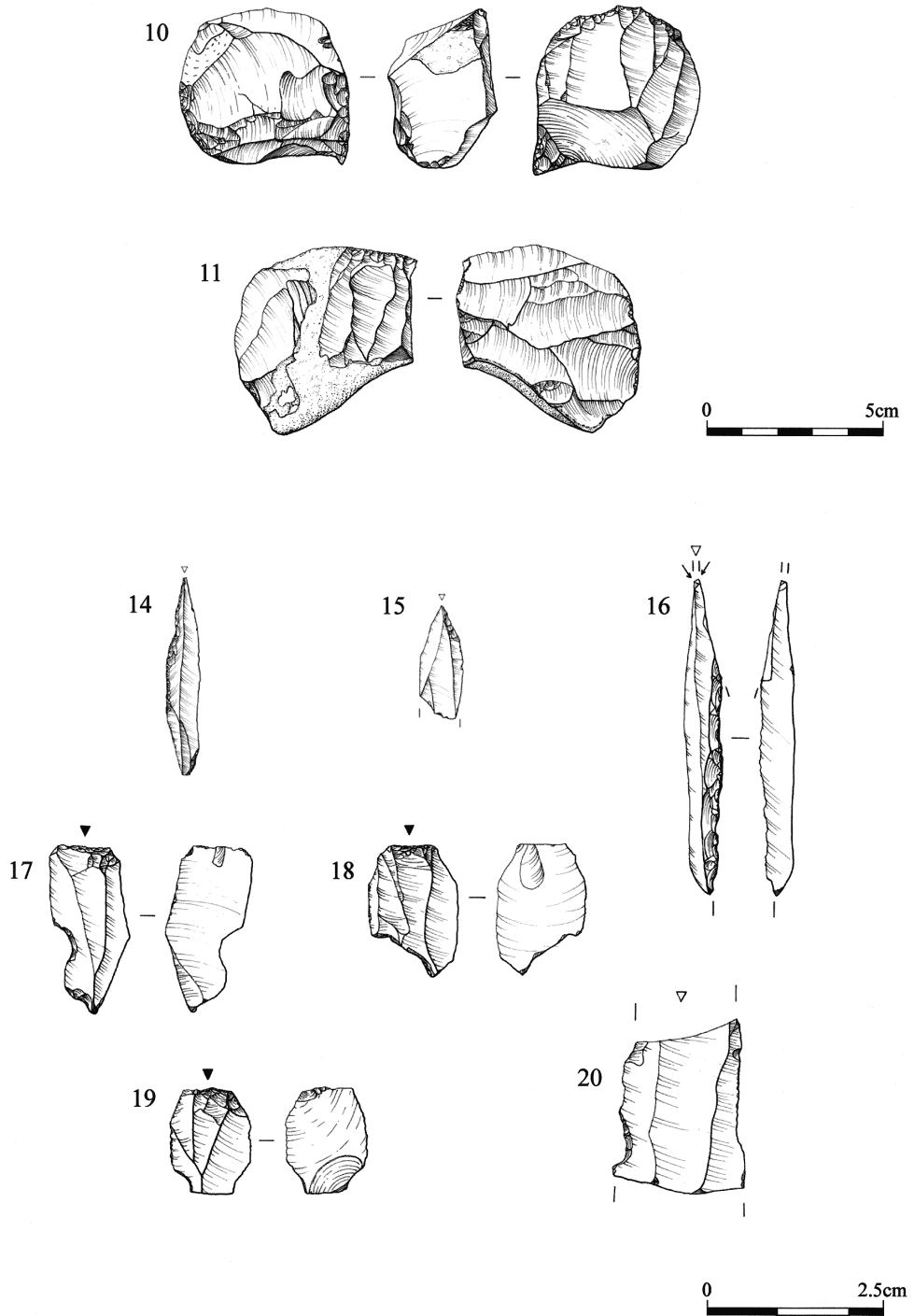


Fig 9 The former Vinamul site, Butter Hill, Wallington: struck flint, nos 10-20.

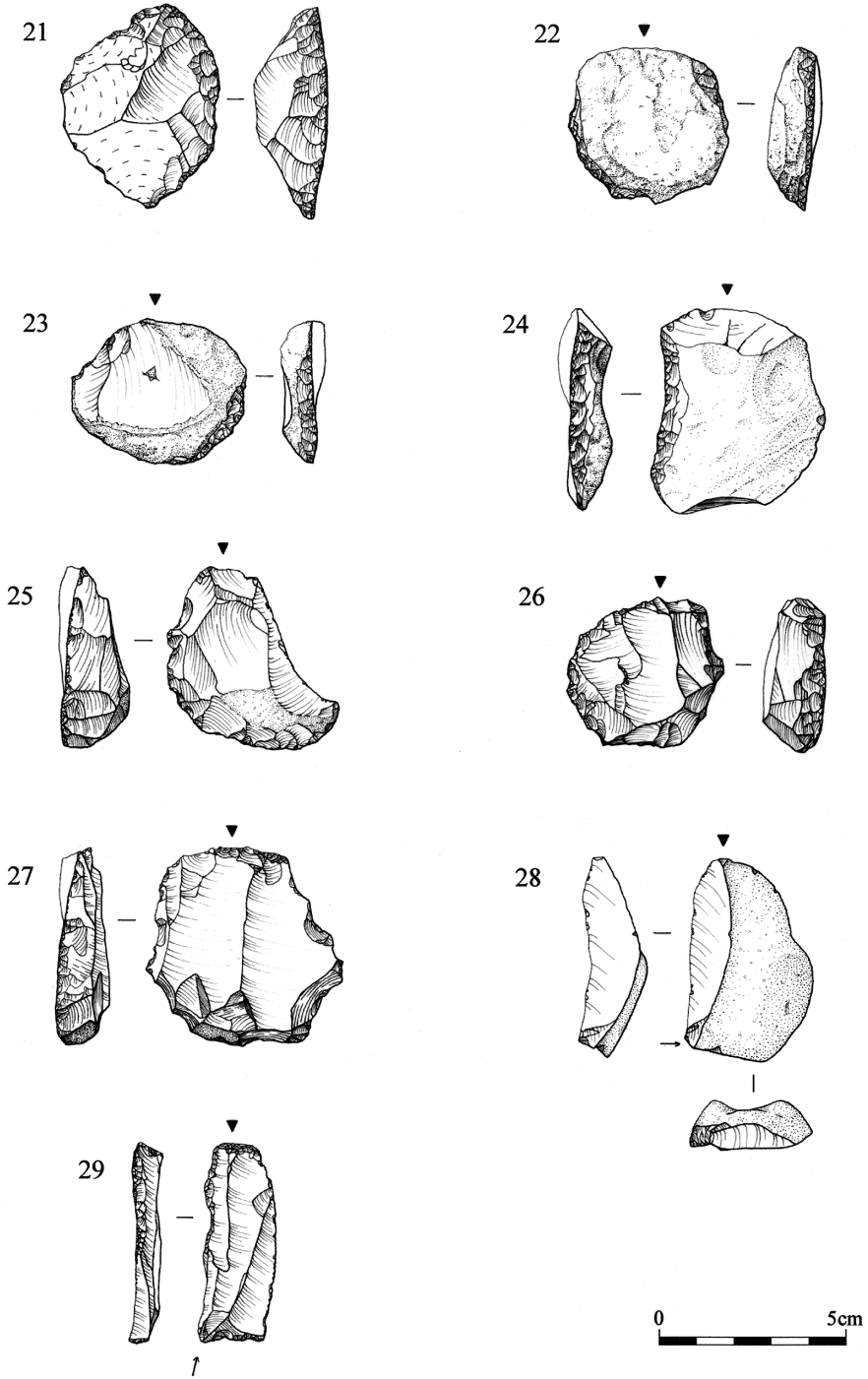


Fig 10 The former Vinamul site, Butter Hill, Wallington: struck flint, nos 21–29.

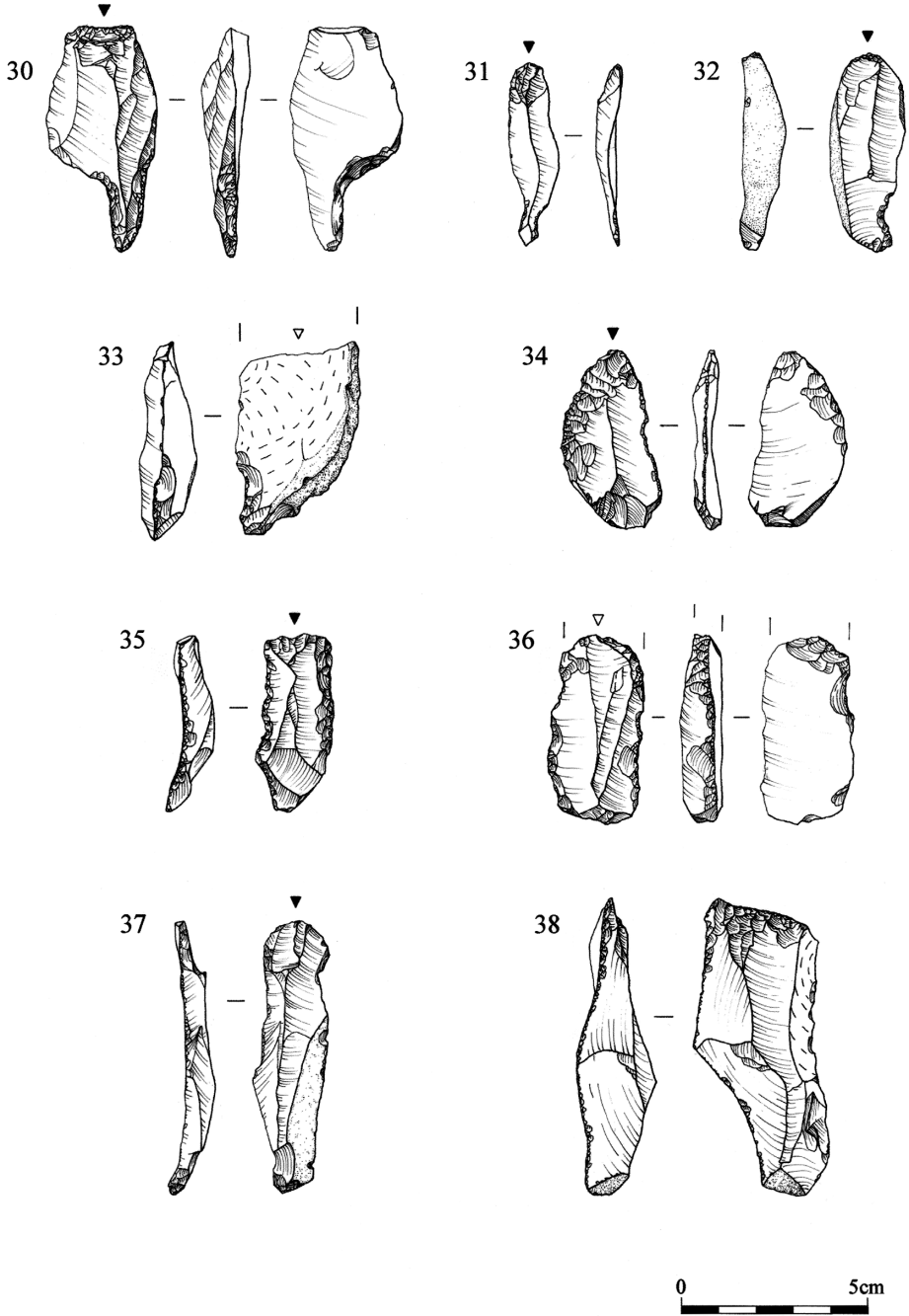


Fig 11 The former Vinamul site, Butter Hill, Wallington: struck flint, nos 30–38.

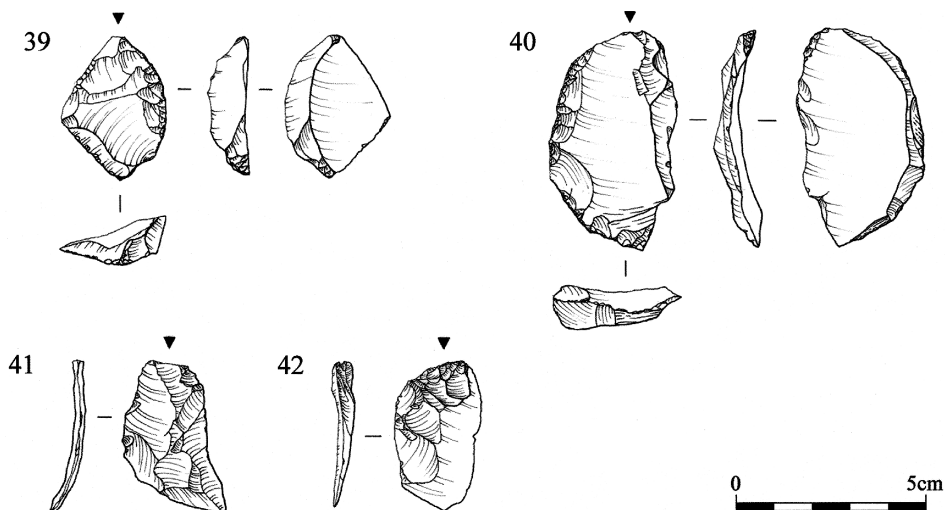


Fig 12 The former Vinamul site, Butter Hill, Wallington: struck flint, nos 39–42.

### *Pit fills 15 and 17*

As well as a few pieces of presumably residual struck flint both of these pits had large cobbles placed within them. Pit 16 had four, weighing between 2.3 and 3.5kg, while pit 18 had three, weighing between 0.3 and 0.7kg, all of which exhibited a few conchoidal fracture scars and appeared to have been deliberately struck at some point. Since these were recovered from pits dated to the Saxon period it is presumed that they are either residual or were used as building material.

### THE ANIMAL BONE, by Philip L Armitage

A total of 79 bone fragments (Number of Identified Specimens Present) were recovered from the site. Applying standard archaeozoological methodological procedures, 78 (98.7% of the total) are identified as mammalian and a single bone (1.3%) is recognised as avian.

The species represented are listed as follows:

Wild species: red deer (*Cervus elaphus*); wild boar (*Sus scrofa*)

Domesticates: cattle (*Bos* (domestic)); pig (*Sus* (domestic)); dog (*Canis* (domestic))

Domestic or wild: horse (*Equus caballus* (?domestic))

### *Results*

#### Horse

Based on the lateral length (Ll 309mm) in the radius from context 23 (Mesolithic–Bronze Age) the withers height in this particular horse would have been 134cm (calculated after the method of Kiesewalter 1888). The Butter Hill animal may be compared against other prehistoric horses, as follows:

Neolithic site at Durrington Walls (Harcourt 1971): 129–148cm (? wild horses)

Late Bronze Age site at Runnymede Bridge (Done 1980): 138cm

## Cattle

All the bones identified as bovine are from domestic rather than wild cattle. Using the lengths in two complete long bones, both from the prehistoric phases, the withers heights are estimated as follows (factors of Fock 1966):

Metacarpus GL 195mm x 6.13 = withers ht 119.5cm

Metatarsus GL 211mm x 5.45 = withers ht 115cm

The Butter Hill cattle fall within the size-range documented by other workers for British prehistoric domestic cattle:

Durrington Walls (Harcourt 1971)

Neolithic 122–143cm

Iron Age 105–26cm

(cf wild aurochs had a withers ht up to 180cm)

Ashville Trading Estate, Abingdon (Wilson 1978)

Iron Age 100–118cm

## Pigs

Both wild and domestic pigs appear to be represented. The former by the lower mandible from context 23 (Mesolithic–Bronze Age) in which the length (40.6mm) of the fully erupted/worn lower third molar falls with the size-range documented for *Sus scrofa* (40–49mm according to Clason 1967; 39.7–42.8mm, mean 41.1mm, data of Payne & Bull 1988). The size in the Butter Hill wild pig may also be compared against the pigs from the Late Bronze Age settlement at Runnymede Bridge examined by Done (1980: M3 length 29–40mm, with the larger individuals identified as wild).

## Dog

The shoulder height in one of the dogs represented at Butter Hill may be calculated from the length of its radius (GL126), context 20 (Saxon peat layer) at 42cm (using the regression formulae of Harcourt 1974).

## Red deer

The size (proximal width Bp 43.8mm) of the red deer metatarsus from Butter Hill context 25 (Mesolithic–Bronze Age) is noticeably larger than either of the two modern deer in the collections of the Natural History Museum, London:

Male (reg no 1962.11.22.1) Bp 35.5mm

Female (Newton collection) Bp 32.5mm

*Date of the faunal remains*

Despite the finding of Mesolithic worked flint material in the contexts, the presence of bones of domesticated animals (cattle and pigs) clearly indicates the faunal assemblage is of later date (no earlier than Neolithic and possibly Bronze or Iron Age).

## THE ANTLER PICK, by Ian Riddler

The pick was made from a naturally shed red deer antler (fig 13), stemming from the left side of the animal, from which the entire brow tine has been removed, as well as the trez tine and the crown. The antler survives in good condition, although it is slightly friable. It is buff to brown in colour, with some staining from adjacent material in its context. The brow tine of the antler has been cut away from the top and the base, and the cortile tissue at the centre has been fractured to separate the tine from the beam. A similar process was used to

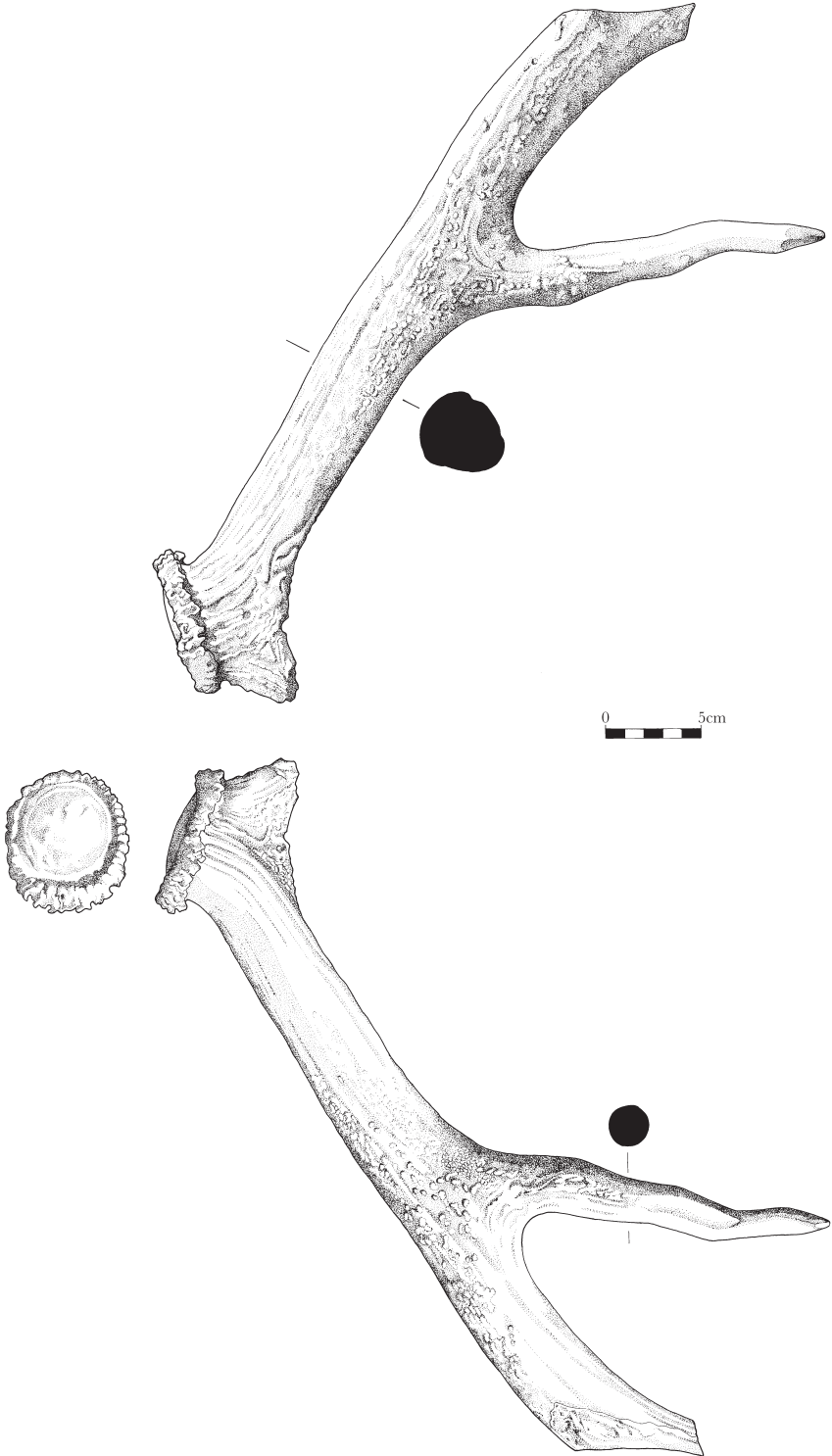


Fig 13 The former Vinamul site, Butter Hill, Wallington: the antler pick.

remove the trez tine, although it was cut from above and from one side, and the central portion was then snapped away. The bez tine is intact and is largely unmodified except for its end, which has been faceted about its circumference to provide a blunt point. This part of the tine is a darker brown colour than the remainder of the antler. The tine is uneven in shape and is swollen at a point close to the beam, indicating some trauma in growth. Further along the tine an area of *c* 70mm in length has been smoothed with the aid of a blade. Adjacent to the tine and slightly above it are two blade marks on the beam, aligned horizontally and set more or less in the centre.

The crown has been removed in antiquity, using the technique described above. As a result, it is not possible to determine how many tines were originally present on the antler. The antler is now in two sections, and was split in a line across from the centre of the trez tine in antiquity. Both sections of the antler were deposited in the same context, however.

### *Discussion*

The red deer antler, now in two fragments, has been modified to form a pick. The brow and trez tines have been cut away, as well as the crown. The bez tine remains, however, and its end has been faceted to a blunt point. Subsequently, the pick was severed along a line running across the stub of the trez tine, thereby shortening the beam still further. The bez tine has been trimmed and faceted to provide a more even point.

Antler picks are a characteristic of earlier prehistoric assemblages, and important groups are known from Grimes Graves, Durrington Walls and Stonehenge, among other sites (Clutton-Brock 1984; Serjeantson 1995). Interestingly, the great majority of these use the brow tine rather than the bez tine as is the case in the Vinamul example. The means by which they were used have been demonstrated by experiment (Kaiser 2002). Post-Roman antler picks are less common, particularly from Anglo-Saxon England, but examples are known both from Scotland and Ireland, as well as from the Continent. Antler picks have been published from several Scottish sites, including Foshigarry, Gurness, Howe and Skail (Hallén 1994, 203 and fig 5; Porter 1997, 100). Some of these implements may be of Iron Age date, but others are early medieval. Picks of 10th or 11th century date are known also from Dublin and Killickaweeneey in Ireland (Riddler & Trzaska-Nartowski forthcoming). Contemporary examples occur also in Frisia, and were recovered from the Slavic settlement at Berlin-Spandau (Roes 1963, 48 and pl LX.10; Becker 1989, 122–3 and taf 34.1). As with this example, the basic shape of the object remains the same, although those of post-Roman date tend to be shorter and opt in some cases (as here) to use the bez tine as the point, rather than the brow tine. Several distinct forms of antler pick are known from Dublin.

### THE POTTERY, by Chris Jarrett

#### *The Saxon pottery*

The peaty deposit yielded a handful of sherds in two different shell-tempered fabrics. One fabric is sparsely shell-tempered, up to 5mm in size but most are finer, occurring with occasional, poorly sorted grey quartz, less than 1mm, and sparse angular grog, with a grey core and buff surfaces. The second fabric has a grey core and grey/brown surfaces with inclusions of abundant shell up to 6mm, but is mostly finer with very sparse iron ore up to 2mm. These shell-tempered sherds are difficult to assign to existing coding systems for London and Surrey (Vince & Jenner, 1991; Jones 1998), but probably indicate a Mid- and Late Saxon date, although the abundant shell-tempered ware also closely fits Early Medieval Shelly ware (EMSH), dated 1050–1150.

#### *The post-medieval pottery*

A small number of sherds of post-medieval pottery were recovered from both the water



channel and the resultant layers of alluvium. These included sherds of Red Border ware (RBOR) as fragments of bowls, dated 1580–1900, and a sherd of a post-medieval redware (PMR) dish. A complete Refined whiteware (REFW) miniature cylindrical jar was present and is dated from 1800 to 1900 but could also date to the 20th century. Also included in the assemblage was a sherd of Developed Creamware (CREA DEV), dated 1775–1880, a Transfer-printed ware (TPW) teacup dated 1780–1900 and a fragment of a Refined white earthenware bowl decorated with a broad green slip band and a line of gilding. These features are therefore dated to the 19th and 20th centuries.

## Conclusion

The Carshalton area has long been recognised as prolific in prehistoric remains, and numerous Mesolithic artefacts have been recorded along the Wandle valley (Turner 1966; Pryer 1974; Orton 1989; Barber & Birley 1996; Bagwell *et al* 2001), although little is known of landscape use or settlement organisation at this time. The site reported here represents a location where flint raw material, present in a stream bed, was procured and worked during the Mesolithic period. Potentially usable nodules were tested, and suitable pieces were completely reduced. It would appear that the majority of useful flakes and blades and any still-productive cores and tools were removed for use elsewhere. Some retouched pieces were present and these would suggest that other activities were taking place in the vicinity, possibly part of a more ‘domestic’ (as opposed to purely industrial) style settlement situated close by, but away from, the stream, and not within the areas archaeologically investigated. Although the raw material available was clearly plentiful and capable of blade-based reduction, a notable recurring feature of it was its inherent limitations caused by its thermal flaws. It may be surprising that better deposits could not be found, perhaps closer to the parent chalk, and if so, why were these deposits not utilised instead? The answer might be that the place, in addition to possessing raw material supplies, was also accorded some other sort of significance, possibly associated with the springheads of the tributaries of the Wandle, and therefore procuring the raw material here rather than elsewhere was seen as preferable.

A notable feature of the prehistoric remains in Carshalton is the Late Bronze Age ‘aggrandised’ settlement at Queen Mary’s Hospital to the south (fig 2; Lowther 1946; Adkins & Needham 1985; Bruce & Giorgi 1994), as well as the extensive agricultural and ritual landscape established in the Wandle valley during the same period (Yates 2001; Proctor 2002). The presence on the site of Middle or Late Bronze Age flintwork indicates that the area was being exploited for the raw material, while the remains of domestic animals go some way to indicate that field systems recorded in the Wandle valley (Yates 2001) were associated with the control of livestock. Limited cereal cultivation is also indicated by the pollen taxa preserved in this part of the sequence.

Although significant changes in the local environment led to the stabilisation of the land by the later Saxon period, the area remained waterlogged and little activity was recorded on the site at this time. The presence of cereal grain within this context indicates that cultivated land lay nearby, and fragments of a quern stone further points to the agricultural nature of the area. Two enigmatic pits excavated during the Late Saxon period are difficult to interpret; however, the contents do not indicate domestic activity, confirming the peripheral nature of the site. The fast-flowing waters of the river Wandle were ideal for mills, and the Domesday Book records thirteen of them on the Wandle (Bazley 1999).

By the 19th century the river had become overcrowded with industry, with 90 mills recorded along the river Wandle, six of which were in Carshalton (Bazley 1999). A mill race was recorded crossing the site, and can be seen from the map evidence as having served a corn mill, Lower Mill, to the south and rejoining the river further north.

**Endnote**

The tables listed below are available on the Archaeology Data Service website (<http://ads.ahds.ac.uk/catalogue/library/syac/v92.cfm>). Copies of this material will also be deposited with: the Society's library, Guildford; Surrey History Centre, Woking, and the Surrey Sites and Monuments Record, Kingston. Photocopies can also be supplied by post – enquiries should be addressed to the Hon Editors, Surrey Archaeology Society, Castle Arch, Guildford GU1 3SX.

## TABLES

- 1 Results of the lithostratigraphic descriptions and radiocarbon dating
- 2 Results of the radiocarbon dating
- 3 Results of the particle size and organic matter determinations for column sample 13

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