
Chelmsford Excavation Committee

Report 1

CBA Research Report 26

Excavations at
Little Waltham
1970-71

By P J Drury



1978
Published by the Chelmsford
Excavation Committee and the
Council for British Archaeology

To the late
Major J G S BRINSON, F S A
Chairman of Chelmsford Excavation
Committee from its inception in 1968
until his death in 1973

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Excavations at Little Waltham
1970-71

By P J Drury

with contributions by F W Anderson,
R H Allen, J Bayley, L Biek, J Evans,
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J H Thornton, R F Tylecote,
R White, D F Williams, and
D G Wilson

1978 Published by the Chelmsford Excavation Committee
and The Council for British Archaeology

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The Council for British Archaeology, and The Department
of the Environment

ISBN 0 900312 64 5

Designed by Allan Cooper FSIA and Henry Cleere
Published 1978 by The Council for British Archaeology.
112 Kennington Road. London SE11 6RE

The CBA wishes to acknowledge the grant from the De-
partment of the Environment towards the publication of
this report.

Printed by Page Bros (Norwich) Ltd.
Mile Cross Lane, Norwich, Norfolk NR6 6SA

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ISBN 0 900312 64 5

ISSN 0589-9036

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Preface

This report is intended as the first of a series, which will describe excavations undertaken by Chelmsford Excavation Committee between its inception in 1968 and 1976, when responsibility for rescue excavation in the area was assumed by Essex County Council

The excavations at Little Waltham were undertaken at a time when threats to major archaeological sites in and around Chelmsford were at their peak. Much of the work was directed in parallel with excavations on the line of the Inner Relief Road in Chelmsford, particularly the second phase of the temple site (Drury 1972); at the same time, comprehensive redevelopment in Chelmsford town centre meant that a certain amount of time had to be spent

recording medieval timber buildings before and during demolition.

Times have indeed changed; had the excavation been undertaken today, it would have been possible to give it the whole-hearted attention that it deserved, and to have produced this report rather more rapidly. It was in fact begun in 1972. In spite of revision, such a lengthy gestation period has left its impression—particularly evident in the varying format and styles of the figures. One can but hope that this does not seriously detract from the value of the result.

P J Drury
Chelmsford 1977

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I Introduction

Little Waltham lies in central Essex, in the valley of the river Chelmer some 6 km (4 mls) north of Chelmsford. The tidal estuary of the Blackwater, into which the Chelmer flows, is about 16 km (10 mls) to the east as the crow flies, and about 24 km (15 mls) along the valley. Two main roads, the A130 from Cambridge, and the A131 from Sudbury, converge west of the modern village, the A130 continuing south to Chelmsford. A bypass to relieve the village of traffic using the A131 had been proposed for more than a decade before approval was finally given for its construction early in 1970 (Figs 1, 2, and 3).

The area adjoining the junction at Ash Tree Corner (TL 705126) had produced chance finds of Romano-British material, chiefly cremation burials, on several occasions from 1864 onwards (*VCH Essex* 3 (1963), 196-7); construction of a tennis court at 'The Limes' in 1962 indicated the presence of timber structures with gravel floors of the same period. This work was observed by Mrs R M Bazett. Subsequently, in March 1963, Mrs S Chapman undertook small-scale excavation in the field to the west (Bazett & Chapman 1966). In view of the possibility that there might be further timber structures of Romano-British date in the area to be affected by the proposed road, trial excavations were undertaken in March 1970 by the writer for Chelmsford Excavation Committee, at the request of the then Ministry of Public Building and Works.

These excavations indicated that the principal interest of the site lay in its occupation in the pre-Belgic Iron Age; although Romano-British and medieval occupation was also attested, its importance appeared comparatively slight. However, the willingness of the Highways Department of Essex County Council to reimburse the cost of topsoil stripping on a commercial basis permitted an extensive

exploration of the land in the line of the road, regardless of the density of features known from trial trenching. Two areas, in aggregate in excess of 1 ha, were therefore stripped, intervening hedges being removed and recent ditches completely cleared by machine. Area A lay to the north of the A131, and area B to the south (Fig 3).

Excavation was undertaken in two seasons, September-November 1970 and March-June 1971, the opportunity being taken during the latter season to extend the original area A southwards, as part of the garden of 'Foxtons' became available in the early stages of the road contract. Two areas initially trenched were not subsequently stripped; area A1, south of A, was devoid of features, with the exception of a post-medieval watercourse, and area B1, south of B, was mostly disturbed by post-medieval gravel extraction. In the summer of 1970, the owners of Site D expressed their intention of proceeding with its development as a service station; trial trenching was therefore undertaken concurrent with the first major season of excavation, the results being such that no further work was felt to be justified.

The initial stages of the road contract were observed; no features of archaeological interest were found north of the river Chelmer, thus confirming the negative results of trial excavations undertaken on site C during the first major season of excavation. Contractor's works in connexion with the bridge to carry the new road across the Chelmer revealed an earlier course of the river; the implications of this are discussed further below (p 51). An interim report appeared in *Current Archaeology*, 36 (Drury 1973); the finds have been deposited in Chelmsford and Essex Museum (accn no 1978:121).

II The site

Topography

In Fig 2 Little Waltham is shown in relation to the physical features of central Essex, and known Iron Age settlement in the area. Save for the Danbury area, most sites are on or near rivers or major streams. This may reflect the true position, or merely the distribution of the modern development which has led to the discovery of many of the sites. No distinction is made between 'Belgic' and pre-Belgic material, and the basis for inclusion ranges from one or two sherds, through a 'Belgic' cemetery to indications of major settlement; a detailed consideration of the evidence for each site would be out of place here.² At Braintree there is a probable late pre-Roman Iron Age *oppidum* of considerable size, in an area which has produced evidence of extensive, if not as yet intensive, early Iron Age occupation (the evidence is published in Drury *et al* 1976). At Danbury, excavations undertaken by Essex County Council Archaeological Section within the earthwork around the church (1) are currently being prepared for publication,³ whilst at Twitty Fee (2) an earthwork, probably of late pre-Roman Iron Age date, was recorded by J M Bull and Gerald Dunning during gravel extraction in the 1930s.⁴

The site with which we are concerned lies on the south-west slope of the Chelmer valley, which at Waltham rises rapidly from approximately 31 to 38 m above OD Newlyn. The river has its origin in a number of sources in the north-west of the county (Fig 1), forming a sizeable stream in the Dunmow area, some 15 km north-west of Little Waltham (Fig 2); in the area under discussion the stream is generally

some 7 m wide, the depth of water varying between 1 and 2 m. The flow is distinctly sluggish, the fall from Dunmow to Waltham being only some 15 m.

Plates I-III show the site in its local topographic context.

Geology and soils

R H Allen

The subsoils were seen in a boundary ditch alongside the A131 Little Waltham bypass. The soils here are essentially similar to those recently mapped by the Soil Survey in the Little Waltham district (Allen & Sturdy forthcoming).

Geology

Soils are developed on a wide range of geological parent materials, varying in age from Eocene to Recent, exposed in the valley of the River Chelmer.

The Alluvium of the Chelmer is channelled into the London Clay which floors the valley. The modern alluvium was laid over an earlier sandy gravel deposit. Slightly above the level of the flood plain is a thin spread of Brickearth, again overlying gravels. Upslope the London Clay outcrops. The upper slope cut in the London Clay has pockets of mainly clayey gravel derived probably from a thin cover of Glacial Gravels. This is then capped by Chalky Boulder Clay of the Anglian (=Lowestoft) Glaciation.

The London Clay is a brown-weathering stoneless grey clay. The Glacial Gravels, seen in great thickness in quarries at Broomfield to the south-east, are very much reduced at Little Waltham, being found only as pockets in the upper portion of the London Clay. These are probably remnants of outwash gravels from the Anglian ice sheet.

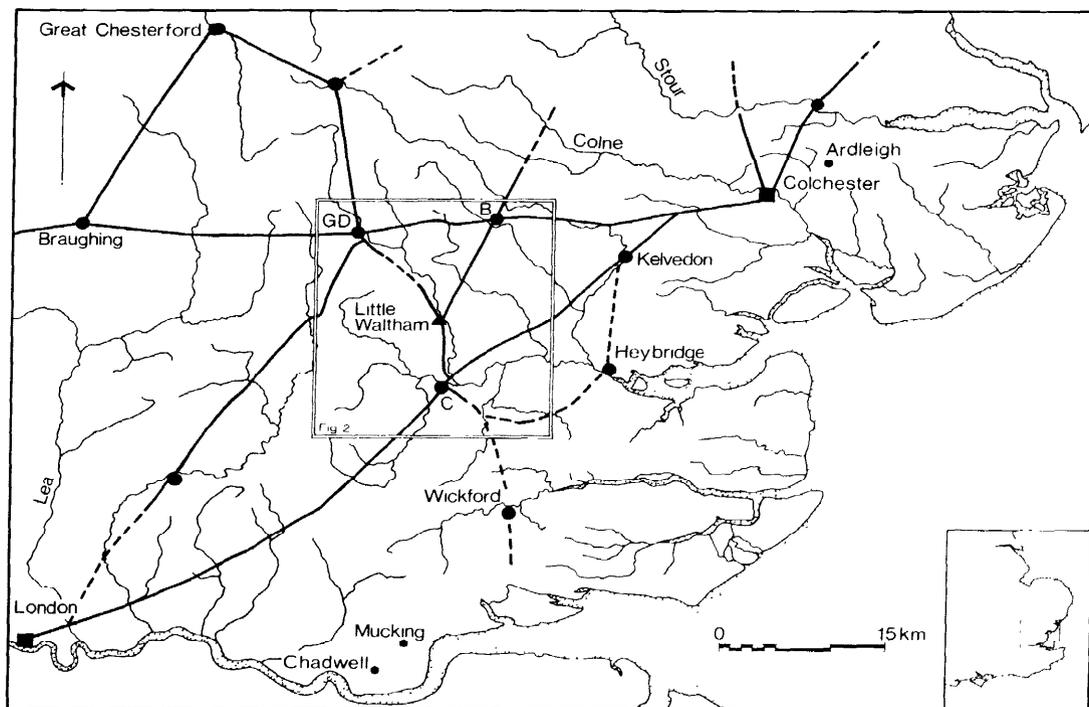


Fig 1 Little Waltham in relation to principal Roman roads and settlements in Essex (B, Braintree; C, Chelmsford; GD, Great Dunmow), and other Iron Age settlements mentioned in the text (Ardleigh, Chadwell, and Mucking)

Geological Succession :

		<i>valley bottom</i>	<i>lower valley side</i>	<i>upper valley side</i>
Quaternary	Recent Pleistocene	Alluvium	River Brickearth	Chalky Boulder Clay
		Valley Gravels		Glacial Gravels
Tertiary	Eocene	London Clay		

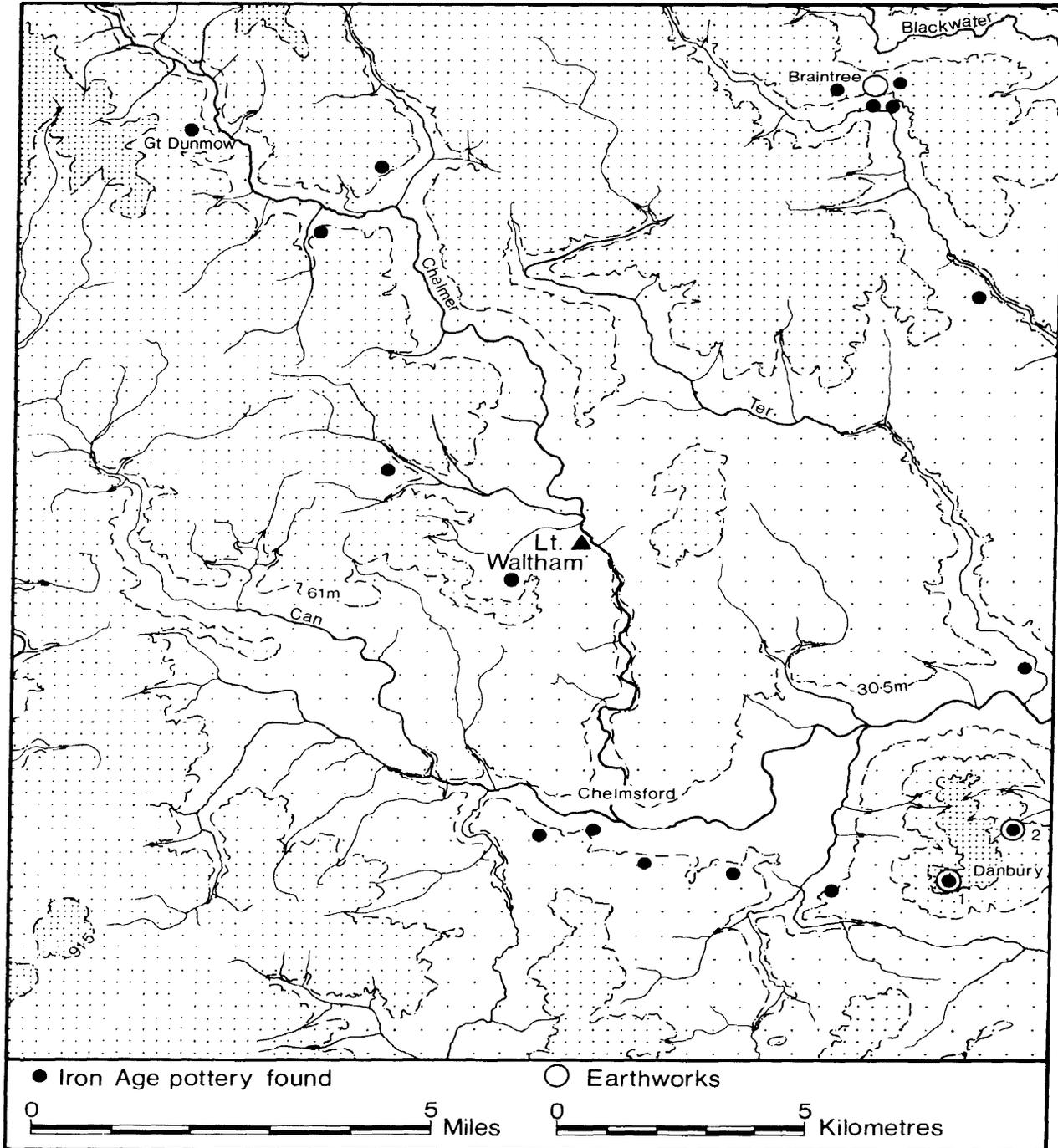


Fig 2 central Essex, showing the physical setting of Little Waltham, and evidence of Iron Age settlement in the area

The Chalky Boulder Clay is a stiff clay containing numerous chalk fragments and flint stones. It is a till deposited on the melting of the Anglian ice sheet and caps the plateau-like interflaves between the valleys in this part of Essex.

The Brickearth appears low in the valley on land slightly higher than the flood plain of the Chelmer. It is a clay in lithology with a small amount of medium sand. It is possibly an alluvial deposit spread on a low terrace of the Chelmer, but may be partly colluvial and derived from the clays upslope.

The modern Alluvium of the Chelmer is a heavier clay with some peat in places associated with a former river channel found during the excavation. Both the Alluvium and the Brickearth are floored by sandy gravels represent-

ing an early phase of deposition of coarse material by the river during the retreat of the Anglian glacier.

Soils⁵

Soils of the River Alluvium

Alluvial soils in this section of the Chelmer valley belong to the *Uffington soil series* and are classified as gleyic brown calcareous alluvial soils. They are calcareous clayey soils sometimes with a clay loam topsoil and subject to moderately high water tables as indicated by grey mottling below 0.40 m. They commonly contain about 5% CaCO₃ in the upper 0.40 m. While subject to a fluctuating groundwater table their clayey texture impedes the natural drainage of surface water and they remain waterlogged in the surface

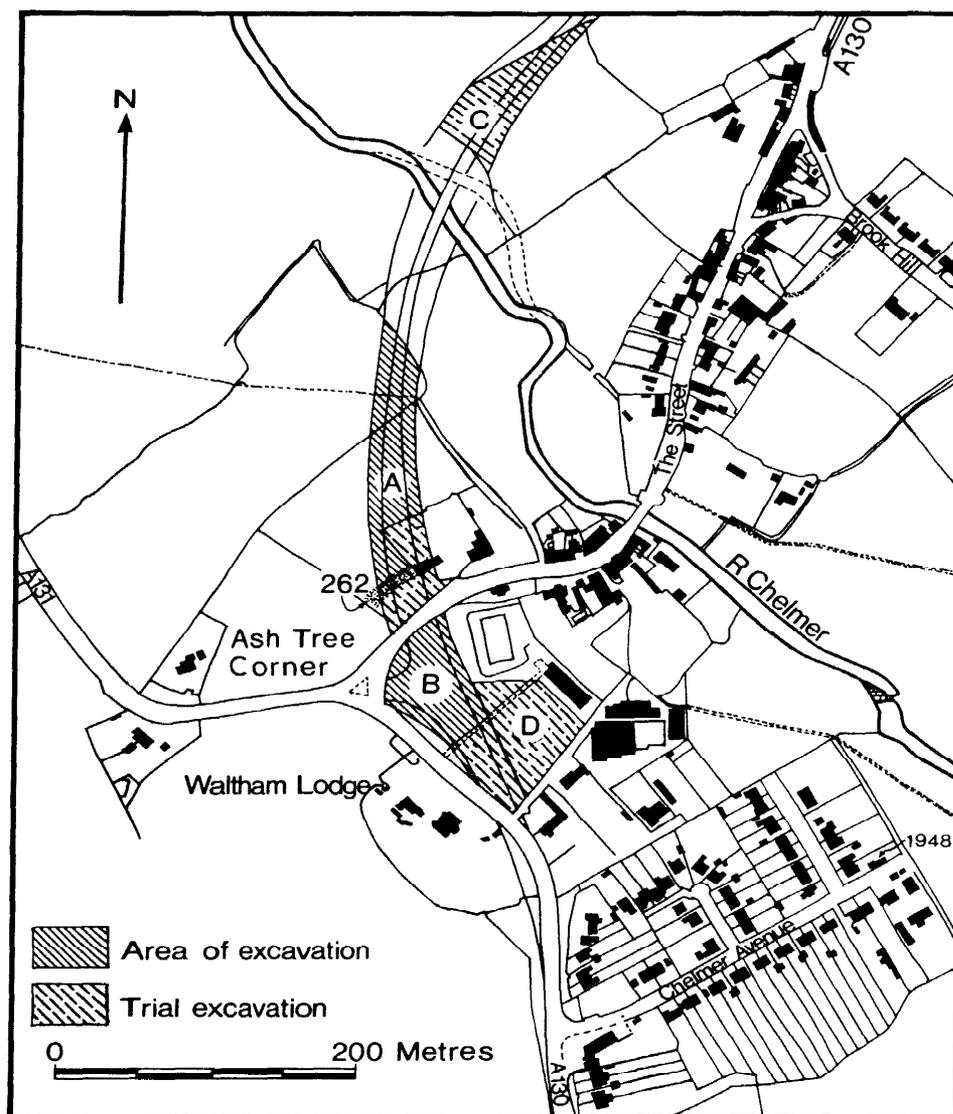


Fig 3 Little Waltham: the sites in relation to the modern village. Based on the Ordnance Survey Map with the consent of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved

for some time after rain or flooding. This impedes cultivation although in this respect the presence of carbonate makes them better agricultural soils than other alluvial soils in the district.

Soils on the London Clay

These soils belong to the *Wickham soil series* and comprise a thin loamy horizon overlying London Clay at about 0.5-0.70 m. They are classified as typical stagnogley soils. Grey and ochreous mottling in the loamy horizons indicates prolonged surface wetness after rain and these soils remain waterlogged for long periods in winter and spring. They also receive run-off from upslope which compounds their wetness. They are naturally acid soils and difficult to cultivate.

Soils on the Brickearth

This brickearth is of only local extent in the district and might better be referred to as thin Head. Its clayey texture gives the soils on it similar properties to the Wickham soils above, although being low in the valley they are subject to seasonal rising water tables.

Soils of the Glacial Gravels

On lower slopes, where pockets and thin spreads of gravels overlie the London Clay, soils of the *Southminster series* occur. They are loamy soils and usually stony and classified as typical cambic gley soils. They occur on the east bank of the valley above the outcrop of the London Clay and are wet soils associated with spring lines.

Upslope of these soils on the eastern side of the valley, soils of the *Terling series* are found. These are classified as typical paleoargillic brown earths and are stony loamy in the upper 0.50-0.70m overlying stony sands, often reddish in colour. They are easily cultivable and drain rapidly after rain but their high sand and stone content gives them a very low available water capacity and they tend to be droughty when cultivated. On the west side of the valley, soils on the glacial gravels are very similar but the presence of grey mottling below 0.50-0.60 m suggests that the soils are subject to some wetness at depth. These are referred to the *Chelmer series* and are classified as gleyic paleoargillic brown earths.

Soils of the Chalky Boulder Clay

Where the boulder clay is found on upper valley sides it is chalky and calcareous within 0.40 m and clayey within 0.25 m of the surface. These soils are classified as calcareous pelosols and referred to the *Hanslope series*. High reserves of CaCO_3 make these very fertile soils but their clayey texture causes impedance of surface water and they remain waterlogged during the winter and spring when they are difficult to cultivate, although, unlike the Terling soils, they retain moisture through the year. Locally CaCO_3 is leached to depths greater than 0.40 m and then the *Faulkbourne series* is recognized.

Locally on plateau surfaces the boulder clay is deeply leached of carbonate and overlain by 0.50-0.70 m of stony loamy drift. Soils in these areas belong to the *Bengeo* or *Hornbeam series* and are classified as typical paleoargillic brown earths or stagnogleyic paleoargillic brown earths respectively. The subsoil clay is characteristically reddened. While these soils are lighter in the surface and easier to cultivate than Hanslope soils they are also highly acid and require liming for good crop growth.

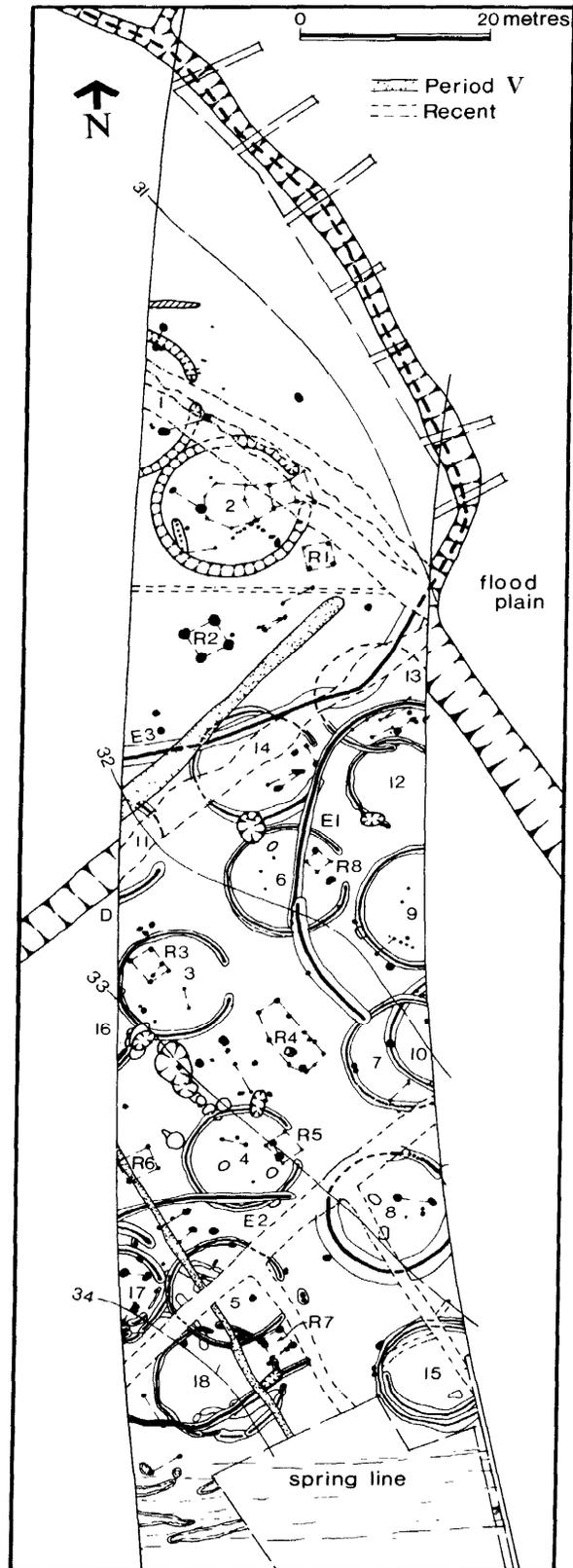


Fig 4 Little Waltham: general plan of area A. Scale 1: 750.

Site conditions

In area A (Fig 4) the Chalky Boulder Clay was found south of a spring line, caused by the interface of the boulder clay with the London Clay containing gravel pockets, the latter being particularly obvious at this point. The London Clay was exposed over the next 30 m northwards, beyond which it was capped by the Brickearth as far as the limit of flood plain erosion. To the north of this the brickearth, gravel, and clay were capped by the Recent Alluvium described below in connexion with the old course of the river (p 51).

In area B (Fig 26) boulder clay was exposed west of a line drawn between features 358 and 301. The glacial gravel beneath this clay here formed, in some areas, a thick layer which provided a bed to the hollow way. The gravel was quarried in the post-medieval period (feature 370). East of the 36.5 m contour the gravel was overlain by brickearth.

The lack of surviving animal bone points to a high acidity, although the Iron Age flora (below, p 142) suggests that the contrary was true at that time. The earliest features (Period IB), and certain irregular areas of brickearth, perhaps the sites of trees, appeared to have been 'leached' to a whitish-grey colour. The possible reasons for this are discussed by Leo Biek and John Evans (pp 6-8). Iron Age features in the brickearth could be distinguished by colour only if they contained charcoal or fired clay in an appreciable quantity; otherwise there was little difference in colour between feature fills and undisturbed brickearth. This factor made excavation, particularly the initial location of features, difficult. Whilst as a result certain features were undoubtedly overlooked, it is considered unlikely that the number concerned was appreciable, the site being observed in varying weather conditions over a considerable period of time. Observation of excavations by the contractors tended to confirm this hypothesis.

The fact that the road was to be carried on an embankment over the area concerned imposed a need to restrict excavation at subsoil level to a minimum consistent with normal technique. In other circumstances, it seems clear that an experiment—using a method of overall horizontal excavation of both features and undisturbed levels over at least a part of the site—would have been worth while, to act as a control on the reliability of the overall plan. It is hoped that it may be possible in the future to undertake such an experimental excavation on an adjoining site. The inconsistent nature of the undisturbed soil, coupled with the homogeneity of colour, and the inevitable animal and root disturbance, often made excavation and recording too subjective a process. This should be borne in mind throughout the report, especially with regard to the published sections.

In area A, north of the field boundary F254, and in area B, the topsoil was about 0.25-0.30 m deep, increasing to about 0.45 m on the eastern side of area B. Ploughing of the field south of F245 had resulted in an uneven cover of soil ranging from *c* 0.25 m on the south-west to *c* 0.75 m—a diffuse positive lynchet—at the north-east corner (eg Fig 12, C9—3). The lower layer of this accumulation (shown as loam in C9—3) contained Iron Age, Roman and medieval potsherds, the upper, more recent layer, material including coal fragments. The presence of these suggested that the rate of erosion had increased considerably in the 19th century, probably as a result of steam ploughing. Animal activity resulted in the presence of occasional Roman and later sherds in Iron Age features; these are not mentioned specifically in the text.

A grid system was adopted for recording purposes, each feature or excavated section of a feature being known by a unique numerical coordinate; only structures were serially

numbered in the field. In this report coordinates are replaced by feature numbers in the interests of clarity and space, pottery and other finds being described in relation to these feature numbers. The numbering of sections follows that of features, eg s 136 is of feature 136, a suffix being added where more than one section of the same feature is illustrated, eg s 136-2. Textual references to widths of features should be taken as widths at cleared level; depths similarly are measured from this level. The contours on the plans refer to the site after clearance of topsoil.

Examination of a representative soil section

Leo Biek and John Evans

No feature was seen during excavation, but a trial hole was dug in the brickearth at point D on Fig 4 in 1974. Samples were X-radiographed by Justine Bayley at the AM Laboratory and analysed at NELP for iron, manganese, and organic matter, and by wet sieving. The X-radiographs are compared with those of burnt clay and pottery in Pls XIII, XVIII-XXXII; the other results (Table I, Fig 5) help to explain some of the field observations, but require certain first impressions to be modified.

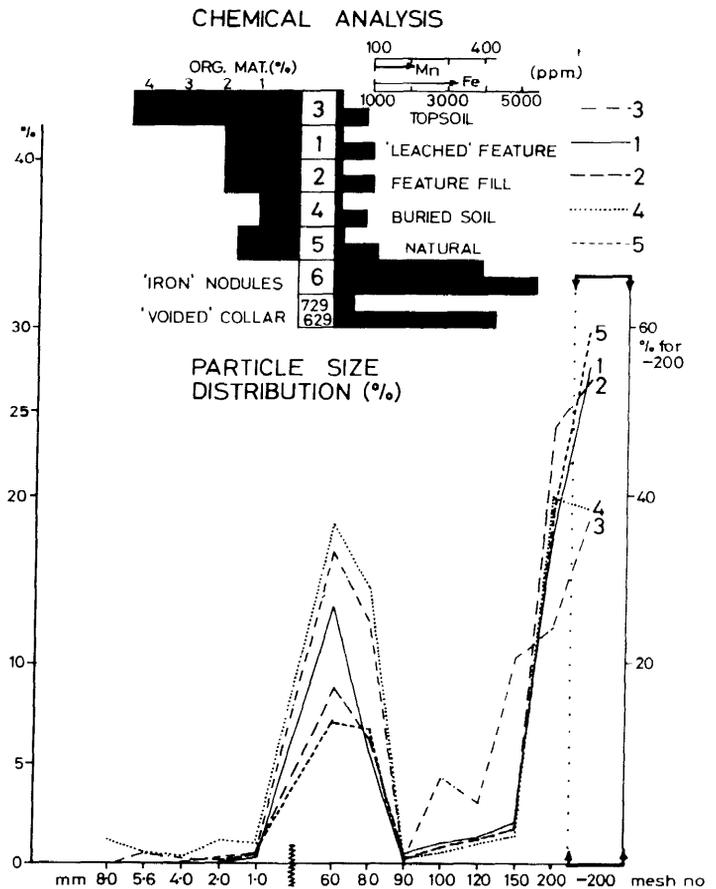


Fig 5 Little Waltham: analysis of soils from trial hole at D on Fig 4. Note physical similarities between topsoil and buried soil; also 'negative' iron profile and organic matter 'in version'

TABLE 1 Physical and chemical analysis of soil samples from test hole (at D on Fig 4), 1974

Description	Percentage (by weight) of material retained between adjacent sieves						For comparison 'Voided' iron collar AM 729629
	Leached feature	Feature fill	Topsoil	Buried soil	'Natural'	'Iron' nodules	
Sample no	1	2	3	4	5	6	
Sieve size							
+8.00 mm	0	0	0	1.55	0		
5.60	0	0	0.66	0.65	0		
4.00	0.19	0	0.38	0.35	0.08		
2.00	0.18	0.48	0.36	1.45	0.13		
1.00	0.50	0.70	0.56	1.24	0.35		
Mesh 60	13.36	8.53	16.66	18.34	8.46		
80	6.61	7.57	12.65	14.45	8.04		
90	0.13	0.27	0.44	0.33	0.45		
100	1.31	1.01	5.01	0.69	0.96		
120	1.61	1.56	3.73	1.21	1.49		
150	2.46	2.08	10.29	1.66	2.43		
200	17.89	24.04	12.18	19.93	18.70		
-200	55.16	53.76	37.08	38.16	58.90		
TOTAL	100.00	100.00	100.00	100.01	99.99		
Chemical analysis							
Organic matter (%)	1.95	1.99	4.41	1.01	1.63		
Manganese (ppm/10g dry sample)	12	10	10	10	18	397	43.5
Iron (ppm/10g dry sample)	1000	1000	790	790	1090	5455	4350

The 'acidic' nature of the brickearth is confirmed, but the 'leached' appearance of the horizon so described is not reflected in the iron or organic-matter levels. Little evidence of groundwater gleying was seen at the levels examined (down to 1 m), and it is possible that cultivation—probably continuous since the Iron Age—may have effectively restricted the expected soil development here.

The values of several pH measurements made on the samples fell between 5 and 6. A proximate comparison was made of the coarse fraction (above medium sand) in the 'Brickearth' with that in the 'London Clay', and with a sample of sand found during the excavations (cf p 30) in a pocket in the upper levels of the London Clay (presumably part of the glacial deposits). There was a superficial qualitative similarity between the two fractions but the clay contained less than a fifth of the amount present in the brickearth, and that smaller portion consisted mostly of larger material (3mm and over). Rare particles of chalk were seen in the clay. The nature and grading of the sand sample were intermediate. All three materials included 'iron' nodules, but there were proportionately far more in the brickearth. None were seen in a sample of 'Thanet Sand' supplied from Mucking which was quite distinct also, in both colour and grading, and particularly in the abundant and easily discernible glauconite. This sand gave an X-radiograph comparable to that of pottery fabric A. The roughly spherical and diffusely structured 'iron' nodules appeared comparable both visually and in radiograph wherever they occurred—in samples of brickearth and clay

(as found, and fired—p 59) as well as in the 'burnt clay' and 'coarse' pottery.

Although the boundary between exposed London Clay and Brickearth has been noted as passing roughly between huts C5 and C8, surfaces of more or less hard and intractable gravel are recorded as having evidently been met by the Iron Age diggers in wall trenches, not only for these huts but also for C9, C12, and C14, and even only 0.5 m down in the R2 postholes some 75 m further north. It is likely, therefore, that the London Clay underlies the Brickearth in this area at no great depth, however irregular the interface may be. This needs to be borne in mind when considering the ambient environment of various features and finds.

The nature, and mode of formation, of the 'iron' nodules is interesting in several ways. From experience elsewhere (eg Keeley 1977) manganese was expected to be significant; in the event, levels are seen to be both low and constant down the profile, the up to 40-fold concentration in the nodules being a valuable addition to the few available data. By comparison the corresponding concentration of iron is only 5-fold. Although iron levels are notoriously variable, this may to some extent reflect the pH and drainage regime over the period of formation.

However, it is interesting that the X-radiographic patterns in the present samples, and 'fossilized' in pottery evidently made from the same strata well over 2000 years ago, are identical within the expected range of variability. This suggests equilibrium conditions—static or dynamic—over that period within this particular framework,

and might again be seen as evidence of cultivation. Certainly the equally 'depleted' levels of iron in topsoil and buried surface would point to such a hypothetical equilibrium.

It is perhaps significant that the 'voided' iron collar AM 729629, which in a sense is also an iron nodule, shows the same order of iron concentration in oxide form—possibly indicating a tendency to develop micro-environmental domains under these conditions (see also p 9). In this case the manganese content is ten times lower than in the nodules. The 'leached' appearance, and anomalous reversal in organic matter content between the 'buried soil' and 'natural', suggests some form of redistribution—this could perhaps be associated with preferentially downward movement of the clay fraction at that horizon. Whatever the cause, it is important that visual distinctions are here totally misleading and do not reflect the iron or organic status in the normal manner to which archaeological field workers are accustomed.

A note on preservation

Leo Biek

Some consideration of the nature of the material state in which the finds are recovered is always necessary for a proper understanding of the evidence as a whole, especially where there has clearly been differential preservation. This note attempts to relate such differences to the rather meagre data that are available on the various micro-environments where they are specifically relevant. Broadly speaking, the most striking features are, on the one hand, the virtual absence of bone from all Iron Age contexts except C15, the lack of visible contrast normally expected from 'buried turf lines', and the manner in which a large proportion of the ironwork has been hollowed out by corrosion; and on the other hand, the general distinction between features in subsoils on the Boulder Clay, Glacial Gravel, London Clay, Brickearth, and Alluvium, exposed in that order down the valley slope.

In view of the marked superficial and nominal differences between the soils (p 5) it is tempting to link them directly with the observations on the finds. Closer study shows, however, that the situation is far more complex. In particular, the botanical remains from Iron Age levels on the Brickearth completely fail to reflect the expected habitat. Also, there are certain anomalies in the states of some iron objects, notably those from the well. Although as usual there is a lack of adequate material and data for proper comparison, the problems raised by the evidence need to be considered in some detail.

Apart from giving the ecological background, the botanical evidence (p 142-8) can also be used to indicate the nature of the soil substrates. Thus it is clear that the residues in the Roman well were derived from vegetation on the surrounding Boulder Clay. Gay Wilson (pers comm) deduces that less than 3% of the identified species could possibly be used as 'acid indicators'; none of the records can be used to postulate acid soils. On the contrary, about 50% of the listed species are obligate or preferential calcicoles—in the circumstances a very high proportion. More precisely, the two principal habitats indicated are grassland or pasture that was probably calcareous, actually surrounding the well, and wetlands near the river that were non-acid or even base-rich.

The evidence from Iron Age contexts (hut C11) is admittedly far less emphatic, partly because the quantity is less than 7% of the number of specimens isolated from the well sludge, and partly because most of the material is

charred. However, some 'fossils' survived evidently under semi-waterlogged conditions; and there is no reason to regard any of the species as acid indicators any more than the Roman specimens are. A third was made up of cereal grains; at least one species of the remainder—mostly 'weeds' of both pasture and arable land—is especially characteristic of neutral or basic soils (pH 7-8.5). It is true that at least three of the fifteen or so non-cereal plants 'often grow on light or sandy soils', but that is as far as one can go in an attempt to reconcile this evidence with the conditions in the studied section.

It may be that the cereals, and other 'diagnostic' specimens, were brought to hut C11 from nearby land on the Boulder Clay—or even on the London Clay (in which some fragments of chalk were found: p 7)—especially as nearly all of the non-cereal 'weeds' are known 'to have been used as food in prehistoric times'. But there is another curious factor to be considered. It was to be expected that the well sludge had a pH of 7 and contained limestone pebbles, as well as bones, shells, etc. It is less clear why the three samples from the wall trench of hut C11 in the Brickearth area should consist of 'slightly calcareous' clay that effervesces with dilute acid and has a pH of 7 (Gay Wilson, pers comm). It is also noteworthy, if perhaps somewhat less surprising in view of the implicit biological activity, that the basal mud in the abandoned river than nel—like the well sludge—had a pH of 7: but it, too, contained limestone fragments (p 146).

Thus it may be necessary to consider a 'horizontal' as well as a 'vertical' interface between the brickearth and other deposits here, too (see p 7). Although it is in the circumstances just conceivable that the calcareous element in C 11 wall trench derives from residual ash, it would seem unlikely; and this is the only sampled wall trench. One is then faced with the possibility of a neutralized surface zone on the Brickearth, due to downwash—or at least run-off—from the Boulder Clay, and this is likely to be most prominent in depressions such as wall trenches and pits.

The condition of the burnt and fired clay made any appraisal of material state impossible; there was no evidence, however, for any differential effects due to burial. Certainly there was no suggestion of the (chalky) boulder clay having been used to make any of the pottery. Although two fragments of burnt clay were supposed to have originated from the area of the Boulder Clay no firm conclusions could be drawn from their examination (see also in relation to 'volcanic inclusions', p 62). No cob or similar calcareous daub material was recognized among the burnt wall fragments.

A group of once partly shell-tempered pots was noted in a medieval context in the clay of area B (p 92); but as its 'shell' grit was missing mainly from the inside of what were, after all, cooking pots it is as likely that the 'shell' was 'boiled out'—as it is known to be—during use.

There was a very small amount of glass from 3 distinct contexts: the upper well filling, the well sludge, and the hollow way (p 99). Their equally excellent states of preservation are noteworthy; although they all come from nominally Boulder Clay domains the 5 fragments clearly lay buried under very different conditions, and their only common factor—a slightly alkaline pH which may be expected—would, if anything, favour deterioration (eg Fletcher 1972). No comparative remarks can be made, either, about the vitreous surfaces found on the highly fired and ash-fluxed 'clay' from some areas, all on Brickearth.

The most hopeful group of material for the present study seemed to be the ironwork. Here the X-radiographs clearly showed, in general, not only severe corrosion but also a marked difference between two groups of objects. On the

one hand, the objects from the Brickearth area appeared to have been more or less completely hollowed out (Pls IV, VI), a state of affairs which has been previously noted from time to time (Biek 1956; 1963; 1969), but hardly ever under conditions permitting the close study of the ambient material that is needed. All that can be said is that the condition of the Waltham iron work found in the Brickearth area is consistent with severe and fairly rapid attack under 'acid' conditions.

On the other hand, there were a few objects which had been found in the area of the gravelly clay, or near the suspected boundary between it and the Brickearth, and these appeared from X-radiographs to be in a different, somewhat better, and certainly not hollowed, state of preservation. However, closer study showed that such differences could be accounted for by variations in technique of manufacture—for instance, a sheet or flattened fragment did not show hollowing even when buried in the Brickearth area, or at least not to anything like the same extent—and in any case there were insufficient specimens from clay areas to prove the point.

A different matrix, again, was nominally provided in the well. Here one would have expected to feel the influence of the more basic medium, due to the boulder clay, even in the upper filling—but particularly the effect of the anaerobic conditions clearly implied in the detailed report on the organic mud which must have been continually waterlogged (p 143; Biek 1963(b); 1977 (a)).

However, such ironwork as was found in the well sludge—mostly nails, and particularly hobnails significantly enough with, or even still in, their leather soles—was all hollowed out. The ultimate state was exhibited by the totally voided iron collar (p 98) which, at first sight, seemed unacceptable in this context, requiring explanation in terms of (Iron Age) corrosion in the brickearth, and later, residual deposition in the well.

Normal experience leads one to expect very good preservation of ironwork where it has been associated under anaerobic conditions with fair quantities of organic material, particularly wood and leather, that is also well preserved. However, it is known that wood and leather can fare better than associated ironwork, although the reasons often remain obscure (Biek 1972; 1977 (b)). Hollowing out of iron, sometimes on a massive scale, is best known in connexion with marine burial in shallow waters (Biek 1969; Katzev *et al* 1966); and indeed the appearance of the ironwork from the Waltham well sludge, in particular the combination of greyish-black inner layers with a rust coloured crust, is in many ways reminiscent of artefacts found just below the surface of a sandy seashore. But it would seem—also from other evidence—that the purely marine (ie chloride) factor may be irrelevant, and that it is the continuing oscillation in oxygen tension under these conditions which may have a decisive influence, acting in the main through highly localized microbiological activity. In that sense it would then be primarily water movement, whether by wave eddies or tides in the sea, or by changes in water table on land, that determined the course and rate of corrosion.

Where drainage is efficient, as for instance in the sand at Wilderspool (Biek forthcoming), the corrosion of iron produces relatively diffuse multilayers of 'concentric' envelopes around an object which is hollowed out to some extent but very often retains a (much reduced) 'solid core' (Pl V). At Waltham, as in some cases at Wilderspool (Pl VII), the process has clearly gone beyond that stage, and the outer shell is generally more compact.

Two features here are particularly remarkable and add fresh impetus to the study of these phenomena. There is

little, if any, difference between the results of burial in well sludge or wall trench, despite obvious distinctions in matrix. Also, corrosion in a more porous medium may seem to be more rapid and severe; yet at Waltham it appears to be no slower and more complete. It may be that the particular combination of texture and water movement, though less 'fierce', produces optimum potentiostatic fluctuation which is actually more aggressive.

The situation is dramatically different for animal bone remains. The material from the Roman well sludge, and even from the upper filling, as well as that from ditch fills and the burial, was predictably well preserved, down to the polish on the bone handle (Fig 62) and foetal or newborn piglet bones—all within the calcareous domain of the Boulder Clay. In complete contrast, bone appeared to be absent from all Iron Age features on the Brickearth; only teeth were noted, whose presence and condition made it clear that the associated bone must have been buried with them but dissolved away. Intermediately, bone did survive from hut C15 but not well enough to be measured; this hut lay nominally on the London Clay, but so did C5, C17, and C18 which like the other huts only produced teeth. There were a few exceptions: C11, R6, and F255 contained fragments 'identifiable' as '?Bos' from their size, and 'unidentifiable' fragments were noted from C2, C16, F127, and F165—all are in the Brickearth, though some only just (R6, F127, F165). As indicated above (p 8) a closer look is needed.

This shows at once that even the simple incidence data will not support any sweeping distinctions in the Iron Age context. Thus teeth (alone) occurred in 6 huts, but then so did bone with teeth in 3 others, and even bone without teeth in yet 3 others. In the remaining 6 wall trenches no animal remains were found, and here such negative evidence is equally significant. Similarly, out of 9 other features within the areas of the huts, 6 contained only teeth, yet 3 only bone.

If one now considers all these groups in relation to the 2 main areas it is only the teeth in the huts that seem to be preferentially (twice as frequently—4:2) found preserved in the London Clay area. In all other cases, starting with teeth in features, the frequency is exactly reversed and ironically all 3 hut finds of bone without teeth occur in the Brickearth area. Although the *relative* states and quantities of preserved material are not affected, the overall picture is considerably modified; in particular, there seems to be no obvious correlation pattern between this picture and any of the other 'likely' variables, such as type of feature, period, micro-environment, or texture and content of fill. One has to accept, therefore, that (mere) incidence is not significant, and also that some such hidden factor as the variably calcareous blanket suggested above (p 8) may need to be invoked to account for all this evidence.

Other materials of organic origin are, again predictably, found preserved only in the waterlogged well sludge and, to a lesser extent, semi-waterlogged in hut C11 wall trench—and indeed, similarly, in the abandoned river channel. The degree of preservation here is totally reflected in the detailed description of both macro- and microscopic plant remains (pp 143 and 146). The condition of this material, as also of wood and leather, in the well sludge was comparable to that of similar finds from other waterlogged deposits (Biek 1963; 1971; 1977 (b)). The principal overall distinction—in the co-existence of hollowed iron objects with well-preserved wood and leather—places Waltham well sludge into the category of just-anaerobic, just-neutral media lacking the specific corrosion inhibitors which are active under 'normally preservative' archaeological conditions of this type. Such inhibitors seem to be present, on the one hand, in

the (slightly acid) concentrates of partial degradation products from large quantities of organic material, especially polyphenols ('tannins'); or alternatively in phosphate-rich, slightly alkaline deposits (Booth 1962).

It is perhaps significant that no iron penetration into the wooden objects was observed (p 99) although there clearly had been some ingress into the leather fragments. The latter was due to the hobnails and in some areas was quite marked. Conditions in the well sludge at the time of excavation made it impossible to link the wooden objects in space with any of the iron fragments. Although both wood and iron were relatively sparse in the deposit, the lack of iron in the wood could be taken as a further reflection of only limited, if oscillating, water movement.

Indeed the most important contribution of the overall 'preservation' evidence may well lie in its indication of gently oscillating conditions. By providing liquid shifts, and consequent depolarization, with attendant 'washing' and 'mixing' but without significant, permanent change in pH or oxygen tension overall, such conditions could establish and maintain optima for metallic corrosion and dissolution of bone. Perhaps equally significant is the link, which is thereby suggested, between this activity in archaeological time and the longer-term, pedological 'gleying' type of process by which the 'iron' nodules are presumably formed.

It is worth noting that this note was completed before the soil mapping results became available. Although the main features were previously known, several of the detailed observations added interest to this study. It is hoped that the projected field work on pottery 'clays' (p 60) may provide further data also in this connection. Meanwhile, some internal contradictions remain to be resolved. It is largely a matter of depth: exactly where an artefact came to be buried in relation to local variations in interfaces between the different deposits that are known to be present; and the precise level at which some modification of a deposit, such as decalcification of the boulder clay, was developing at any time between the Iron Age and today. As a result of minor variations of this sort it is possible, for example, to have had an iron object or a bone buried in a nominally chalky boulder clay area under highly acid conditions. Some of the present observations may be due simply to this effect—like the apparent lack of correlation between state of preservation and micro-environment.

On the other hand it is clear that in certain deposits—such as the well sludge and, indeed, the abandoned river channel which corresponds more exactly with the Soil Survey's findings—conditions were actually *found* to be calcareous. Moreover, the ecological evidence for similar conditions in the catchment area (for pollen and macroflora) of the Roman well is equally convincing.

Overall, there is clearly a further factor in the prolonged periods of waterlogging which are now stated to occur for different reasons in the various parts of the area across which the site lies. Their pattern and effect in the past is difficult to assess but must have been essentially blurring and could be taken to support the suggestions for equilibria (p 7) and calcareous blankets (p 8) made above.

III Outline chronology

The salient point to emerge from the work is the evidence of occupation, though not necessarily continuous, from the Neolithic period onwards, within a radius of about 500m from the river crossing. The excavations of 1970-1 located the centre of occupation in the pre-Belgic Iron Age; the main areas of occupation in certain other periods are suggested by peripheral features within the excavated area

and the evidence of past finds. The detailed description of the excavation follows a broadly chronological pattern, divided into the following phases:

- Period IA Mesolithic activity, testified only by a scatter of flints, largely in area A (below, p 102, 118).
- Period IB Early Neolithic occupation, represented by a hearth and gully on the periphery of the excavated area, dated by associated pottery and a radiocarbon date of 3170 ± 130 bc (HAR-1087).
- Period II Pre-Belgic Iron Age open settlement, of at least fifteen huts broadly divisible by form and associated ceramic evidence into groups A, B, and C: *c* mid 3rd to late 2nd centuries BC.
- Period III Pre-Belgic Iron Age enclosed settlement to the north of the Period II settlement, comprising at least two circular huts within a palisaded enclosure. Horse-shoe shaped enclosures superimposed on the site of the open settlement appear to belong to this phase: *c* late 2nd to mid 1st centuries BC.
- Period IV A single hut and other features: the associated pottery, though mostly pre-Belgic in style, includes some early 'Belgic' material: *c* third quarter of 1st century BC.
- Period V Romano-British occupation, attested principally by field boundaries and related features: one centre of domestic occupation lay immediately east of site B, and there were others nearby, attested by previous finds.
- Period VI Early medieval occupation, in the form of a single croft at the Ash Tree Corner road junction, overlying an earlier ditch system on a different alignment: the croft dates from the 12th century.
- Period VII Late and post-medieval usage, attested by pits for the extraction of chalky boulder clay and gravel, and field boundaries.

IV The excavations

Period IB—Early Neolithic

(Figs 7, 24, and 25)

Two features, a short length of gully, 250, and a hearth pit, 251 (Figs 7, 25) could be assigned to the Neolithic period on ceramic evidence. Charcoal from the latter yielded a radiocarbon date of 5120 ± 130 bp (3170 ± 130 bc)—HAR-1087. An aceramic feature, 29 (Fig 24), seemed to be broadly contemporary; all lay on the northern periphery of the excavated area. The pottery is described below (p 51) and the significance of the material is discussed on p 118.

The gully, 250, was straight, about 0.75m wide, 0.30m deep, and more than 5.50m long. The filling was light grey silt, with reddish iron staining in the lower part; it contained flint-tempered pottery and a number of flint flakes, the latter possibly in a primary context. Whether the feature represents a gully or slot for timbers is unclear. The hearth pit, 251. *c* 1.10m \times 0.80m, survived to a depth of *c* 0.30m, three stones of appreciable size remaining *in situ*. These were quartzite, sandstone, and flint 'erratics' derived from the glacial drift deposits. There was little sign of intensive burning, consistent reddening of the brickearth showing only under the largest of the hearth stones. The stones rested on a layer of reddish-grey, iron-stained brickearth,

strikingly different in form from those of the earlier period. They were surrounded by deep drainage trenches, there being no trace of a foundation trench for the external wall; hut C2 produced a complex of posts apparently to support the roof, and seems to have had a porch extending through the gap in the drainage gully. These huts, together with structures R1 and R2, lie within an area enclosed by a simple palisade, without an accompanying earthwork. Although there is no stratigraphic connexion between the enclosure and the features within, there can be little doubt from the layout that they are generally contemporary. The two huts excavated are essentially similar and may have been in contemporary use. Some postholes, eg 13, were definitely earlier than the huts, and the two-post structures D1–D4 seem to have been earlier. It is conceivable that these lay on the periphery of a group of huts, which later expanded over them; in this case the lesser structures to the south of C2 are presumably their successors. The only feature definitely later than the circular huts is posthole 14, whose significance is discussed below (p 34).

A third period of Iron Age occupation-Period IV-is characterized by the introduction of a few 'early Belgic' vessels as the fine pottery, complementing the normal coarse wares carried over from earlier periods. The sole hut which can be assigned to this period is C5, notable for its unusual shape. The square structure, R7, alongside seems to be contemporary. The relationship of these structures to enclosure 2 is immediately clear, but the lack of pottery in the filling of its delineating trench, and the fact that pit 256 postdates it, tends to confirm that the enclosure belongs to

Period III, its site remaining sufficiently visible to determine the siting of C5.

Period II-Mid 3rd to late 2nd centuries BC

Circular huts

These are considered as three groups; A, with deep wall trenches (exceeding 0.40m); B, with shallow wall trenches (0.40m or less); and C, with shallow trenches and a truly polygonal plan. The basic information is summarized in Table 2.

Group A: Hut C8 (Figs 9, 16)

The northern part of this hut had been destroyed by the field ditch 258, although its outline was in part reflected in that of the ditch, presumably owing to the collapse of a thin wedge of wall trench filling. The eastern part lay outside the excavation; nevertheless, it was possible to define two successive phases of construction, A and B.

The wall trench of the earlier phase had been cut away completely by its larger successor, save for a small section on the north-east which crossed the entrance of the later structure. The original trench was c 0.60m deep, the positions of individual posts being discernible in the undisturbed packing in one area (Fig 16. C8–2). The upper fill

TABLE 2 Details of the circular huts

No	1 Average diameter (m)	2 Area within walls (m ²)	3 Entrance width (m)	4 Entrance bearing	5 Wall trench depth av (m)	6 Associated postholes	7 Plan	8 Sections
Period II: Group A								
C 8A	13.70	145		east	0.60	none	A 10/Fig 9	S3/Fig 16
B	13.70	145	c 5.00	29°	1.10	none	A 10/Fig 9	S3/Fig 16
C 14	12.70	125	4.40	88°	0.45	none	A 4/Fig 10	S1, S4/ Figs 12, 23
			less than					
C11	c 12.00	110	6.00	east	0.80	none	A 5/Fig 13	S1/Fig 12
C17	c 14.00	150	4.40 (P)	66° (P)	0.45	none	A 12/Fig 15	S3/Fig 16
principal phase								
Group B								
C 6	12.50	120	4.00	78°	0.30	84–6,? 87–89	A 7/Fig 17	S1/Fig 12
C 9	13.70	145	—	east	0.40	? 98, 99	A 7 Fig 17	S1/Fig 12
C 12	10.00	75	3.70	south	0.20	none	A 4/Fig 10	S1/Fig 12
C 13	c 12.50	120	4.50	135°	0.30	none	A 4/Fig 10	S1/Fig 12
C 3	12.20	115	4.00	87°	0.30	none	A 6/Fig 18	S2/Fig 14
C 16	c 11.00	90	c 4.50	N of E	0.30	none	A 6/Fig 18	S2/Fig 14
C 7	c 12.50	120	—	east	0.40	none	A 8/fig 19	S2/Fig 14
C 10	13.00	130	—	east	0.40	none	A 8/Fig 19	S2/Fig 14
C 4	11.70	105	4.00	76°	0.30	none	A 9/Fig 20	S2/Fig 14
Group C								
C 18	13.30	135	4.90 (P)	71° (P)	0.35	none	A 12/Fig 15	S3/Fig 16
C15A	13.00	130	—	east	0.40	none	A 11/Fig 21	S3/Fig 16
Period III								
C 1	(gully, est) 18.00 (wall, ?c 15.00)	c 175	(through gully) c 2.25 (ultimate)	c 85°	—	none	A 1/Fig 7	S5/fig 25
C 2	15.60 (wall, ?c 13.00)	c 130	c 3.50	c 75°	—	18–26, 31–39, 46–47	A 2/Fig 24	S5/Fig 25
Period IV								
C 5	12.00	110	c 4.25	97°	0.25	none	A 12/Fig 15	S3/Fig 16

Notes Col 1 is an average diameter on the centre of the wall trench
Col 2 is based on Col 1 less an allowance of 0.20m for half the thickness of two walls
Col 3 is the gap between the terminal wall posts, except in the case of C1 and C2, where the approximate width of the gap in the gully is given
The depth in Col 5 is below cleared level
(P) indicates that the information relates to the principal entrance

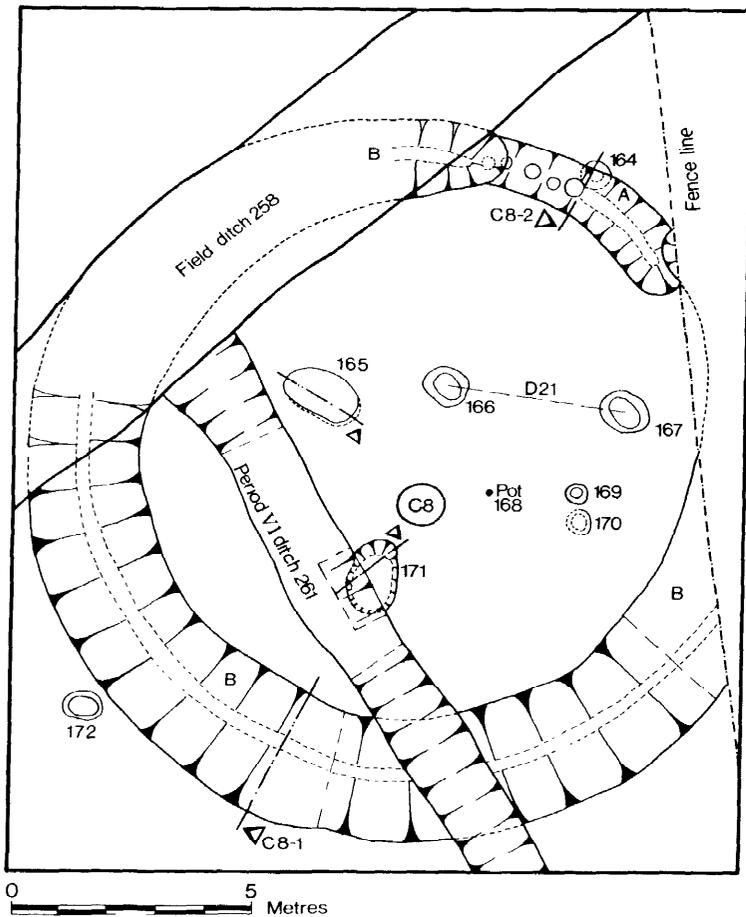


Fig 9 Little Waltham: area A 10. Scale 1:150

of this trench contained much domestic detritus—pottery, charcoal, a fragment of a conglomerate saddle quern, and burnt clay, including vitrified clay in one area in the south-western sector. The diameter of the posts suggested by the impressions ('ghosts') ranged from 0.20m to 0.35m, which may be an exaggeration of their true size. The spacing of the uprights suggests infill panels of wattle and daub.

Reconstruction took place apparently to the same diameter—at 13.70m, the largest on the site. The surprising depth of the wall trench—up to 1.10 m—perhaps implies a need to obtain a firm bedding for the timbers below the disturbance of the earlier trench. The basal width of the trench at 0.20–0.25m probably reflects the size of the timbers used. The filling was thoroughly disturbed, presumably in deliberate demolition, but the section (Fig 16, C8-1) seems to indicate the use of the excavated clay and gravel to pack the timbers in the lower part of the trench. The upper fills again contained domestic debris. There was nothing positively to connect any of the internal features with the hut; some, including pits 165 and 171, definitely belong to Period IV.

Hut C14 (Figs 10, 12, and 23)

This hut had suffered extensive disturbances from three linear features, 252, 253, and 254; erosion of the ground

along the modern ditch (254) had further damaged the surviving sections of wall trench. The differing depths of the sections of wall trench to the north and south of the entrance (0.30 and 0.60m respectively) are, however, only partly explicable in terms of erosion; it seems likely that the southern part of the hut had been totally reconstructed, the junction between the two builds having been destroyed by feature 254. The fact that the shallow section must have been, originally, at least 0.40m deep, together with the substantial deepening on reconstruction (Fig 12, C14-2), emphasizes the similarity to hut C8.

The bottom of the southern section of the wall trench was approximately level: in section C14-1, the disturbed gravel packing (the trench passes through some areas of gravel) and even a slight 'ghost' of the timbers appears. There were slight indications in plan of a terminal post not more than c 0.40m in diameter. The generally disturbed nature of the wall trench filling seems to suggest deliberate demolition. The internal postholes do not appear to be associated with the hut.

Hut C11 (Figs 12, 13)

The eastern half of this feature lay within the excavated area: of this, the northern arc had been all but destroyed by features 252 and 254, sufficient surviving to show only that

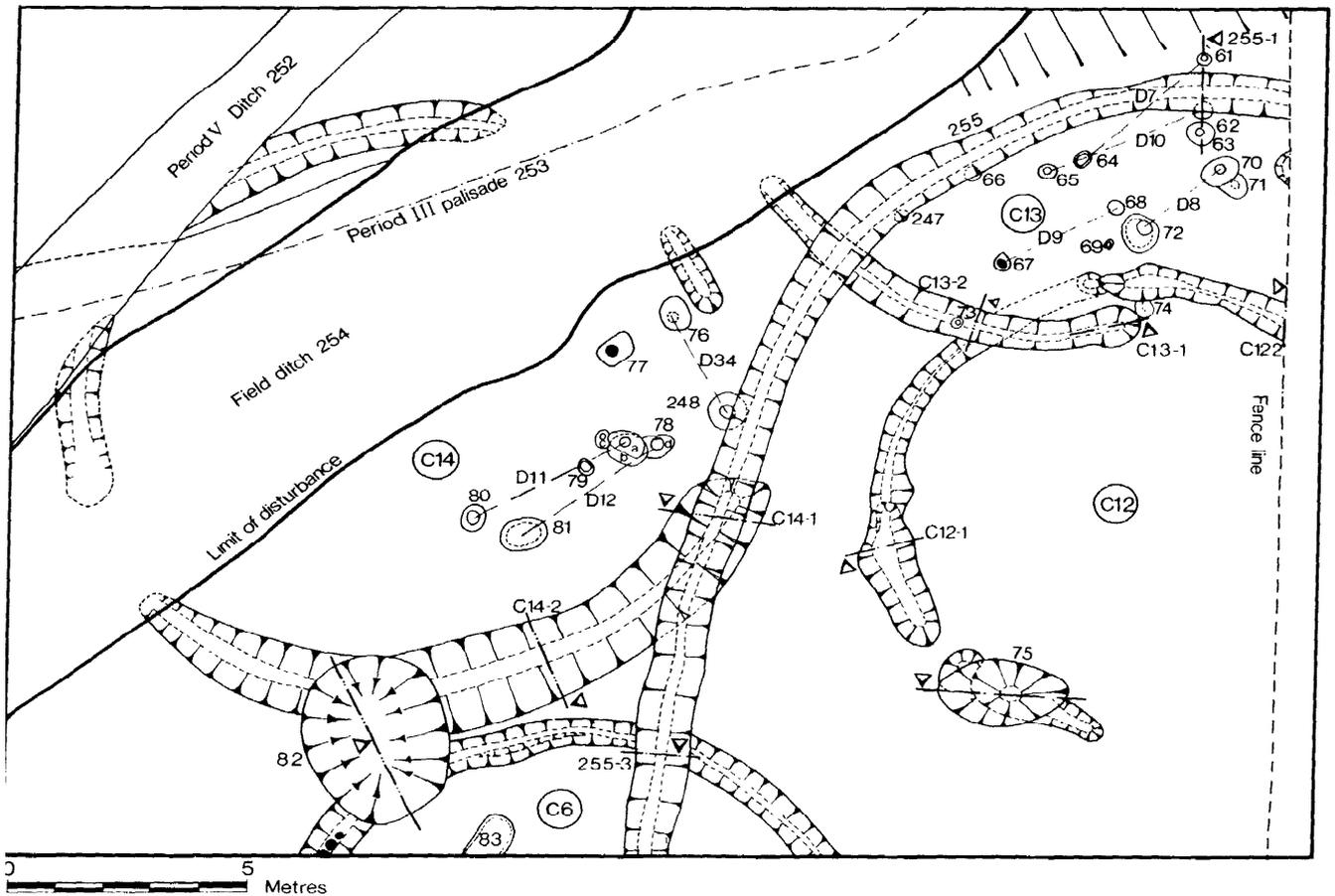


Fig 10 Little Waltham: area A4. Scale 1:150

the entrance was less than 6.00m wide. The wall trench on the south survived to a depth of *c* 0.80m (Fig 12, C11-1) and was notable principally for the quantity of burnt destruction debris in its filling. This included much burnt and vitrified daub, all with sharp breaks suggesting deposition soon after the fire; charcoal fragments, some from planks in excess of 0.20m long, and other charred vegetable matter. Preservation of a few uncharred botanical remains had evidently been assisted by semi-waterlogged conditions. The quantity of debris diminished rapidly in proportion to the distance from the butt end, the main concentration being indicated by hatching on the plan.

Despite the apparent manner of the destruction of the hut, the remains of the uprights had been removed, some of the packing tumbling into the trench bottom (Fig 12, C11-1); the organic debris followed, clearly lying more or less horizontally. Further debris had been added, including much of the burnt daub, in a brickearth-derived matrix. Four radiocarbon dates were obtained from burnt debris from this hut (see below, p 127).

Hut C17 (Figs 15, 16)

This was a complex structure of several phases, only the

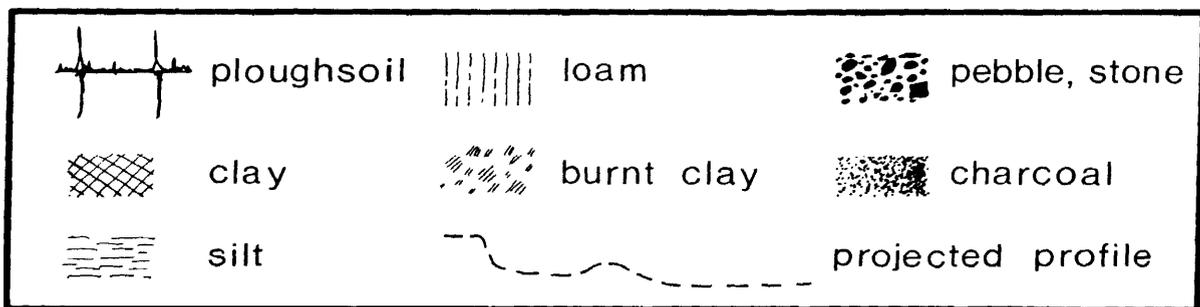


Fig 11 Little Waltham: key to sections

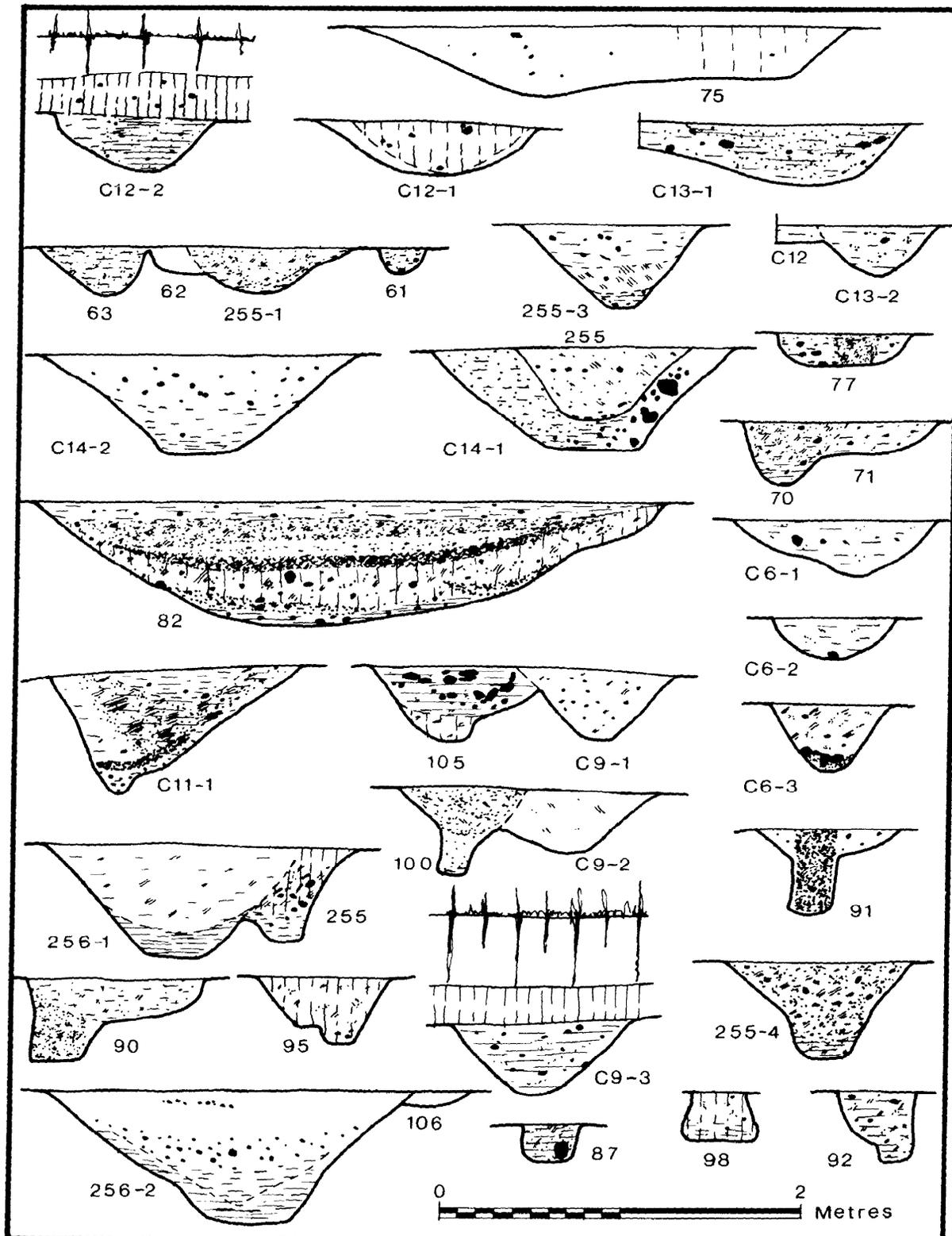


Fig 12 Little Waltham: sections 1; for key to sections, see p 16

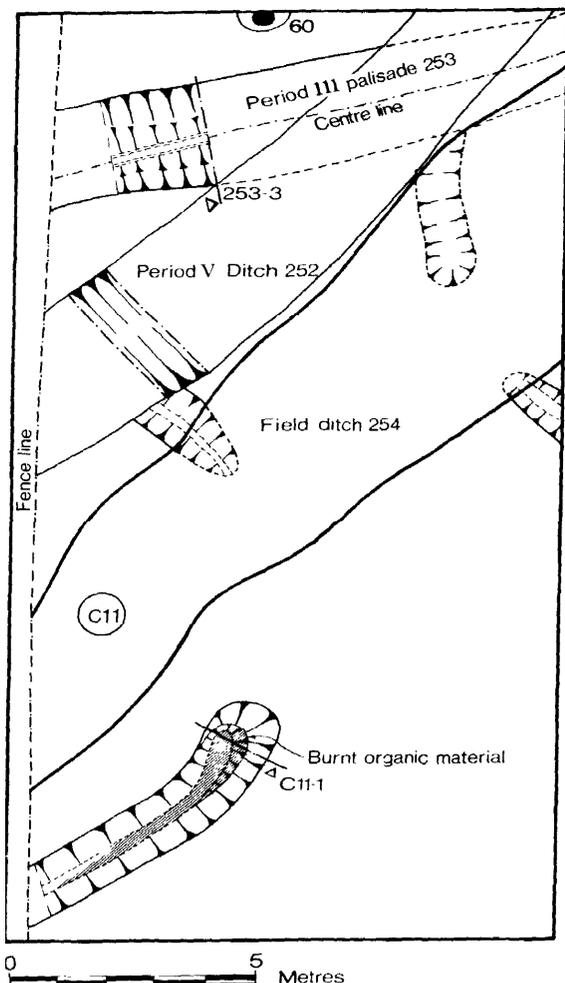


Fig 13 Little Waltham: area A5. Scale 1:150

eastern section of which lay within the excavation. These two facts make interpretation of the various features difficult, and certainly impossible.

The initial phase seems to be represented by the two sections of wall trench, A and C; section A was the deeper (Fig 16, C17-1, C5-2, C17-3), and the enlargement of the trenches both in width and depth adjoining the entrance suggests more massive construction at these points. At the southern butt end it was clear that there were two heavy posts side by side. Further south trench C stopped abruptly, perhaps indicating the presence of a second, subsidiary entrance: beyond a gap of *c* 0.70m it was presumably continued by 197 C. Feature 197B succeeded this, and 197D and E (0.20-0.30m deep) perhaps represent blockings of the gap.

The wall trench B was later than C, and presumably indicates a reconstruction of the hut as a whole. Feature 197 appears to be part of this reconstruction: if so, the hut diameter, at about 10m, was substantially less than that of the initial phase, at about 13m. Feature 197A presumably represents another section of the apparently segmented wall trench; the slot 206 (max depth 0.05m) might be broadly contemporary. If this interpretation is correct, the width of the entrance, *c* 5.0m, is greater than would normally be expected.

Group B: Hut C6 (Figs 12, 17)

The plan of this building is more of an irregular polygon than a circle. The wall trench, in some sections having significantly steep sides (eg Fig 12, C6-3), was filled with greyish brickearth-derived material with some fired and vitrified clay, mostly small fragments. It survived to between 0.25m and 0.40m in depth (C6-2). The filling was generally homogeneous, with occasional patches of darker, more charcoaly material. This remained true where the profile of the trench in the south-east, south-west, and northern sectors indicated at least partial reconstruction (C6-1). Other evidence of reconstruction was provided by the stakeholes 84-6, representing pointed stakes driven through the trench bottom, presumably to give support to an ailing structure since they do not occur elsewhere. The plan provides evidence of the use of large timbers adjoining the entrance.

Of the internal postholes, nos 87, 88, and 89 lie on an arc approximately 3.50m inside the line of the wall, and may represent roof structure supports; since the circle is not complete they may be secondary, replacing more shallowly bedded timbers. Posthole 87 included destruction debris.

The 'tree disturbance' noted on the plan was an ill-defined patch of weathered brickearth incorporating flecks of pottery, charcoal, and fired clay. The filling of 255 and 256 contained much burnt and vitrified daub in the section lying within this hut: the quantity diminished rapidly in the section to the south (downhill) and was absent from the section to the north (uphill). This seems consistent with the burnt daub being derived from levels now destroyed, associated with the destruction of the hut by fire, feature 255 having been cut through those levels. Pit 82 contained similar destruction debris.

Hut C9 (Figs 12, 17)

The western section only of this hut lay within the excavated area, thus the bearing and details of its entrance are unknown. It was defined by a simple wall trench, generally 0.40-0.45m deep, although this was reduced in the north-western sector to *c* 0.25-0.30m where the feature passed through a bed of hard gravel close to the surface. That the feature was indeed a wall trench rather than an eaves drip gully is shown by the sharp angle of the sides in C9-1 (Fig 12), impossible in a gully in brickearth, and by the nature of the filling—a darkish brown brickearth derivative—clearly the disturbed packing of the posts, with slight inclusions of fired clay, charcoal, etc.⁹ In the absence of any indication of the positions of the original posts, deliberate demolition must again be suggested. Within this hut two postholes, 98 and 99, lie some 4m from the centre line of the wall trench and may represent roof supports. The postholes were both 0.30m deep with a similar fill to that of the gully: posthole 99 had a truncated 'hourglass' profile, suggesting extraction of the post by 'rocking'.

Hut C12 (Figs 10, 12)

This hut was demarcated by a wall trench generally 0.10m deep; in the north-western sector ploughing had all but obliterated its line. The short, but complete break in the south-western sector was probably due to the difficulty of cutting through a local outcrop of hard gravel. The wider sections of the trench on the west and north, an average of 0.35 and 0.30m deep respectively, may indicate a partial reconstruction. The filling of the trench was generally a greyish silty clay with a slight admixture of charcoal,

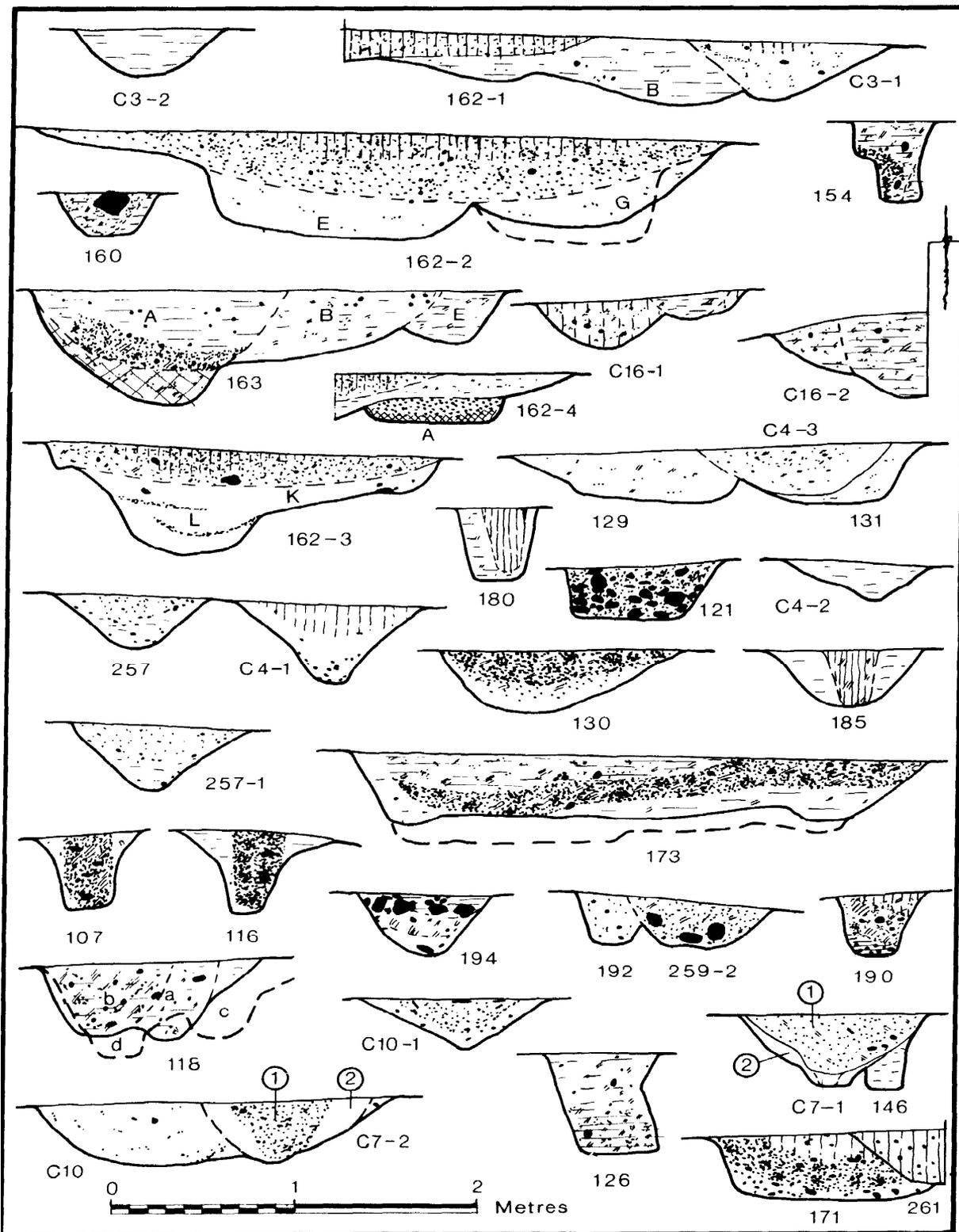


Fig 14 Little Waltham: sections 2; for key to sections, see p 16

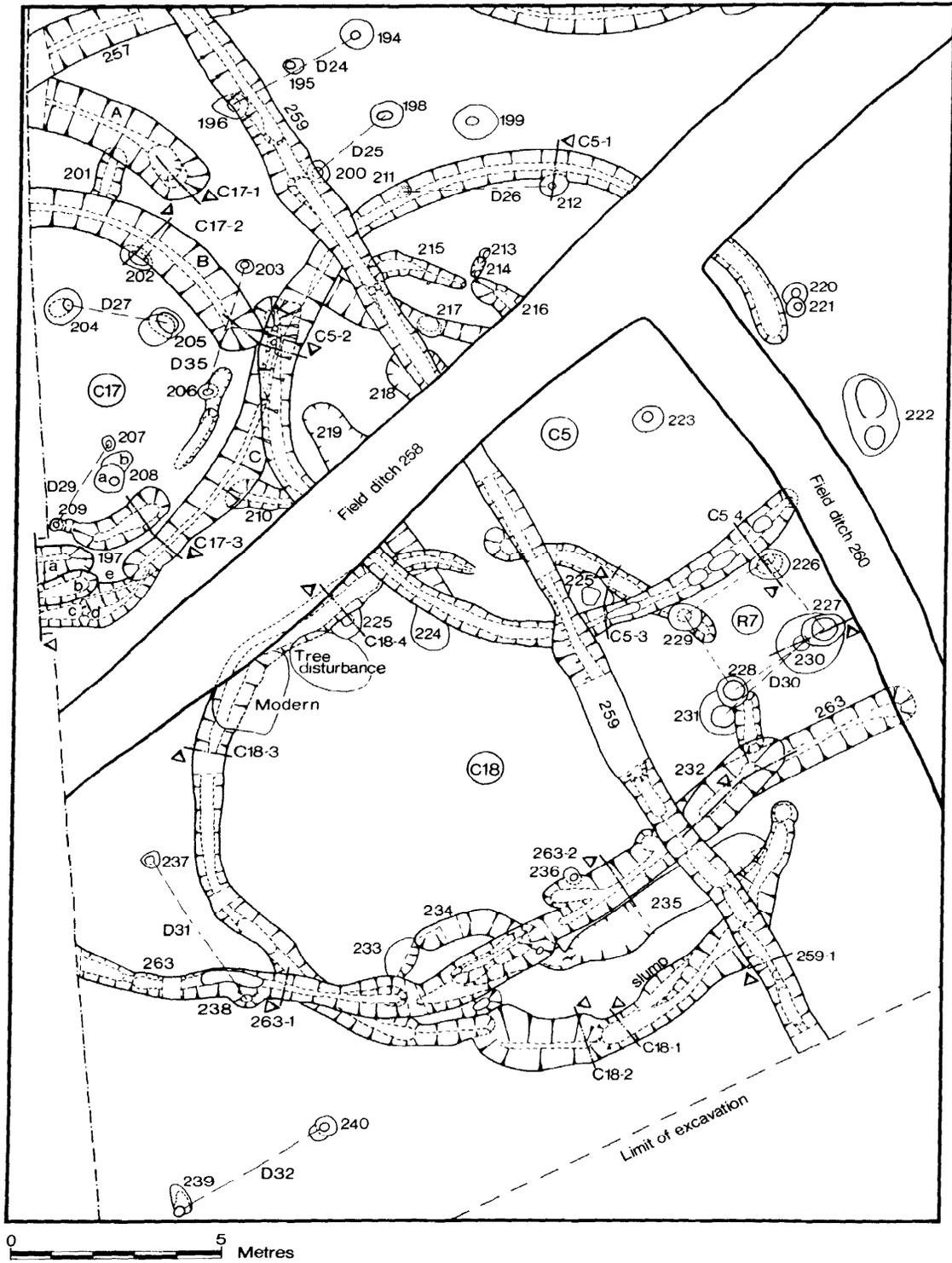


Fig 15 Little Waltham: area A12. Scale 1:150

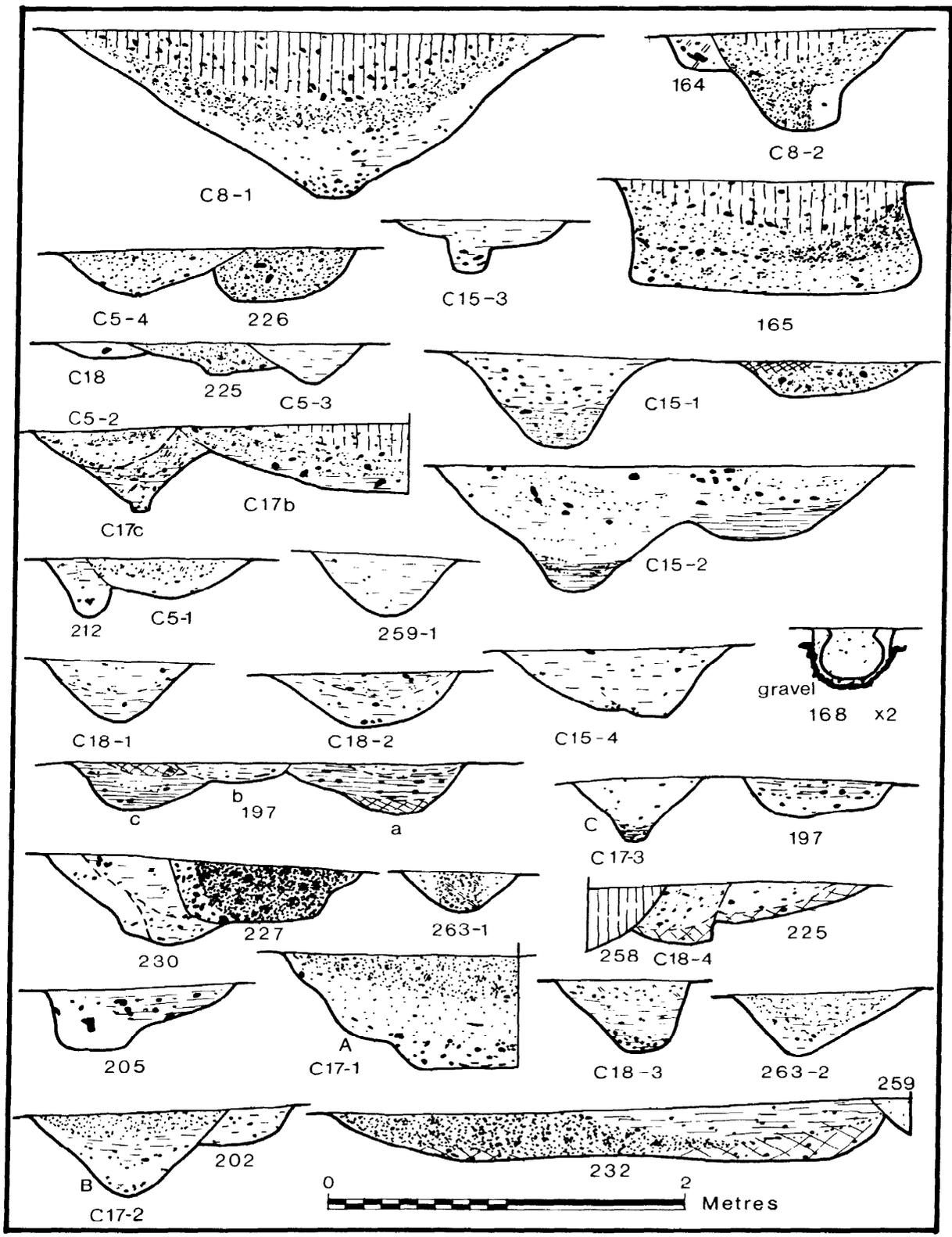


Fig 16 Little Waltham: sections 3; for key to sections, see p 16

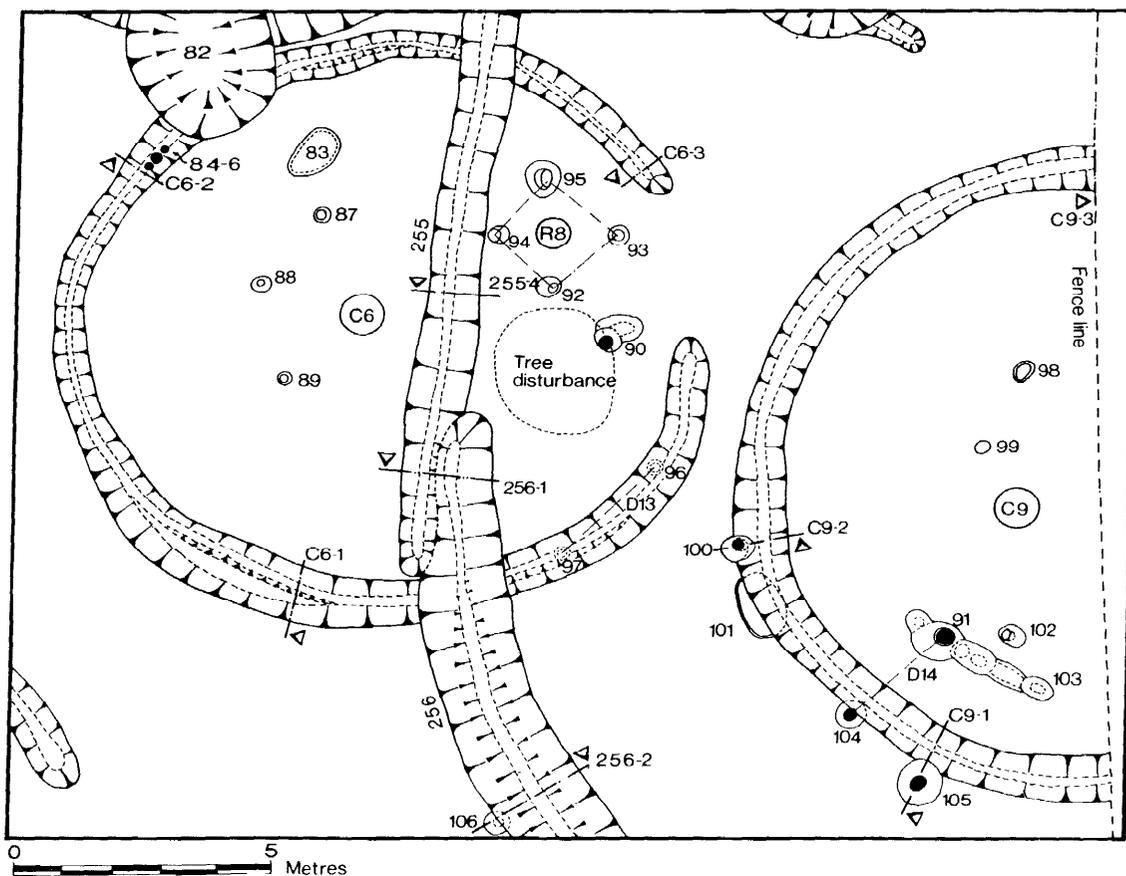


Fig 17 Little Waltham: area A7. Scale 1:150

probably representing the disturbed packing of the timbers. The section C12-2 (Fig 12) illustrates the form of the recut trench, at a point where a section of the original packing—the material initially excavated from the trench—remained *in situ*. Its presence on one side only, together with the lack of evidence of any trace of timber uprights elsewhere in the filling, suggests deliberate demolition, the posts being dug out from one side. The butt end on the south was well defined, the trench being some 0.16 m deep at this point; there was no gravel there and thus little to suggest that the southern entrance is a false impression, caused by the erosion of a very shallow trench.

Hut C13 (Figs 10, 12)

Most of this hut lying within the excavation had been destroyed by the Period III palisade and the modern field boundary. The wall trench was of relatively constant section, *c* 0.30m deep, with a filling of greyish silty clay, whose derivation is probably to be explained in the same terms as for C12 (Fig 12, C13-2). The butt ends were enlarged to take substantial posts, the depth here increasing to *c* 0.35 m. The post in the western butt appeared to have been extracted as the final act of demolition, leaving a considerable hollow which was subsequently filled with domestic refuse (C13-1). A similar concentration, also probably filling a hollow left after demolition, occurred to the west of the butt end.

Hut C3 (Figs 14, 18)

The wall trench had an average depth of *c* 0.30m, and was filled with a grey-brown brickearth derivative, probably representing the disturbed packing of the timbers; interspersed within this were patches rich in charcoal and other detritus (Fig 14, C3-1, C3-2). No evidence of individual timbers survived, though the plan indicates the use of larger timbers flanking the entrance; the trench had also been deepened at the southern abutment. There was no evidence of any reconstruction having taken place. Internal features are unlikely to be contemporary.

Hut C16 (Figs 14, 18)

Much of this hut lay outside the excavated area, though enough survived to indicate that it was of two phases. On the south the initial cut of the wall trench was *c* 0.30-0.40m deep, its filling consisting of the disturbed packing of the timbers with some charcoal and fired clay (Fig 14, C16-1). This was succeeded by a shallower trench, some 0.20m deep, filled with greyish brickearth-derived material; it stopped considerably short of the entrance, but the features 163D, E, and F might be associated with it. At the northern butt end, however, the reverse sequence appeared to be true, the deeper cut (0.50m) belonging to the reconstruction and stopping some 0.50m short of the original butt (C16-2). The entrance was probably some 4.50m

wide. Certainty is impossible since the southern abutment had been totally obliterated by the pit group 163. There were no associated internal features within the area examined.

Hut C7 (Figs 14, 19)

The western section only of this hut lay within the excavated area. The wall trench was *c* 0.40m deep, the remains of the packing of the posts, consisting of almost clean brickearth, being stratified beneath an upper filling of dark brown clayey material containing much charcoal and domestic detritus, particularly in the northern sector (Fig 14, C7-2). In the south-eastern sector this packing was sufficiently undisturbed for the settings of the individual timbers which had formed the wall to be distinguished (C7-1).

These varied from *c* 0.12 m to 0.30 m in diameter, and clearly formed not an open framework but a solid wall. The posts must have been pulled up bodily with a minimum of disturbance. The occasional gaps are probably caused by a few posts not having been rested quite on the trench bottom. Some post settings are clearly exaggerated, overlapping their neighbours in a fashion that would be impossible if they represented the exact position of the timbers, further evidence perhaps of bodily extraction. Nonetheless, a reasonable impression is probably given of the form of the wall.

Hut C10 (Figs 14, 19)

The western third only of this hut lay within the excavated area, thus again the details of its entrance are unknown. Section C7-2 (Fig 14) demonstrates the relationship to C7, and C10-1 demonstrates clearly the two distinctive layers intermittently present within the filling of the wall trench, which was *c* 0.40m deep. The lower layer represented the remains of the brickearth packing around the posts, apparently dug out on the abandonment of the building; the upper layer consisted of a loamy filling containing much domestic detritus, with which the resultant open trench was filled. No traces of post impressions could be detected in surviving areas of the lower layer.

Hut C4 (Figs 14, 20)

A similar structure to C3, defined by a wall trench an average of 0.30m deep. In some areas the disturbed brickearth packing of the original posts could be distinguished, but disturbance, presumably on demolition (Fig 14, C4-1, C4-3) was generally thorough. Slight traces of post 'ghosts' in the lower filling were observed in longitudinally sectioning the butt ends of the wall trench: the sections were unfortunately destroyed in torrential rain, immediately after excavation, before the sections were drawn. There was evidence of the reconstruction of a 3m length of the west wall; the shallow external cut is probably to be interpreted as a facing wall on the outside of the original wall (Fig 14, C4-2). The wall trench is not subcircular, but is tending towards weakly curved lengths linked by sharply curved ones. Particularly sharp angles occur some 2m south of the southern abutment to the entrance, and in the western side south of section C4-2.

None of the internal features can definitely be associated with the hut, though the shallow clay-lined pit, 175, and a buried pot much disturbed, 176, could possibly be so. It is possible that postholes 184 and 185, interpreted as a two-post structure (D22) are in fact door-posts, flanking a main entrance protected by a recessed porch; if so, this is the only

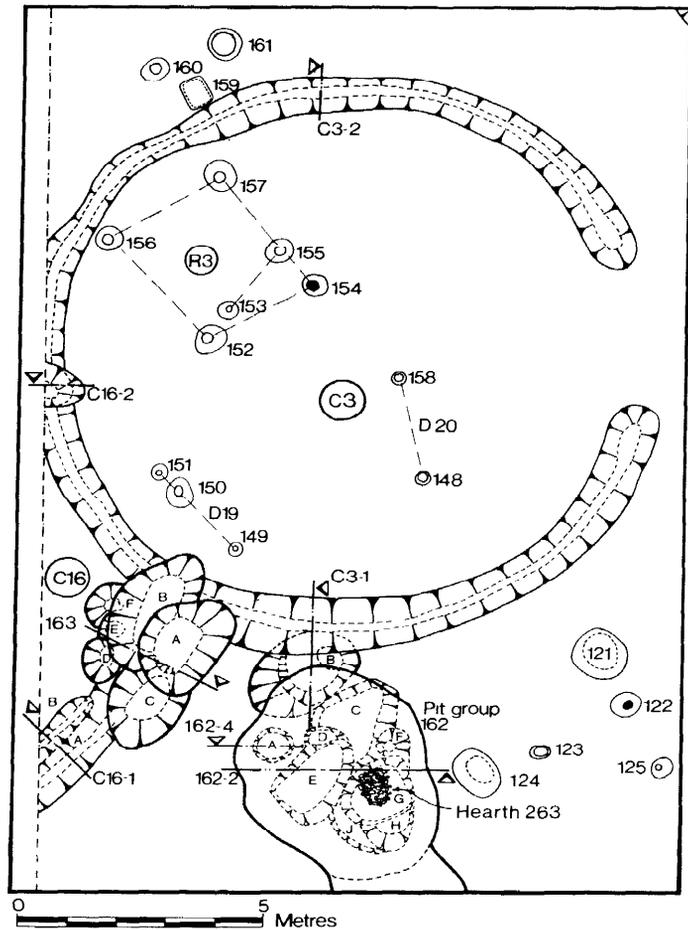


Fig 18 Little Waltham: area A6. Scale 1:150

circular¹⁰ building on the site to exhibit evidence of such a feature.

Group C: Hut C18 (Figs 15, 16)

Despite a superficially irregular appearance, this hut was a polygon between 13.20 and 13.80m in diameter. Whilst the sides were mostly of similar length, but varying between extremes of 2.60m and 3.80m, wider and less wide angles tended to alternate around the perimeter. The wall line was defined by a trench *c* 0.30-0.40m deep, filled primarily with the excavated material doubtless used to pack the timbers, with a few inclusions, for example, vitrified clay in the south and west sections¹ (Fig 16, C18-1, 3, 4).

The eastern entrance was of unusual form. The gap in the wall, *c* 4.90m wide, was divided into two parts by a length of shallow (0.25m) wall trench *c* 1.20m long. The northern opening was 1.75 m wide between posts, and the southern 1.70m wide. Since the overall width of the opening, 4.90m, in relation to a diameter of 13.50m, compares favourably with that for C8A, which had an entrance 5.0m wide in relation to a diameter of 13.70 m, it is possible that the division is a secondary feature. Such a suggestion might also explain its misalignment. The setting for a post not

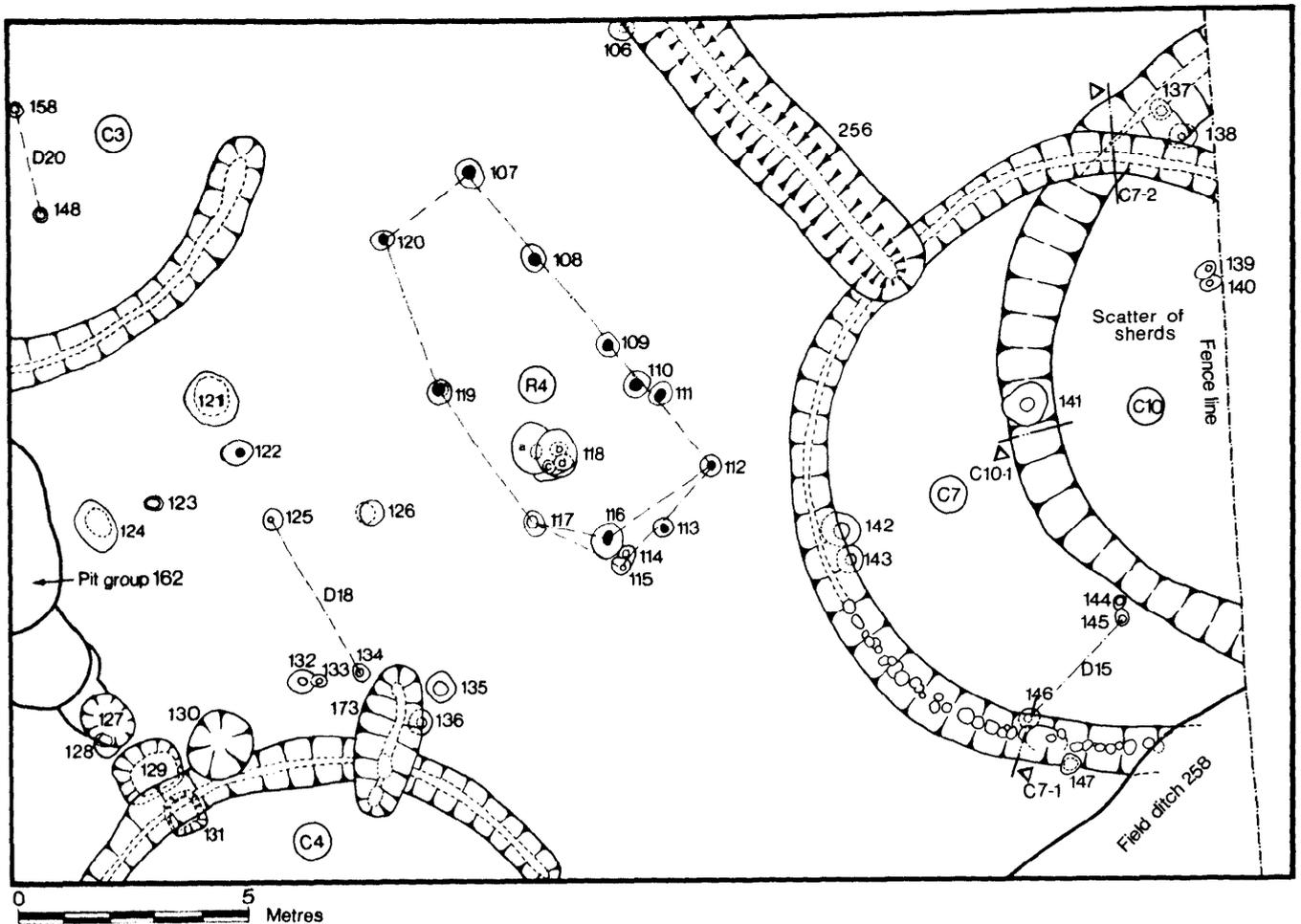


Fig 19 Little Waltham: area A8. Scale 1:150

more than *c* 0.40 m in diameter survived in the clay at the southern abutment of the entrance; it was probably an exceptionally large timber to bear the load concentrated at this point.

There appears to have been a second entrance on the south, *c* 4.50m wide. The wall trench again terminated in substantial posts, though their size was not as well defined as in the previous case. The entrance appears to have been blocked in two stages, but since both trenches had a homogeneous filling it was impossible to be certain which was the earlier. It seems probable, however, that the eastern section, at *c* 0.35 m comparable in depth to the original trench (C18-2), came first. The Western section of the blocking was represented by a shallow trench some 0.15-0.20m deep, somewhat inturbed in plan; the gap does not appear to have been fully closed. The irregularity of the main wall trench east of this entrance is probably due to the slumping of clay during construction or demolition.

A third entrance seems to have existed on the north, *c* 3.00m wide; the enlargement of the wall trenches again indicates substantial posts at the abutments. This entrance, like the southern one, was eventually blocked by a wall set in a very shallow trench, the eastern end of which had been destroyed by ploughing.

There was no indication of especially large posts at the angles of the wall; the sole clue to the form of wall construction employed was a section of the trench in the south-western sector of the hut, east of D31. A length of about 1.10 m had been cut to a greater depth than usual,

possibly marking (? the replacement of) two posts and an intervening panel. The implications of the polygonal, multi-entrance plan, and the sequence of the alterations are discussed below (p 121). No evidence was found to connect any internal features with this hut, which predated structures C5 and R7, and postdated posthole 231, and therefore D30, and probably features 224, 225, 233, and 235.

Hut C15 (Figs 16, 21)

This was a complex structure, the understanding of which was not made easier by the fact that the entrance lay to the east, beyond the limit of excavation. The initial phase clearly seems to be the outer continuous wall trench, A, which formed a more or less regular polygon about 13 m in diameter, with sides between 3 and 4m long. The trench was generally some 0.40m deep, diminishing to 0.20m on the west; the filling was mostly greyish-brown clay. Some vitrified clay occurred in one area in the centre of the west side. A deeper section (*c* 0.80m) on the south may represent a partial reconstruction; it was defined beyond the limit of excavation by the survival of an upper, slightly loamy filling, which had elsewhere been ploughed or eroded away (Fig 16, C15-2, 3).

On the north features 241 and 243 were shown by the pottery found in them to be medieval, though their filling was hardly distinguishable from that of the Iron Age

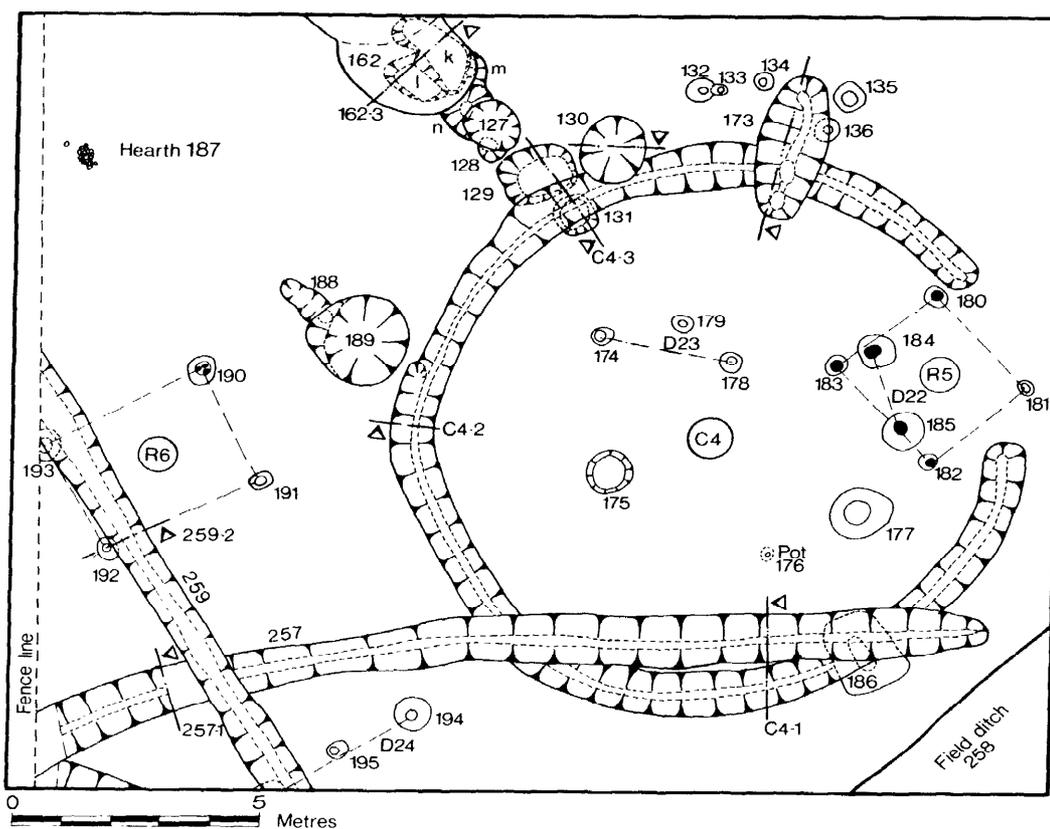


Fig 20 Little Waltham: area A9. Scale 1:150

features. Though there is no stratigraphic evidence, it seems likely that trench C represents a reconstruction of the original wall; it was some 0.05 m shallower than the original trench, with a similar filling (C15-4).

Section C15-2 indicates that trench B, on the south, is likely to be later than trench A, and it would therefore seem to be a reconstruction, perhaps contemporary with that on the north. The trench varied from 0.20m to 0.40m deep, being shallowest towards the north, where the position of the timbers was clear (C15-3). It is, however, difficult to see how a wall set in this trench could have made a satisfactory junction with the original unless a step, or a small entrance, occurred. Clearly the plan degenerated to an unusual extent in the rebuilding. The wall trenches of this hut contained a (relatively) large quantity of animal bone. local soil conditions being favourable to its preservation.

Rectangular structures

The basic information for rectangular structures of all periods is summarized in Table 3. Period II structures are as follows:

R3 Of the postholes defining this structure, 152, 156 and 157 had similar and almost homogeneous fillings of greyish brickearth with fired clay and charcoal inclusions. Enlargement of these features, together with the nature of the filling, may suggest that the posts were dug out. The post in 154 appeared to have been loosened by rocking and lifted out, leaving the characteristic 'hourglass' shape

(Fig 14). Much charcoal fell into the hole, and this, together with similar destruction material in the other postholes, may suggest a partial destruction by fire before demolition.

R4 This structure was polygonal rather than rectangular. The east wall comprised six posts in approximate line (107-12), the extreme disparity in spacing perhaps suggesting that 109 and 111 jointly replaced 110 in a partial reconstruction. Postholes 117, 119-20 clearly mark the western side, but the sequence in the south-west corner is unclear. Visually 113-15 form a reasonable corner, but these are relatively shallow, especially the two latter, 0.20m and 0.25 m deep respectively. It seems preferable to regard 116 as the corner post, and 113-5 as the result of a partial reconstruction. If this suggestion is correct, the relatively small gap between 116 and 117 —c 1.40m— may mark the position of the entrance, whilst the similar gap between 109 and 111 on the east may indicate its successor after reconstruction. Postholes 107-12, 116, 119-20 were all similar: between 0.35 m and 0.80m deep, they had contained posts 0.20-0.30m in diameter. The post packing consisted of the excavated brickearth with few inclusions, whilst the positions of the posts were marked by grey silty fill containing fired clay and charcoal, the latter particularly in 120. Posthole 107 included vitrified clay. It seems possible that the structure was destroyed by fire. Of the remaining postholes, 113 resembled the main group in all but size, whilst 114, 115, and 117 contained a greyish silty fill, similar to the 'ghost' fills of the main group, perhaps implying rodent disturbance.

R5 This was a simple structure defined by postholes 180–3. Traces of ‘ghost’ posts were present in 180–2, though these were mostly distorted and ill-defined. The packing was of the excavated brickearth, with inclusions of fired clay; the ‘ghosts’ were marked by loamy filling.

R6 This was defined by postholes 190–3, the latter two being partially destroyed by the Period V ditch 259. The fillings of all the postholes concerned consisted of collapsed brickearth packing with inclusions; in no case was a ‘ghost’ evident, perhaps implying deliberate demolition. The large pebbles forming part of the packing of 190 are probably from gravel outcrops in this area.

R8 The postholes 92–5 defined this rather small structure. They were filled with greyish brickearth, with fired clay and charcoal inclusions; no ‘ghosts’ were present, perhaps indicating deliberate demolition. The shape of posthole 95 suggested that the post had been replaced.

Two-post structures

The basic information for two-post structures of all periods is summarized in Table 4. With the exception of D1–6 and D33 lying within the Period III enclosure, and D31 and 32 apparently associated with Period IV, all are assumed to belong to Period II. In the absence of evidence to relate them to particular huts, little can be said about their siting in relation to contemporary buildings. However, the apparent concentration in the region of huts C13 and C14, though clearly not contemporary with them, may indicate a tendency to site these structures on the edge of the settlement, a tendency clear in Period III. The significance of the fact that they can be divided into four groups according to length, and tend to be aligned similarly, is discussed below (P 124).

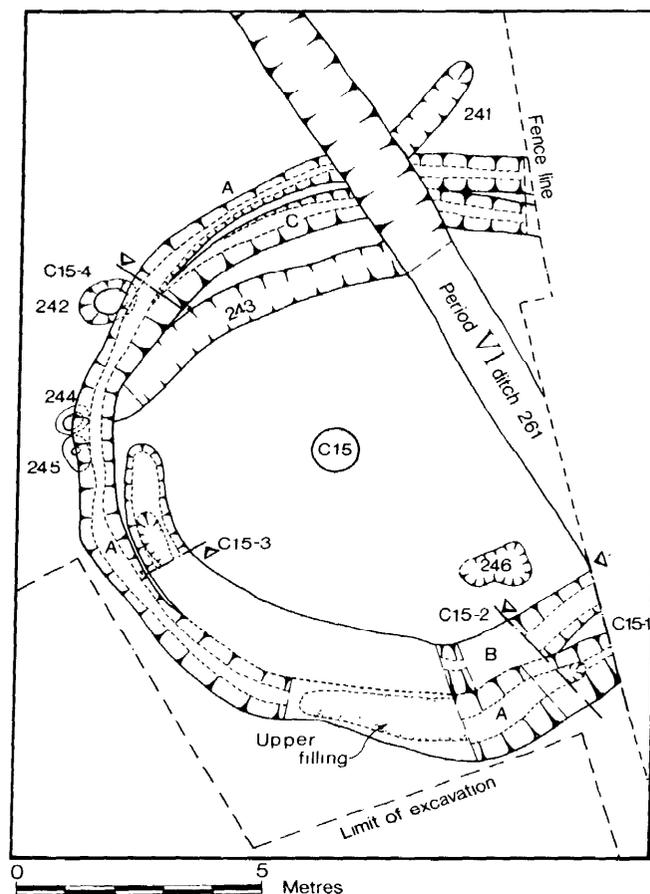


Fig 21 Little Waltham: area A11. Scale 1:150

TABLE 3 Details of rectangular structures

1 Structure no	2 Dimensions (m)	3 Ratio of sides	4 Area (m)	5 Posthole numbers	6 Average post size (m)	7 Plan	8 Section
R1	2.60 x 2.60	1:1	5.8	41, 42, 43, 44	0.20 sq	A 2/Fig 24	S4/Fig 23
R2	3.45 x 3.50 av	c 1:1	10.1	54, 55, 56, 57	0.45	A 3/Fig 22	S4/Fig 23
R3	3.10 x 2.50	1:0.81	6.7	152, 154, 156, 157	0.22	A 6/Fig 18	S2/Fig 14
R4	8.50 x 3.00 av	1:0.35	25.0 (original)	107, 108, 110, 112, 116., 117, 119, 120 (original); 113, 114, 115, 109, 111 (replacements)	0.25	A 8/Fig 19	S2/Fig 14
R5	2.80 x 2.50	1:0.89	6.0	180, 181, 182, 183	0.20	A 9/Fig 20	S2/Fig 14
R6	3.50 x 2.80	1:0.80	8.6	190, 191, 192, 193	0.25	A 9/Fig 20	S2/Fig 14
R7	2.50 x 2.30	1:0.92	4.8	226, 227, 228, 229	prob 0.35	A12/Fig 15	S3/Fig 16
R8	1.80 x 1.65 av	1:0.92	3.0	92, 93, 94, 95	c 0.20	A 7/Fig 17	S1/Fig 12

Notes Dimensions in column 1 are averages based on centre lines between postholes
 Areas in column 4 are based (with the exception of R4) on the dimensions in column 2 less an allowance of 0.10 m as half the thickness of each of two walls (0.15 m in the case of R2)
 The figures in column 6 are visual rather than strict numerical averages

TABLE 4 Details of two-post structures

1	2	3	4	5	6	7	8	9
Number	Plan	Postholes	Post diameter (m)	Depth of posthole (m)	Span between centres (m)	Span range	Alignment	Period
D1	A1	1, 2	0.37	0.47	2.70	B	17°	III
D2	A1	7, 15	0.35	0.35	4.75	—	70°	III
D3	A2	16, 27	—	0.15	3.70	C	105°	III
D4	A2	3, 30	0.25	0.32	3.70	C	82°	III
D5	A3	50, 51	0.13	0.22	2.50	B	67°	III
D6	A3	49, 52	0.15	0.30	2.60	B	58°	III
D7	A8	61, 64	0.15	0.17	3.35	C	49°	II
D8	A8	70, 72	0.20	0.38	2.00	A	50°	II
D9	A8	67, 68	<u>0.18 x 0.25</u>	0.20	2.60	B	63°	II
D10	A8	62, 65	0.20	0.17	3.45	C	68°	II
D11	A4	78a, 80	0.20	0.24	3.50	C	62°	II
D12	A4	78d, 81	0.30	0.20	3.40	C	55°	II
D13	A7	96, 97	0.20	0.62	2.65	B	45°	II
D14	A7	91, 104	<u>0.25-30</u>	0.50	2.55	B	48°	II
D15	A8	145, 146	0.12	0.43	2.90	—	45°	II
D16	A6	153, 155	0.12	0.23	1.65	—	38°	II
D17	A3	59, 60	0.30	0.35	2.40	B	168°	II
D18	A8	125, 134	0.17	0.40	3.95	D	151°	II
D19	A6	149, 151	0.10	0.14	2.35	B	138°	II
D20	A6, 8	148, 158	0.20	0.14	2.35	B	168°	II
D21	A10	166, 167	?0.45	0.30	3.70	C	100°	II
D22	A9	184, 185	<u>0.25 x 0.30</u>	0.32	1.80	A	164°	II
D23	A9	174, 178	0.20	0.14	2.70	B	104°	II
D24	A9, 12	194, 196	0.25	0.40	3.35	C	58°	II
D25	A12	198, 200	0.25	0.18	2.20	A	47°	II
D26	A12	211, 212	0.20	0.42	3.55	C	89°	II
D27	A12	204, 205	0.25	0.24	2.45	B	102°	II
D28	A12	203, 206	0.15	0.35	3.45	C	13°	II
D29	A12	207, 209	0.13	0.14	2.50	B	32°	II
D30	A12	230, 231	0.40	0.43	2.65	B	45°	II
D31	A12	237, 238	0.20	0.26	4.20	D	151°	?IV
D32	A12	239, 240	0.22	0.27	3.90	D	56°	?IV
D33	A3	45, 48	0.20	0.24	3.60	C	61°	III
D34	A4	76, 248	0.20	0.20	2.45	B	154°	II

Span ranges: A 2 ± 0.20m
 B 2.50 ± 0.20m
 C 3.50 ± 0.20m
 D 4.00 ± 0.20m

Figures underlined in column 4 are based on post 'ghosts'. the remainder being estimated from the postholes

TABLE 5 Details of postholes, area A

No	Structure	Diameter (m)	Depth (m)	Post diameter (m)	Illustrated section
1	D1	0.80 x 1.10	0.55	0.40	Fig 25
2	D1	1.10	0.40	0.35	Fig 25
3	D4	0.40	0.27	c0.25	—
4		0.15 x 0.20	0.05	SH	—
5		0.30 x 0.35	0.20	SH	—
6		c0.35 sq	0.37	c0.25	Fig 25
7	D2	0.95 x 1.20	0.35 av	ne0.50	Fig 25
8		0.25 x 0.60	0.12	SH	—
9		0.20 x 0.35	0.12	SH	—
10		0.40	0.32	c0.15	Fig 25
11		0.20 x 0.25	0.25	c0.07	—
12		0.15	0.12	SH	—
13		0.25 at base	0.42	—	Fig 25
14		c0.50	0.35	ne0.35	Fig 25
15	D2	c1.00	0.35	ne0.35	Fig 25
16	D3	0.55 x 1.35	0.10	—	Fig 25
17		0.25 x 0.30	0.20	c0.15	—
18	hut C2	0.40	0.40	0.30	Fig 25
19	hut C2	0.35	0.30	0.25	—
20	hut C2	0.45	0.40	c0.15	Fig 25
21	hut C2	0.35	0.18	c0.15	—
22	hut C2	0.30	0.24	c0.12	—
23	hut C2	0.40	0.14	?c0.20	—
24	hut C2	0.40	0.26	?c0.40	—
25	hut C2	0.55 av	0.37	c0.20	—
26	hut C2	0.55	0.30	c0.20	—
27	D3	1.10	0.20	—	Fig 25
28		0.50	0.15	?c0.20	—
30	D4	0.40	0.37	ne 0.35	—
31		0.35 x 0.30	0.16	c0.12	—
32		0.15 x 0.20	0.17	SH	—

TABLE 5 Details of postholes, area A—*continued*

No	Structure	Diameter (m)	Depth (m)	Post diameter (m)	Illustrated section
33		0.25 x 0.30	0.17	SH	—
34		0.45	0.26	c0.20	—
35		0.45	0.20	c0.15	—
36		0.35	0.23	SH	—
37		c0.60 x 0.50	0.11	ne0.30	—
38		0.50	0.20	ne0.25	—
39		0.10	0.09	SH	—
40		0.30	0.16	?0.10	—
41	R1	0.40 sq	0.36	0.20 sq	Fig 23
42	R1	0.40 sq	0.36	0.20 sq	Fig 23
43	R1	0.32 sq	0.40	0.20 sq	Fig 23
44	R1	0.40 x 0.50 rect	0.36	0.20 sq	Fig 23
45	D33	0.60	0.18	0.20	—
46	?hut C2	0.40 x 0.30	0.30	?c0.20	Fig 25
47		0.75 x 1.25	0.30	?0.30	Fig 25
48	D33	0.50	0.30	prob 0.20	—
49	D6	0.60	0.40	0.15	Fig 23
50	D5	0.45	0.28	?0.12	Fig 23
51	D5	0.40	0.16	0.15	—
52	D6	0.60 x 0.70	0.20	0.25	—
53		0.90	0.47	0.45	Fig 23
54	R2	0.90	0.50	0.45	—
55	R2	c1.20	0.50	0.45	Fig 23
56	R2	c1.20	0.50	0.42	—
57	R2	c1.20	0.55	0.45	Fig 23
58		0.55 x 0.65	0.30	0.22	Fig 23
59	D17	0.70	0.40	0.30	Fig 23
60	D17	1.00	0.30	0.30	Fig 23
61	D7	0.27	0.16	?c0.10	Fig 12
62	D10	prob c 0.40	0.16	no indication	Fig 12
63		0.55	0.30	?c0.15	Fig 12
64	D7	0.30 x 0.40	0.18	ne0.20	—
65	D10	0.35	0.18	prob 0.15	—
66		prob c 0.35	0.18	no indication	—
67	D9	c0.30 x 0.40	0.25	0.25 x 0.18	—
68	D9	c0.30	0.16	ne0.20	—
69		0.17sq	0.10	c0.10	—
70	D8	0.60 x 0.90	0.40	?c0.20	Fig II
71		0.50 x 0.60+	0.20	no certain indication	Fig 12
72	D8	0.80 x 0.90	0.37	prob ne0.30	—
73		0.25	0.24	?0.10	—
74		0.40 x 0.50	0.03	no indication	—
76		0.60 x 0.80	0.13	?c0.20	—
77		0.55 x 0.75 rect	0.20	0.25	Fig 12
78a	D11	0.50 x 0.80	0.25	?c0.20	—
b		0.75	recut	recut	—
c		0.35	0.30	?c0.12	—
d		0.50 x ?0.80	0.22	?0.30	—
79		0.30	0.13	0.18	—
80	D11	0.50 x 0.60	0.22	ne 0.25	—
81	D12	0.70 x 1.00	0.18	ne 0.50	—
83		0.80 x 1.25	0.10	—	—
84	C6	0.15	c0.30	SH	—
85	C6	0.20	c0.30	SH	—
86	C6	0.15	c0.30	SH	—
87	?C6	0.35	0.23	?c 0.20	Fig 12
88	?C6	0.35	0.17	?0.12 tapered	—
89	?C6	0.27	0.20	0.17	—
90		0.50 x 0.60	0.52	0.30	Fig 12
91	D14	0.35	0.50	0.30	Fig 12
92	R8	0.42	0.42	c0.18	Fig 12
93	R8	0.40	0.22	ne 0.25	—
94	R8	0.45	0.50	ne 0.25	—
95a	R8	0.30	0.30	ne 0.35	—
b		0.70 x 0.85	0.40	ne 0.20	Fig 12
96	D13	0.30 at surviving level	0.64	0.20	—
97	D13	0.30 at surviving level	0.60	0.20	—
98	?C9	0.35 x 0.50	0.32	prob c 0.25	Fig 12
99	?C9	0.30	0.30	?c 0.30	—
100		0.70	0.55	0.20	Fig 12
102		0.55 x 0.40	0.24	c 0.15	—
103a	contiguous group c0.50 wide		0.10	No certain indications	—
b			0.16		
c			0.15		
d			0.15		
e			0.50		
f			0.10		
104	D14	0.70	0.50	0.25	—
105		1.00	0.45	0.30	Fig 12
106		0.50	0.10	not ascertainable	Fig 12
107	R4	0.55	0.50	0.30	Fig 14
108	R4	0.50	0.50	0.27	—

TABLE 5 Details of postholes, area A—continued

No	Structure	Diameter (m)	Depth (m)	Post diameter (m)	Illustrated section
109	R4	0.45	0.33	0.25	—
110	R4	0.50	0.40	0.25	—
111	R4	0.55	0.36	0.27 x 0.20	—
112	R4	0.45	0.58	0.20 x 0.17	—
113	R4	0.40	0.28	0.12 x 0.15	—
114	R4	0.40	0.20	?c0.15	—
115	R4	0.35	0.25	?c0.10	—
116	R4	0.80	0.52	0.20 x 0.28	Fig 14
117	R4	0.55	0.35	?c0.20	—
118		complex c	c0.50 av	complex, av 0.30	Fig 14
119	R4	0.55	0.78	0.25	—
120	R4	0.50	0.54	0.20 x 0.25	—
121		1.20	0.35	ne0.70	Fig 14
122		0.55	0.33	0.17	—
123		0.25 x 0.40	0.30	ne0.20 rect	—
124		0.80 x 1.20	0.15	ne0.50	—
125	D18	0.45	0.40	0.10 (tapered?)	—
126		0.50	0.60	0.40	Fig 14
128		?0.70	0.42	?0.30 x 0.25	—
132		0.50	0.20	?c0.15	—
133		0.30	0.12	?c0.10	—
134	D18	0.40	0.40	0.17	—
135		0.60 sq	0.18	ne0.30	—
136		0.50	0.25	?0.15	—
137		—	0.34	?0.25	—
138		?0.55	0.28	?0.10 tapered	—
139		0.30 x 0.50	0.40	SH	—
140		0.30 x 0.50	0.18	?0.10 or SH	—
141		1.00	0.36	prob ne0.30	—
142		c0.90	0.28	ne0.30	—
143		c0.60	0.20	ne0.20	—
144		c0.25	0.22	ne0.15 x 0.20	—
145	D15	0.30 x 0.40	0.40	ne0.12	—
146	D15	0.40	0.46	0.20	Fig 14
147		c0.45	0.12	ne0.30	—
148	D20	0.30	0.10	ne0.22	—
149	D19	0.30	0.16	?0.10	—
150		0.55 x 0.80	0.13	?ne0.25	—
151	D19	0.35	0.12	0.10	—
152	R3	0.60	0.34	?0.22–25	—
153	D16	0.40	0.32	?c0.12	—
154	R3	0.45	0.50	c0.25	Fig 14
155	D16	0.50	0.24	c0.20	—
156	R3	0.60	0.22	?0.20–25	—
157	R3	0.70	0.40	?0.20–25	—
158	D20	0.30	0.18	0.20	—
159		0.50 x 0.70 rect	0.08	—	—
160		0.50 x 0.60	0.27	c0.25	Fig 14
161		0.70	0.12	ne0.50	—
164		?0.65	0.22	?0.25	Fig 16
166	D21	0.80 x 1.00	0.30	ne0.45	—
167	D21	0.85 x 1.05	0.30	ne0.45	—
169		0.45	0.11	ne0.20	—
170		0.55	0.40	ne0.30	—
172		0.60 x 0.85	0.30	ne0.45	—
174	D23	0.40	0.16	ne0.25	—
177		1.20	0.22	ne0.50	—
178	D23	0.50	0.12	0.17	—
179		c0.40	0.13	0.12	—
180	R5	0.45	0.45	0.22	Fig 14
181	R5	0.35	0.35	c0.20	—
182	R5	0.32	0.38	0.14 distorted	—
183	R5	0.45	0.40	c0.25	—
184	D22	0.65 x 0.75	0.30	0.25 x 0.30	—
185	D22	0.85	0.35	0.25 x 0.30	Fig 14
190	R6	0.50	0.40	?c0.30	Fig 14
191	R6	0.35 x 0.45	0.36	?c0.25	—
192	R6	0.40	0.34	?c0.20	Fig 14
193	R6	?0.70	0.40	?c0.30	—
194	D24	0.75	0.40	c0.25	Fig 14
195		0.40	0.25	0.20	—
196	D74	c0.70	0.40	ne0.30	—
198	D25	0.75	0.20	ne0.25	—
199		1.00	0.55	ne0.20	—
200	D25	?0.70	0.16	?ne0.25	—
202		?0.90 x 0.60	0.20	?ne0.30	Fig 16
203	D28	0.35	0.38	0.15	—
204	D27	0.85 x 1.00	0.15	ne0.25	—
205		0.70 x 0.85	0.36	ne0.40	Fig 16
206	D28	ne0.45	0.33	0.15 x 0.25 rect	—
207	D29	0.25 x 0.40	0.14	0.10 x 0.15 rect	—
208		0.70	0.25	0.20	—
209	D29	0.30	0.14	0.13	—

TABLE 5 Details of postholes, area A—*continued*

No	Structure	Diameter (m)	Depth (m)	Post diameter (m)	Illustrated section
211	D26	0.30 at surviving level	0.50	0.25 sq	—
212	D26	0.65	0.35	0.15 sq	—
213		0.30	0.37	0.12 x 0.20 rect	—
214		0.15 in slot 0.10 deep	0.23	SH	—
220		0.60	0.16	ne0.20	—
221		0.50	0.17	ne0.20	—
223		0.70	0.15	ne0.25	—
225		c1.00	0.28	ne0.25	Fig 16
226	R7	0.90	0.35	?c0.30	Fig 16
227	R7	1.00 x 0.80	0.35	ne0.60	Fig 16
228	R7	0.80 x 0.70	0.30	ne0.50	—
229	R7	0.80 x 0.75	0.25	c0.30	—
230	D30	1.70 x 1.50	0.60	?0.40	Fig 16
231	D30	1.20	0.26	ne0.55	—
236		?0.40	0.20	?0.15	—
237	D31	0.45	0.28	0.20 x 0.25 rect	—
238	D31	?0.70	0.25	?0.20 squarish	—
239	D32	0.50 x 0.80	0.40	0.25	—
240	D32	0.50 x 0.70	0.14	0.20	—
242		?1.20 x 0.90	—	ne0.50	—
244		?0.55 x 0.70	c0.25	ne0.35	—
245		?0.50 x 0.90	c0.25	0.15	—
247		?0.25	0.30	not ascertainable	—
248		c0.80	0.27	?ne0.30	—

Abbreviations: ne not exceeding
 rect rectangular
 sq square
 prob probably
 av average
 SH stakehole

An entry in 'Post diameter' column underlined indicates a 'ghost post'; other entries are based on the diameter of the bottom of the posthole, and probably exaggerate the true size of the post

Other features

Postholes

All postholes of Periods II, III, and IV are listed in Table 5: sections of a representative selection are illustrated. Post 'ghosts' or pipes did not survive in most cases; many posts had clearly been dug out when no longer required. In the absence of 'ghosts', an attempt has been made in the table to estimate the size of the post concerned, usually on the evidence of the size and shape of the bottom of the posthole. Sizes thus estimated are liable to exaggerate the true size of the post. Posthole 121 contained many large erratic pebbles, no doubt originally packed around the post, but later disturbed (section, Fig 14).

Pits

With the exception of the Period IV features 130, 165, 171, 173, 189, and 232 distinguished by their filling and contents, all pits in the Period II settlement are assumed to belong to Period II: they are described in Table 6.

Feature 162 originated either as an irregular excavation, or a number of small excavations which were eventually united. Some, and probably all, predate hut C3 and several bottom in an isolated patch of sand. Features 127, 129, and 131 are essentially similar; but C4 postdates the two latter features, A tentative association with the group A huts is therefore possible. The features appear to have been left to weather after excavation. The smaller feature filled up and the larger ones resolved, at least at the level surviving, into a relatively shallow hollow.¹² The filling of this contained much charcoal, but relatively little pottery, in contrast to the lower silt layer which was almost sterile. Feature 162 A predated at least the weathering phase (Fig 14). It was a small clay-lined pit, one of two on the site; the other was 175, within C4 to the south.

The pit group 163 postdates the group B huts C16 and C3; it consists of three successive large pits (A, B, C), probably all later than three small pits or postholes with no clear sequence between them. The contrasting fills of large and small pits may suggest that they are not connected-D,

E, and F could conceivably be interpreted as part of the reconstruction of hut C16, represented further south by the wall trench C16B. The fact that the positions of 163 A, B, and C coincide so closely on a site almost devoid of pits implies that the later pits were dug before their predecessors were lost sight of.

Feature 222 could be the remains of a shallow double posthole. The remainder call for no further description: possible functions are discussed below (p 125).

Gullies

In area A12 (Fig 15), in the heavy clay subsoil, a number of short gullies were found; they are described in Table 7. Feature 188 (area A9, Fig 20), which may relate to pit 189 (Period IV), was an outlier to the north. Their location might suggest a function connected with drainage (the posthole 217a need not relate to 217). Alternatively, they may be surviving sections of largely eroded hut wall trenches, but this seems unlikely in view of their irregular lines and frequently varying profiles.

Hearths

Two probable hearths were found, formed mostly of erratic sandstone pebbles somewhat reddened by heat. One, 263, lay in the upper filling of pit 163 (area A6, Fig 18); it had presumably been built when a substantial hollow still remained. The other, 187 (A9, Fig 20) lay to the south-west, at cleared level; it must originally have been constructed in a hollow.

Buried pots

A complete pot of Form 12 had been buried within hut C8, with its rim almost level with the cleared surface (feature 168; Figs 9, 16, area A10). Within hut C4, another example (feature 176; area A9, Fig 20) was found. The pot in this case had not been buried deeply, with the result that only a fragmentary base (not illustrated) survived. The fact that the only two examples of this type of feature were found within huts might suggest that they were contemporary with those huts.

TABLE 6 Details of Period II pits

Feature no	Av depth (m)	Description	Plan	Section
72	0.35	Irregular shape (? recut) with filling of weathered brickearth, containing charcoal and burnt clay flecks; slightly loamy on west	Fig 10	Fig 12
82	0.75	Regular shape, mixed fill containing much charcoal in tip lines, some burnt clay	Figs 10, 17	Fig 12
101	0.50	Subrectangular pit with vertical sides and flat bottom: filling of slightly pebbly brickearth with occasional charcoal flecks	Fig 17	—
127	0.35	Pit with steep sides and flat bottom, with a silty brickearth fill containing charcoal and burnt clay flecks, especially towards the top	Fig 20	—
129	0.30	Subrectangular pit with fill of weathered brickearth with charcoal and burnt clay	Fig 20	Fig 14
131	0.35	Pit similar to, but smaller than 129	Fig 20	Fig 14
162 A	0.30	Very charcoaly, black stiff fill above traces of yellow clay lining	Fig 18	Fig 14
B	0.40	Fill of silty brickearth with charcoal and burnt clay flecks	Fig 18	Fig 14
C	0.43	Fill of weathered brickearth with charcoal flecks	Fig 18	—
D	0.50	Ditto, possibly a posthole	Fig 18	—
E	0.70	Ditto	Fig 18	Fig 14
F	0.50	Ditto, possibly a posthole	Fig 18	—
G	0.65	Ditto	Fig 18	Fig 14
H	0.50	Ditto	Fig 18	—
J	0.30	Ditto	Fig 18	—
K	0.30	Ditto, with charcoal streaks	Fig 20	Fig 14
L	0.65	Ditto, with charcoal streaks	Fig 20	Fig 14
M	0.25	Ditto	Fig 20	—
N	0.40	Ditto	Fig 20	—
upper filling		Weathered brickearth containing much charcoal, loamy towards top	Figs 18, 20	Fig 14
163 A	0.70	Fill of charcoal and silt above clay flecked with charcoal and burnt clay	Fig 18	Fig 14
B	0.35	Fill of silty brickearth flecked with charcoal and burnt clay	Fig 18	Fig 14
C	0.60	Fill of brickearth with much charcoal above silty brickearth	Fig 18	—
D	0.40	Fill of silty brickearth with burnt clay flecks. No real sequence recovered	Fig 18	—
E	0.35	between these features-possibly a line of postholes	Fig 18	Fig 14
F	0.20		Fig 18	—
175	0.15	Weathered brickearth containing much charcoal. Traces of clay lining to sides and bottom	Fig 20	—
186	0.60	Subrectangular pit with mixed fill of tips of pebble and brickearth, some containing charcoal	Fig 20	—
218	0.20	Oval pit with flat bottom, fill of silty clay with charcoal flecks, which intensified into a patch 0.40m in diameter on the bottom	Fig 15	—
222	0.10	Shallow feature filled with brown clay flecked with charcoal and burnt clay. The northern hollow (see plan) was 0.12m deep (containing much pottery), the southern 0.08m deep.	Fig 15	—
246	0.10	Shallow hollow with greenish clayey fill containing pebble, charcoal and burnt clay flecks, and much pottery	Fig 21	—

TABLE 7 Details of Period II gullies

Feature no	Av depth (m)	Description	Plan
188	0.13	Fill of dark brown brickearth: post setting surviving under 189, 0.20m deep. may relate to this feature	Fig 20
201	0.18	Fill of greyish-brown pebbly brickearth with charcoal flecks	Fig 15
210	0.18	Fill of dark brown, slightly sandy, pebbly brickearth	Fig 15
215	0.12	Fill of brown pebbly brickearth with many burnt clay flecks	Fig 15
216	0.18	Fill of dirty orange pebbly brickearth—relates to 215 above	Fig 15
217	0.12–20	irregular gully with grey-brown silty clay fill, flecked with burnt clay and charcoal. The section includes a posthole 0.35m x 0.55m, 0.30m deep	Fig 15
219	0.20	Fill of grey-brown, sandy, pebbly brickearth, flecked with burnt clay and charcoal towards bottom	Fig 15
224	0.30	Fill of light grey-green clay with pebble—? relates to 219	Fig 15
233	0.20	Fill of grey-green clay flecked with charcoal and fired clay	Fig 15
234	0.20	Fill of grey-green clay flecked with charcoal and fired clay	Fig 15
235	0.30	Fill of grey-green clay flecked with charcoal and fired clay	Fig 15

Period III—Late 2nd to mid 1st centuries BC

The enclosure F253 (Figs 13, 22, and 23)

The Period III settlement was surrounded by F253, some 1.30m deep, where not disturbed by later features. This steep-sided trench, backfilled with clay and gravel probably arising from its excavation, would seem best interpreted as a palisade trench, the stone in the lower filling, visible in s253–3 (Fig 23) presumably being collapsed packing. The concentration of stone visible in 253–2 might be interpreted as indicating the position of a post, though in most areas the filling was considerably disturbed, suggesting that

the structure was deliberately dismantled. The ‘steps’ in the south side of s253–3 and north side of 253–2 may be due to the deliberate digging out of the timbers. There was very little associated pottery.

The feature was largely destroyed on the south-east by the modern field ditch 254, though it was possible to trace the distinct cut of the bottom of 253, including the ‘salient’ shown on the plan, under 254, despite much staining and contamination. This feature seems to strengthen the suggestion that the trench was indeed intended to contain timbers. Careful investigation of the area to the north failed to locate any contemporary features, though in view of the extent of the comparatively recent denudation here—compare

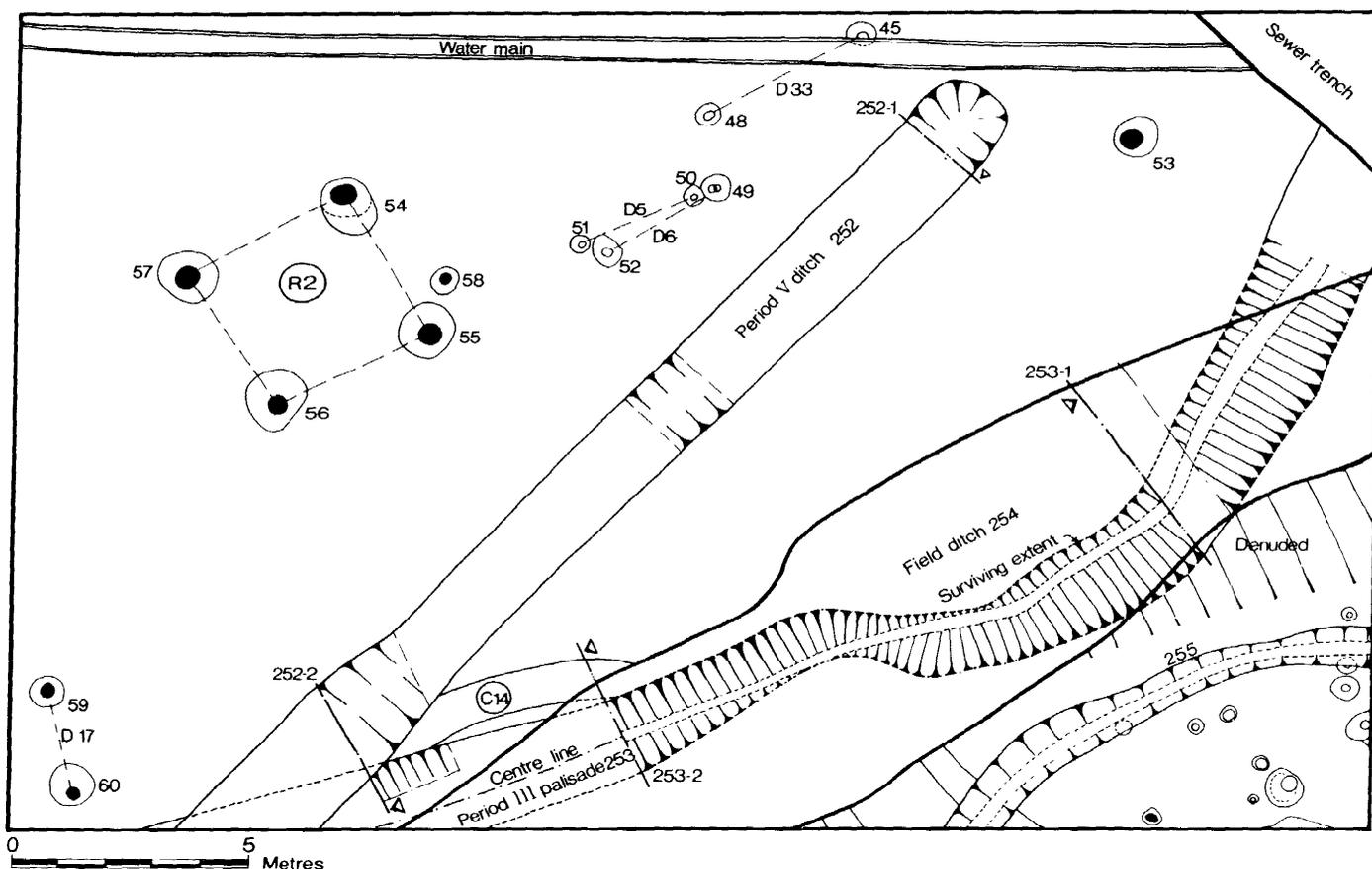


Fig 22 Little Waltham: area A3. Scale 1:150

s253—1 with s253—3—their absence is not necessarily significant. The excavated profile in s253-1, and of 253—2, is probably due to staining of the natural.

The field ditch which appeared to continue the line of the enclosing feature on the north-west was sectioned mechanically at six points. In no case was a continuation of F253 located, the ditch being sufficiently deep to have obliterated it, had it once existed. However, the feature formed a salient into the flood plain as it then stood, suggesting that its line was of considerable antiquity. Erosion by the river in flood appears to have taken place both to the north and south; this is particularly evident in the area of hut C13, which must have extended beyond the modern ditch and escarpment. It seems likely that the modern field ditch does indicate the former position of F253, though proof is lacking.

Circular huts C1 and C2 (Figs 7,24, and 25)

Huts C1 and C2 were similar, C1 being slightly the larger. The close correlation between the stratified deposits in their surrounding gullies suggests that they were contemporary, at least in occupation. They post-date some small features, eg posthole 13, and probably the two-post structures D1 and D4. The gullies were originally cut to a depth of 0.50m, with a fairly sharp profile; the slot-like appearance of the bottom in some sections, eg C1-1, C2-1 (Fig 25), may point to a regular cleaning. A fine silt, almost white (4),

eventually accumulated, and they were subsequently recut to a depth of c 0.35-0.40m, the entrance of C1 being at the same time narrowed from c 3.0 to c 2.25m (sections C1-3, C1-4). Domestic detritus accumulated in the gullies, especially adjoining the entrances; there was a concentration of pottery, and a patch of clean (probably London) clay, near the southern butt end of the gully of C2. The secondary silt (3) also contained much charcoal and some burnt clay; some of this material was definitely 'dump' rather than silt, and was tipped in from the outside. Small fragments of burnt bone appeared in this layer in the gully of C1, and two fragments of bloomery iron were found in the same layer of hut C2, in the south-west quadrant (p 115 below).

The later filling of the gullies was largely sterile brick earth-derived material, often loamy towards the top (2 and 1 respectively). No trace of a wall inside the lines of the gullies survived, and it is therefore tempting to suggest that this filling, which seems to have come from the inside, resulted from the collapse or demolition of a turf wall.

No inference can be drawn from the postholes 4, 5, and 6 within C1; they may well not be contemporary. In the case of hut C2, however, postholes 18 and 19 suggest a porch structure extending through the gap in the gully, a feature clearly absent from C1. The main structure supporting the roof of C2 appears to be indicated by postholes 20-26 and 46; the probable form of this will be discussed below. In the absence of 'ghosts', the average size of these principal

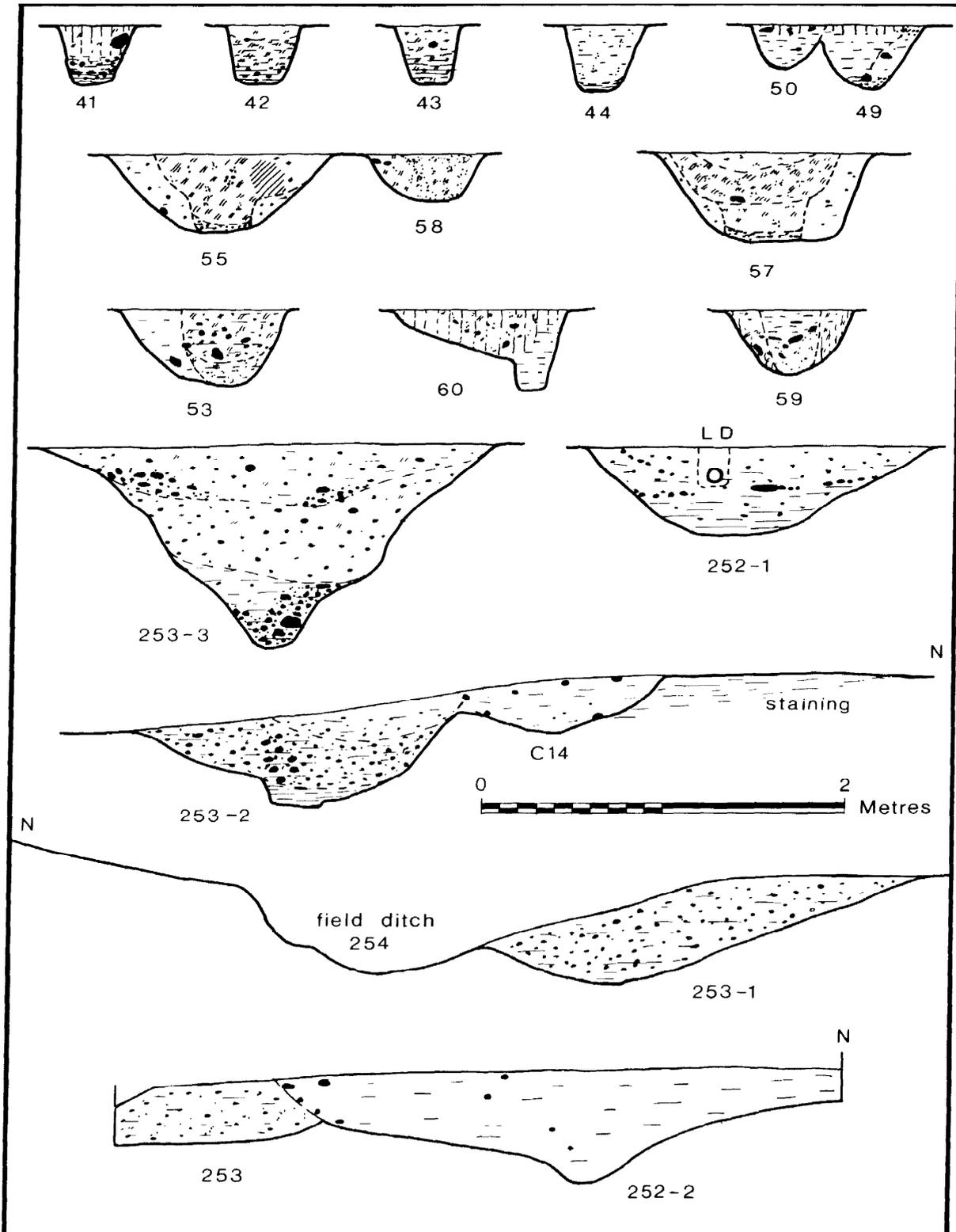


Fig 23 little Waltham: sections 4; for key to sections, see p 16

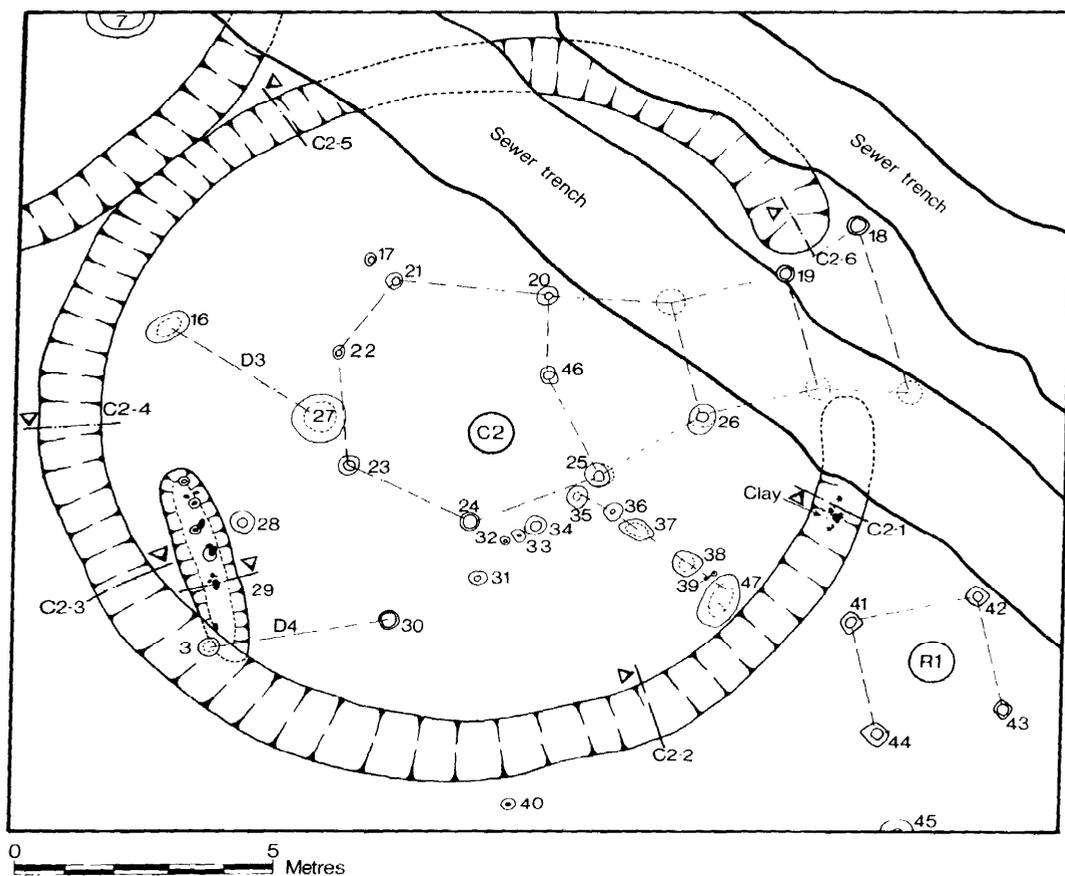


Fig 24 Little Waltham: area A2. Scale 1:150

structural timbers can be estimated at about 0.20m on the evidence of the postholes. Posthole 17 may indicate a prop under the principal rafter rising to 21. Postholes 31-39 and 47 are, on pottery evidence, Iron Age; they may indicate partitions, since alone they do not form a convincing structure.

Posthole 14 (Figs 7 and 25, C1-3) is the only feature which definitely postdates the silting of the hut gullies. It is possible that it belongs to a very late stage in the occupation of C1, when the gully had silted to a considerable extent; this need not rule out the possibility of the upper filling of the gullies being derived from the demolition of turf walls, for the post could have been either left in place during the demolition, or broken off at the surface. One posthole seems insufficient evidence from which to postulate a third phase of occupation in Period III, postdating these circular huts.

Rectangular structures

For details see Table 3 (p 26 above).

R1 (Figs 23, 24) This was formed by four posts (postholes 41-44) each *c* 0.20m square, set at 45° to the axes of the walls. The implications of this form of construction will be discussed below. The postholes, little larger than the posts which they had apparently contained, had appreciable

amounts of charcoal and burnt clay in their fillings, possibly implying destruction by fire.

R2 (Figs 22, 23) This was formed by four massive posts (postholes 54-57) each 0.45 m in diameter. They were set on gravel bedding in substantial pits, the excavated material then being packed back around them. Substantial quantities of burnt clay in the post pipes may imply destruction by fire, though this suggestion is to some extent countered by the evidence, particularly in the case of 55 (Fig 23), and on the south side of 54, that the posts were dug out. Perhaps the superstructure was partly destroyed, and subsequently demolished; alternatively, the burnt clay may be derived from another source nearby.

Two-post structures

For details, see Table 4 (p 27 above). Several two-post structures lay within the enclosure. D1, 2, and 4 are not contemporary with the huts and seem likely to predate them, though stratigraphical evidence is lacking; D3 perhaps falls into this category, unless it was internal to C2. With the exception of D4, the group appears to have been characterized by the large size of the posts—definitely 0.35-0.40m in the case of D1—which militates against their being outliers of Period II and suggests an affinity with R1.

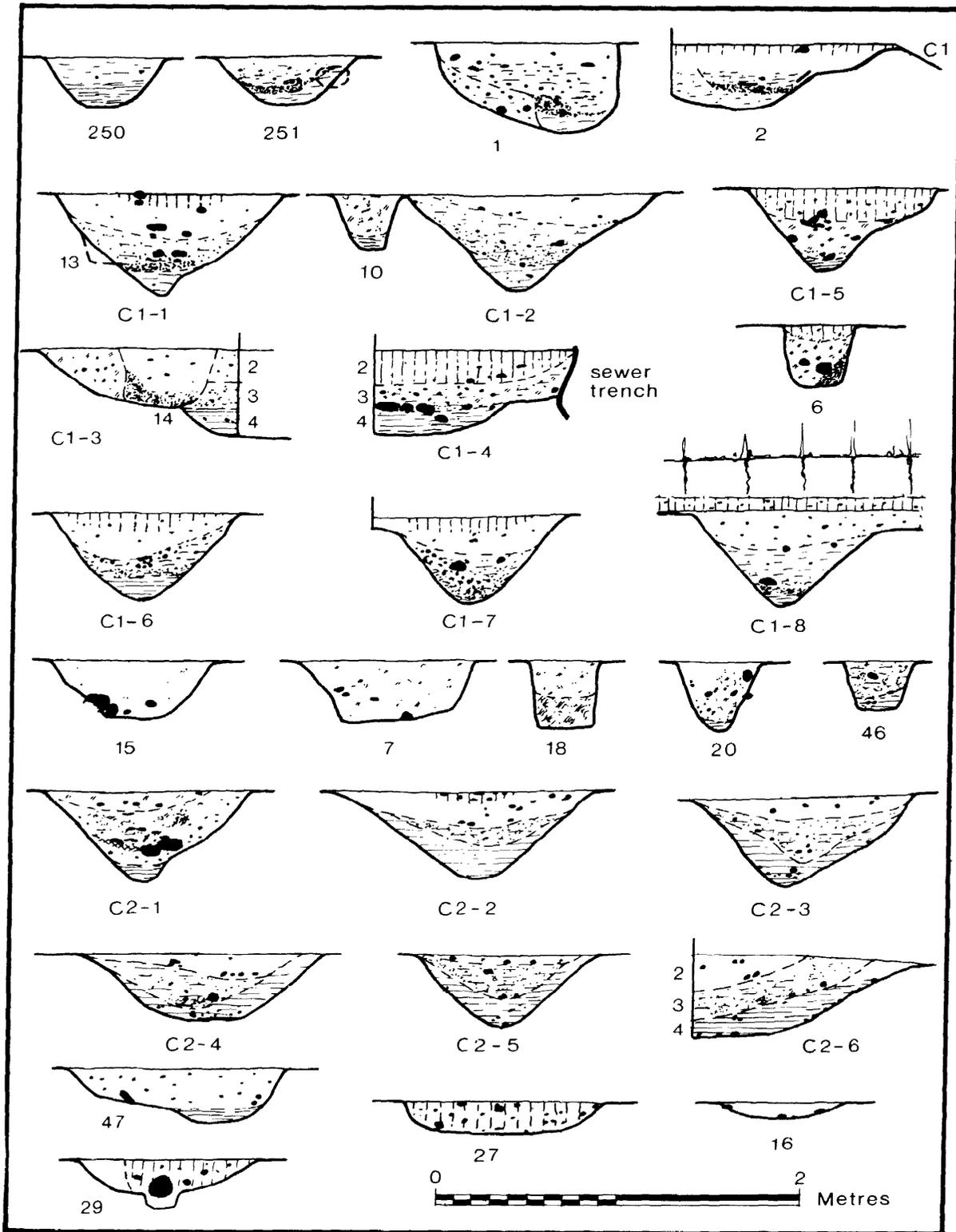


Fig 25 Little Waltham: sections 5: for key to sections, see p 16

A second group—D5, 6, 33—lies between R1 and R2. Structure D5 seems to be a replacement for D6, in which the posthole 49 shows evidence of the post having been replaced.

The horseshoe enclosures

To the south of the enclosed settlement, palisade trenches form what appear to be two enclosures of 'horseshoe' shape. These are:

Enclosure 1 (Figs 10, 12, 17, and 19)

This was defined by a trench, 255, intended to hold, on the evidence of sections 2 55-4 and 255-5 (Fig 12) timbers about 0.20m in diameter. Erosion adjoining the modern hedge and ditch 254 was responsible for its shallow depth in section 255-1. The debris from a burnt structure, found in quantity in the filling of 255 where it passed through C6, has been noted above; its localized occurrence suggests that it is not connected with the destruction of the enclosure. The mixed nature of the filling of the trench, and the absence of any post 'ghosts', suggests deliberate demolition.

The enclosure had been enlarged, and its open side presumably narrowed, by the addition of a further section, 256, on the south. The trench for this was deeper—0.80–90m compared with 0.50–60m—and in part overlapped the earlier work. Section 256-1 seems to indicate that the end of the earlier section was removed at the time of the extension. Feature 256 was almost sterile; the quantity of pottery increased towards the north, in 255, and although much clearly belonged to C6, a substantial amount was presumably deposited at or soon after demolition.

Enclosure 2 (Figs 14, 15, 16, and 20)

A trench, 257, *c* 0.30–0.40m deep (Fig 14), was complemented by another of more contorted plan, 263, some 25 m to the south; the assumed junction lies outside the excavated area, to the west. Trench 263 was cut into clay, the shape of its bottom indicating in some sections the former presence of timbers, including a larger timber at the termination on the east. Section 263-1 (Fig 16) confirmed the interpretation as a palisade trench; a pipe indicating timbers 0.20–0.25 m in diameter was defined by charcoal and fired clay flecks. The evidence of the majority of sections of both features, however, tends to imply demolition: 263-1 could be the section of a rotted post.

Other features

Postholes within the main enclosure are listed in Table 5.

Posthole 53 held a massive post 0.45 m in diameter, and thus had an affinity with R2 and D1-3. It may be the sole survivor of the posts forming a two-post structure, in view of its proximity to 252 and recent trenches. It remains a possibility that pit 82, close to the Period III enclosure, belongs to this period rather than to Period II.

Period IV—3rd quarter of 1st century BC

Hut C5 (Figs 15, 16)

This hut was defined by a wall trench generally 0.20–30m deep, normally having a charcoal-rich filling above disturbed brickearth or clay, probably the remains of the post packing. The depth diminished to *c* 0.05 m for a short section on the east in the area of a patch of hard gravel. Post settings, a few centimetres deeper than the trench generally, were located sporadically on the south. In plan it was subcircular, overall dimensions being *c* 11.50 m x 12.50m on the axes; unlike those of huts C 15 and C 18, the walls do not resolve into fairly short, straight sections, but into six fairly distinct unequal lengths, if the entrance gap on the south-east is included as one. The transition from one length to another is by a comparatively sharp curve, whilst the lengths are slightly, but significantly, curved. The hut postdated the Period II huts C17 and C18. The siting of this hut within the Period III enclosure E2 may well be significant, since the outline of the latter would have been visible for a considerable period after demolition. Two factors, however, militate against the enclosure having remained in existence during at least part of the life of the hut. Firstly, the filling of features 257 and 263 was almost sterile, in contrast to the filling of definite Period IV features; and secondly, the Period IV pit 232 was cut through the filled trench 263.

Rectangular structure R7 (Figs 15, 16)

For details, see Table 3 (p 26 above). This four-post structure (postholes 226–9) lies immediately south of hut C5, and is aligned in sympathy with it, the average distance between the wall centres being *c* 0.75 m. The postholes all retained traces of the original packing of excavated material (eg 227) but the posts had clearly been removed and the hole backfilled with clay containing much soot and charcoal. This closely resembled the upper filling of the wall trench of hut C5, and this, together with the evidence of their alignment, may imply at least partly contemporary use, and contemporary demolition. The structure postdated hut C18.

TABLE 8 Details of Period IV pits

Feature no	Av depth (m)	Description	Plan	Section
130	0.40	Small pit with filling of much charcoal and fired clay in weathered brickearth matrix, above weathered brickearth with charcoal flecks	A 9, Fig 20	S2, Fig 14
165	0.70	Oval pit with vertical sides, with a charcoal-rich filling under silt	A 10, Fig 9	S3, Fig 16
171	0.40	Oval pit with near vertical sides, similar filling to 165	A 10, Fig 9	S2, Fig 14
173	0.55	Pit with filling of silty brickearth flecked with much charcoal and pottery. The form of the bottom indicates that it was a trench for a group of timbers 2.65m long, the uprights being perhaps 0.20–0.25m in diameter. The alignment is N 15° E	A 9, Fig 20	S2, Fig 14
189	0.30	Circular pit with filling of weathered brickearth with much charcoal, and clay smears	A 9, Fig 20	—
232	0.30	Pit with charcoal rich filling, containing some silty clay; possibly a trench for timbers forming a 'drying rack' 1.85 m long, as 173 above	A12, Fig 15	S3, Fig 16

Other features

The charcoal-rich filling which characterized features relating to C5 and R7 occurred in a number of others in the vicinity not apparently of Period II. These included post-holes 237, 239, and 240, forming with 238¹³ the two-post structures D31 and 32; these seem likely, therefore, to belong to Period IV. Six pits—130, 165, 171, 173, 189, and 232—could be assigned to this period on the grounds of both filling and their distinctive pottery groups; they are described in Table 8. Features 130, 165, and 171 could be post pits, though there is little in their fillings to indicate this; both 171 and 130 are rather shallow in relation to their size. Feature 173 clearly contained a line of timbers, possibly forming a more elaborate version of the normal two-post structure. Pit 232 may have been similar, but the crucial evidence for the form of the bottom is lacking.

Period V: Romano-British

The Romano-British settlement at Waltham is centred on the junction of two main roads. The river valley route from Chelmsford to Great Dunmow (Fig 1) is almost certainly of pre-Roman origin (see p 135 below). However, the road to Braintree seems, in view of its straight course, to be wholly Roman in origin, although it may supersede a route now totally lost.

The Dunmow-Chelmsford road lay wholly beyond the excavated area, the line shown on Fig 32 being a largely hypothetical one apart from the length at 10 (p 47 below). The Braintree road passed through area B, proving to be of several phases. The other excavated features, together with those excavated by Bazett and Chapman in 1963, seem to be related to a farm, and may conveniently be considered in relation to the road phases, which were as follows:

- 1 A road continuing the alignment of the section to the north-west of the present village, defined by two ditches. On the northern frontage, a series of enclosures seem by their alignment to be contemporary. An early cremation burial, 336, lies to the south of the road, which was presumably military in conception: a date around or before AD 60 seems likely for its origin.
- 2 Subsequent neglect appears to have resulted in the road becoming a hollow way, its line diverging slightly from the earlier one upon which, by the mid-late 2nd century, an apparently domestic building had been constructed (at 2 on Fig 32). The main enclosures appear to have continued in use; further field boundaries, the well 339, a small fenced enclosure, and other minor features also belong to this phase.
- 3 By the close of the 3rd century both habitation and hollow way, together with most of the ancillary features, had gone out of use. The road was probably reconstructed on a new line to the north, the pre-bypass line of the A131. A few field boundaries in area A may have continued in use. Evidence from site 5 to the west indicates that the settlement as a whole continued well into the 4th century at least.

Description of the features excavated in 1970-1

The road (Figs 26, 27, and 29)

The original line of the road, phase 1, was defined by two parallel ditches, 349 and 352, some 13.5 m apart. The inevitable recutting of 349, which survived to an average

depth of only about 0.15 m, appears to have taken place on the original line, whilst a recut of the southern ditch, whose remains were equally slight, adopted a divergent line represented by 351 and 353. A gap 4 m wide gave access through 349 into the field to the north, whilst a gap 2.40m wide gave access through 351 and 353 to the south, over the silted or backfilled 352. The termination of 353 on the west implies a substantial gap in the cut, 17-20 m wide, the purpose of which is uncertain, although if the original ditch 351 had been continuous in this area modern ploughing would have removed all trace of it. Material recovered from these features, generally filled with silty clay, was limited in quantity. The pottery suggests that 349 and 353 remained in use into the 3rd century, whilst 351 went out of use during the 2nd century. Ditch 353 contained smithing slag (p 115), charcoal (p 116), and iron objects 5.33, 34 (P 98).

Neglect of maintenance on a steep slope, on which springs are prone to appear in wet periods, would soon lead to erosion of the metalling. Passing traffic would tend to assist the process, but, since the subsoil here is largely gravel, the result even of severe erosion would still be a tolerable surface. It appears that during the 2nd century such a process took place, resulting in the formation of a hollow way, 350, up to 0.40m deep—road phase 2. Within the excavated area this diverged south of the phase 1 line, avoiding the habitation area apparently of late 2nd century origin, although which was the cause and which the effect is unknown. The pit 361, a maximum of 0.25 m deep with a filling of dark grey silty loam, clearly belongs to phase 2, since it lies within the phase 1 road enclosure. Pits 366 and 368, encountered in trial trenching, were not further excavated; surface pottery suggested a 2nd-3rd century date.

Towards the close of the 3rd century, the hollow way was itself allowed to silt; at the western end there was perhaps some deliberate tipping of domestic rubbish. A quantity of pottery, together with six barbarous radiate coins (two found by Chapman in 1963) provided adequate and independent evidence of the date. However, since it is highly unlikely that the route between Chelmsford and Braintree ceased to be used at that time, the hollow way must have been replaced by another route. Following the 1970-1 excavation, there are two possibilities for such a line, assuming that the road from Braintree still approached the river at approximately the same point. One would be in a south-westerly direction from the crossing, obliquely up the valley slope, but this seems unlikely given the general configuration of roads in the area; the other is the line of the A131 prior to the construction of the bypass. The section of this road which passed through the area investigated was itself a hollow way up to 2 m deep, which probably developed in the medieval period. This seems the most likely line for the road in the 4th century, the line which persisted, as might be expected, into the medieval period.

The Burial, F360 (Fig 28)

A single well-furnished cremation burial was found 25 m south of the road, in an area badly denuded by post-Roman ploughing. The fact that ditch 265 appears to have passed over it implies that the deposit was originally buried at some depth: if it was once surrounded by lesser burials these have disappeared without trace.

The grave was approximately 0.75 m square, with steep sides; it survived to a depth of some 0.15 m below the base of the ploughsoil. On the bottom were arranged eight vessels—two flagons, a *terra nigra* cup and platter, two butt beakers, a small native jar, and a cup of similar fabric. The west corner was empty, presumably having once con-

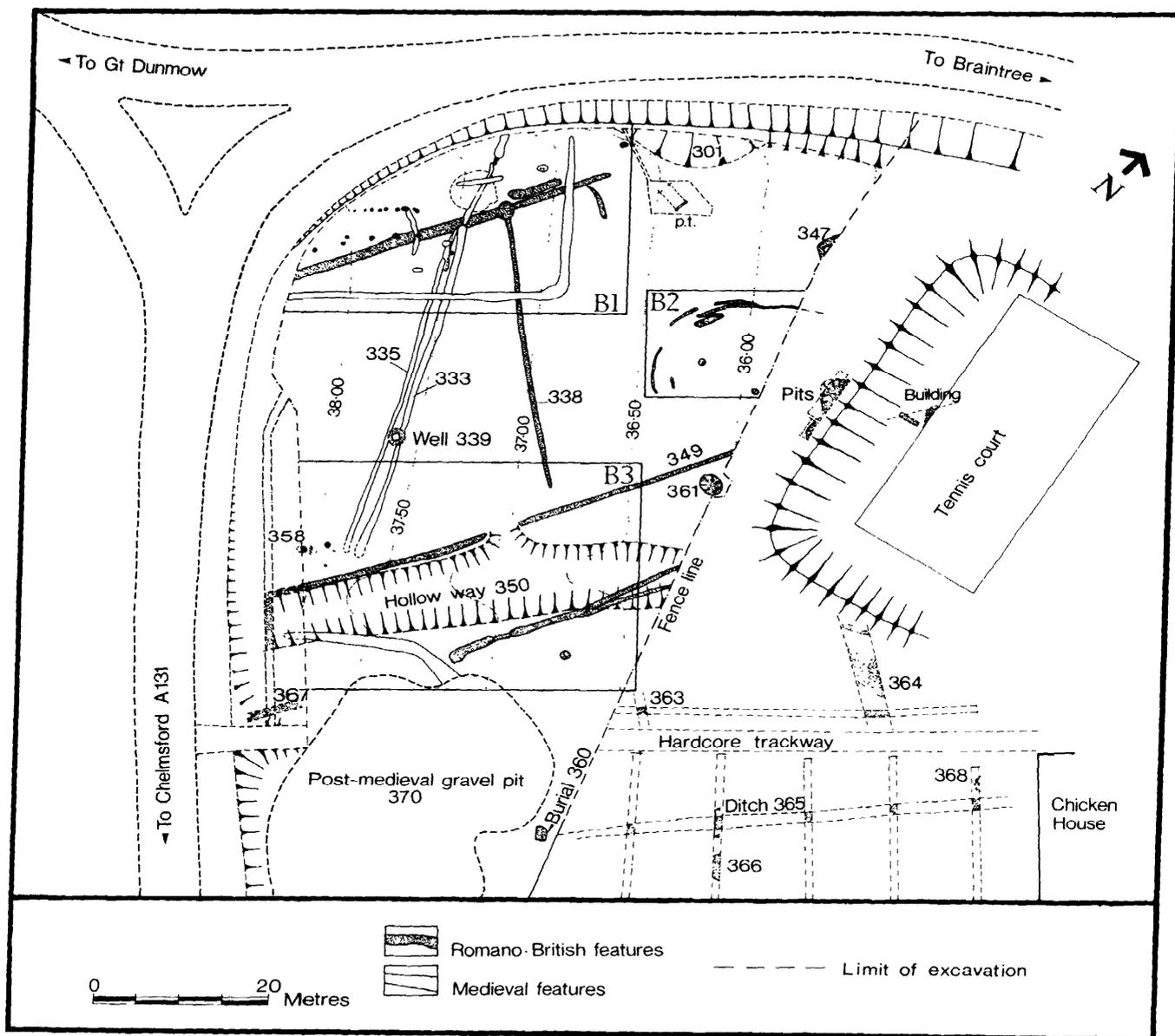


Fig 26 Little Waltham: general plan of area B. Scale 1:750

tained perishable material. A small pile of cremated bone fragments in the north corner might conceivably have been enclosed in a cloth or leather bag. Part of a pig's skull had been placed over the vessels; mutton (evidenced by rib fragments of a sheep), a domestic fowl, and a newborn or foetal piglet were placed in the pit, presumably for the otherworld feast. Fragments of an ox-skull found in vessel E may fall into the same category, although some deeper significance may attach to this essentially inedible inclusion in view of the importance of the bull, particularly the head, in Celtic mythology (Ross 1967, 384-90). For a specialist report on these bones, see p 116 below. It is perhaps worth noting that the Welwyn-type burial at Snailwell, Cambs,

was also accompanied by pig, ox, and bird bones (Stead 1967, 50).

The contents of the pit had been covered by partially charred timber, probably planking. It is a matter of speculation whether the charring was deliberate or whether the timber was merely rescued from the pyre. The vessels eventually collapsed under the pressure of the earth filling the grave, light-brown clayey material infiltrating them. The group was almost undamaged by modern ploughing.

The pottery is described and discussed below (pp 85-6); a date within the decade *c* AD 50-60 seems inescapable, despite the absence of samian ware. For further discussion, see p 136.

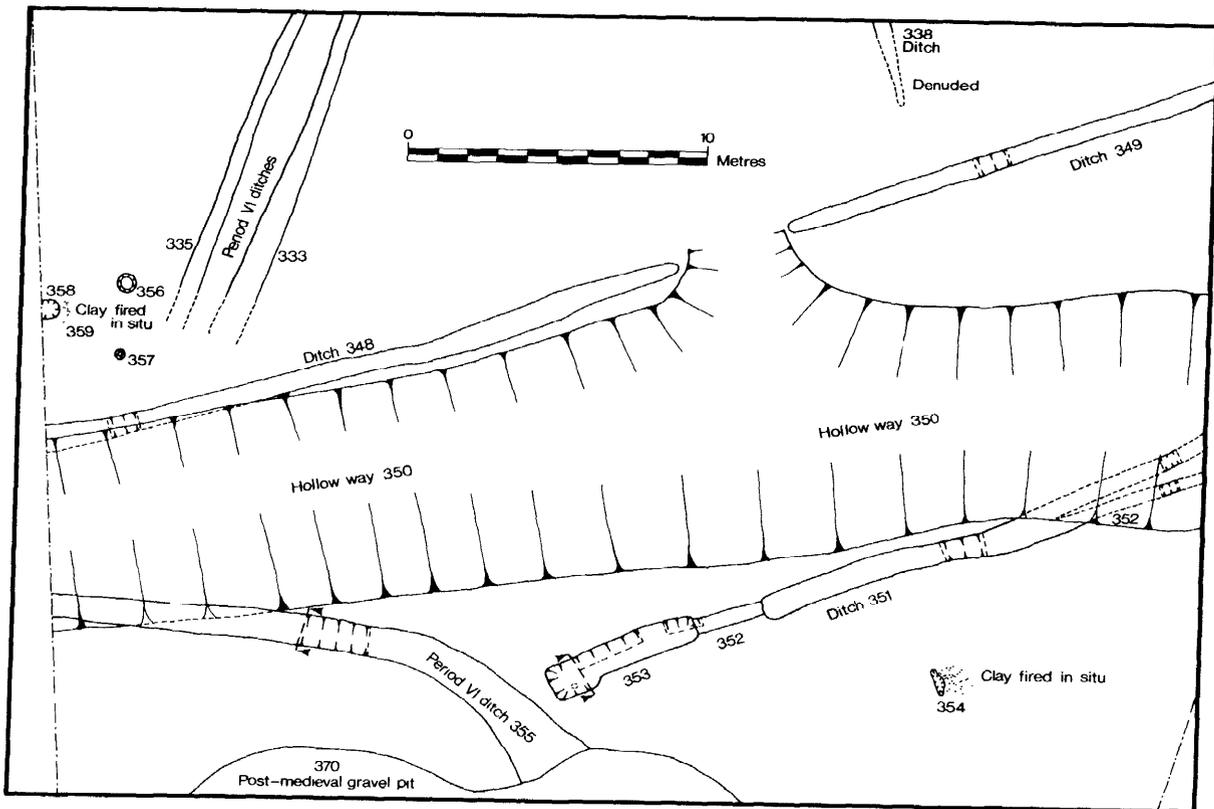


Fig 27 Little Waltham: area B3. Scale 1:250

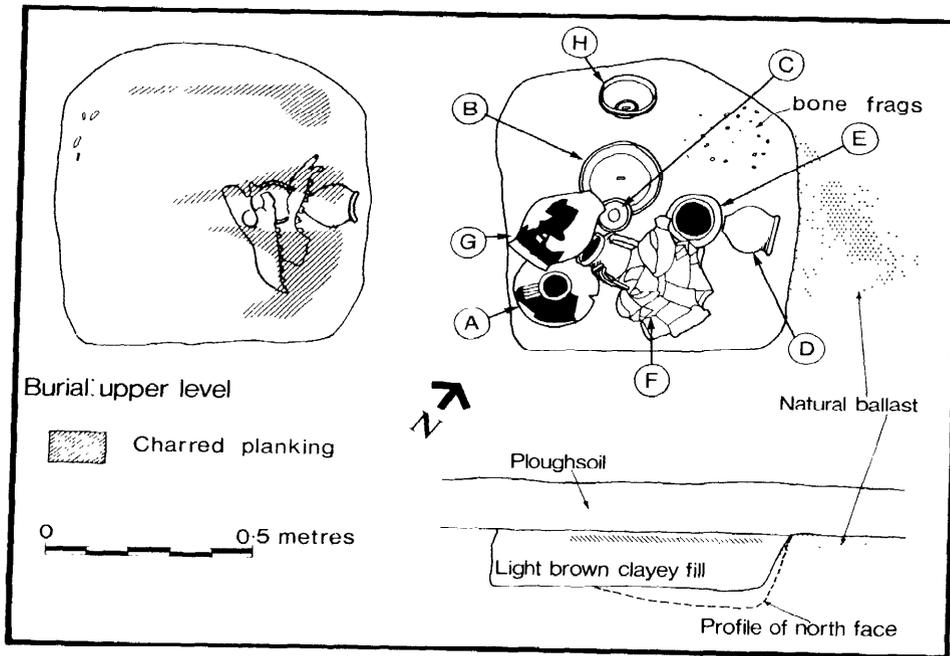


Fig 28 Little Waltham: details of the burial, F360

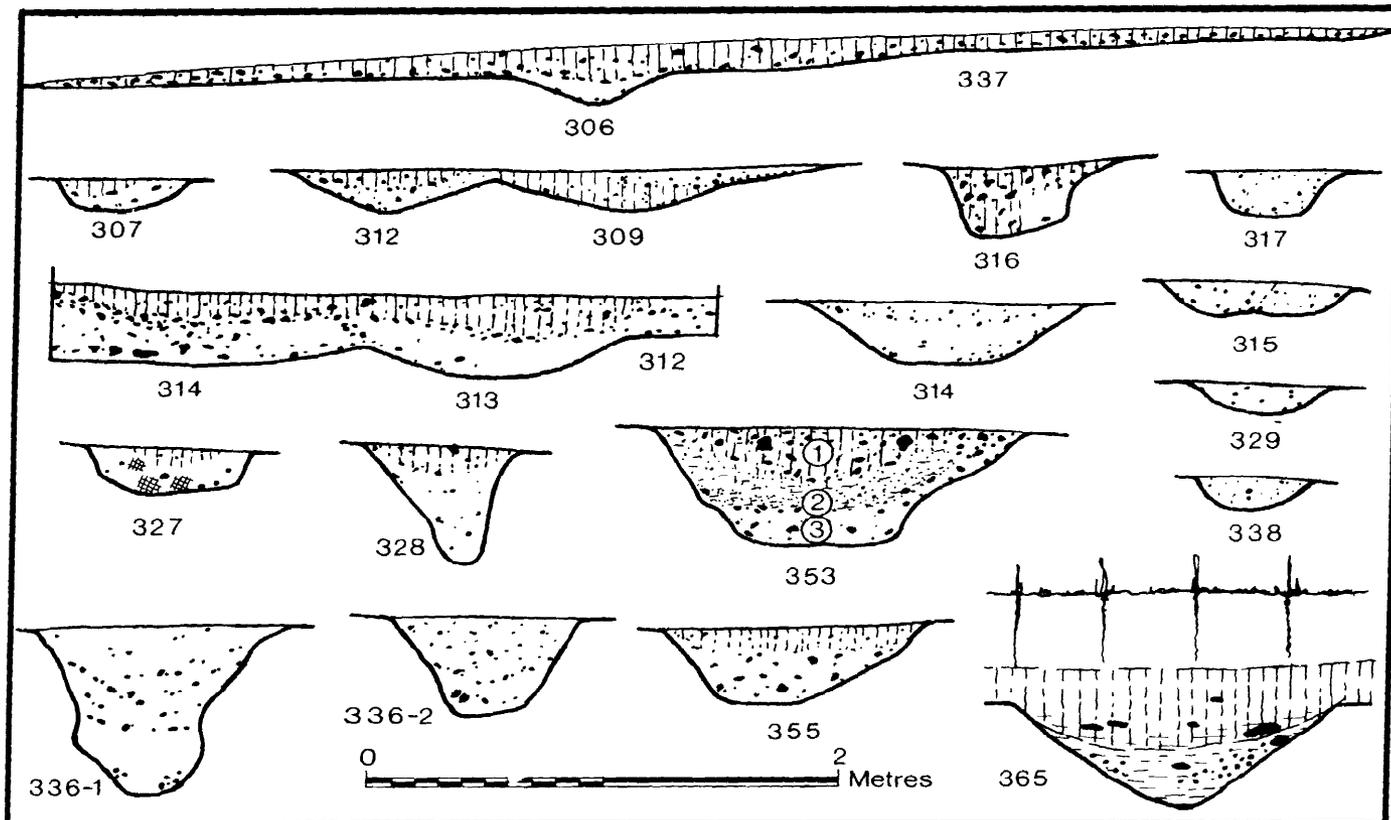


Fig 29 Little Waltham: sections 6; for key to sections, see p 16

Field boundaries (Figs 26, 27, 29, and 34)

In addition to the ditches delineating the road enclosure, ditches 338 and 312-4, forming two enclosures 40m deep and of unknown width, appear to belong to phase 1; the scatter of early *sigillata* in this area (below, p 93) tends to support this hypothesis and the precision of their layout is clear. Ditches 312 and 338 were about 0.20m deep, whilst 314 had been increased, probably as a result of recutting, to about 0.35m deep; in some sections of the latter two distinctive cuts were visible, their lines having diverged slightly. The earlier cut had a U-shaped profile, the later a much sharper one; both were filled with a greenish-grey silty clay. A substantial hollow, 313, had formed at their junction, presumably as a result of water action. Feature 309 may block an entrance in an earlier phase of 312, the eastern section of which had been obliterated by modern ploughing. Feature 311 presumably relates to the ditch 312; at 0.10m deep it had mostly been destroyed by ploughing.

To the south of the road, ditch 365 appears to be an addition to this pattern; it contained material of 2nd-3rd century date. Plough damage had totally obliterated its western extremity, though it may have passed over the burial 360. Ditch 363 probably represents the last traces of a link between 351 and 365, and 364, another whose apparent great width in plan was probably due to recutting; these are aligned neither to the phase 1 road nor 365. Ditch 364 was observed in trial trenches and during the construc-

tion of a service road, but was unfortunately not sectioned; surface finds included a barbarous radiate coin.

Most of these boundary ditches appear to have gone out of use at the end of phase 2, though the presence of a few sherds of late shell-tempered ware in feature 314 seems to indicate the continuance of some through the 4th century (for a discussion of the date of this material in Essex, see Drury *et al* 1976, pp 45-6). Ditch 314 also contained smelting slag (below, p 115).

In area A, ditch 259 contained only a few sherds of Roman pottery, including several of a samian platter of Claudio-Neronian date. The sections suggest that the feature might have been a palisade fence rather than a ditch; whether it is pre-Roman in origin, going out of use early in the Roman period, or simply a feature with a short life (there being no obvious signs of recutting or reconstruction) is not clear. Ditch 252 seems to be related in its alignment to both 259 and the modern boundary 254, with which it probably merges west of the excavated area. It was clearly in use during much of the Roman period, although the few sherds of pottery recovered do not allow close dating. An attempt to relate these boundaries to a wider context appears below (pp 134-5).

Fenced enclosure (Fig 30)

The last vestiges of slots probably defining two sides of an enclosure were found in the eastern part of the excavated area. The subsoil was brickearth with gravel patches; the

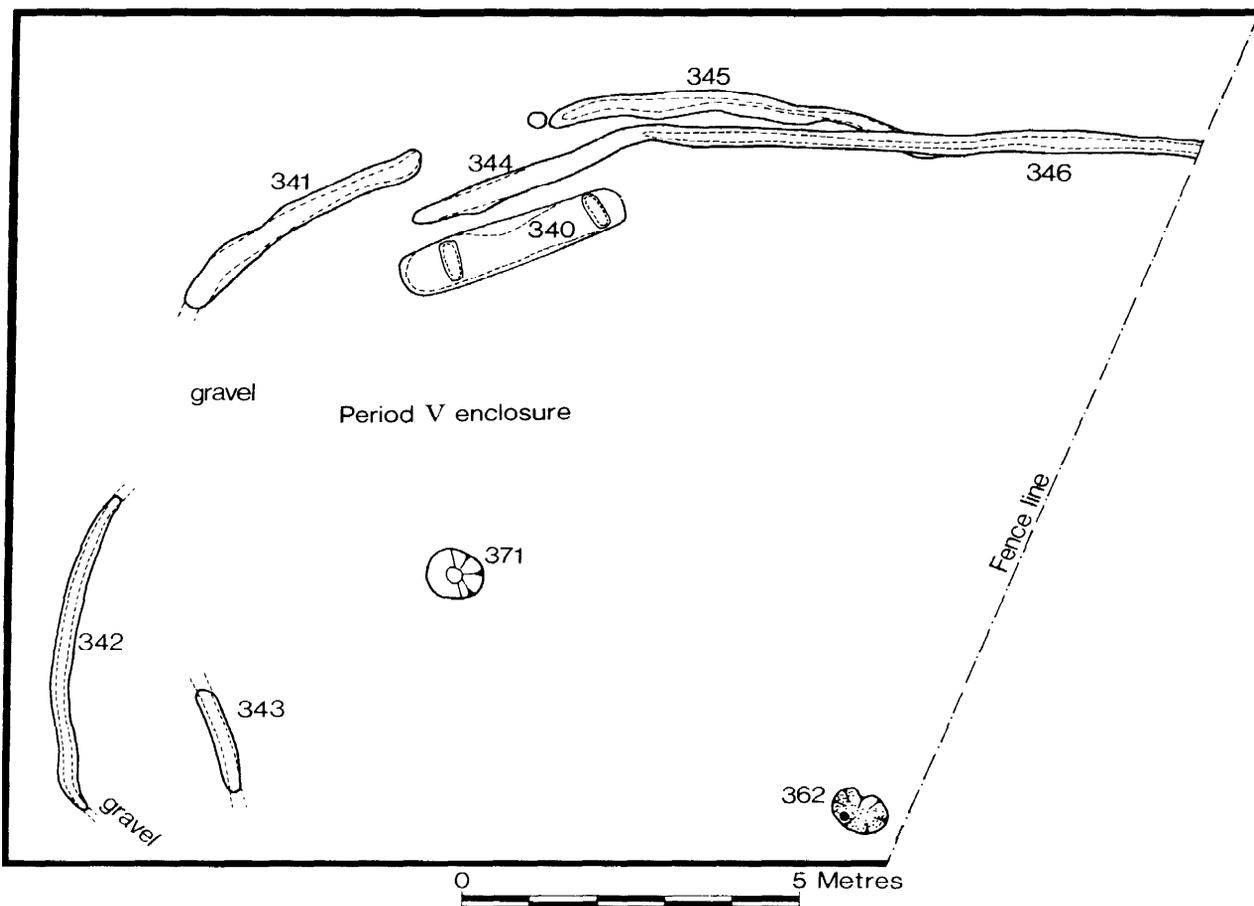


Fig 30 Little Waltham: area B2

slots were traceable only in the brickearth, which they had penetrated more deeply. The original construction presumably comprised features 345, 341, and possibly 343. Feature 344, stratigraphically later than 345, together with 342 which appeared to continue its line, presumably belong to a rebuild. The slots survived up to 0.10m deep, with a filling of dark brown loamy clay, that of 345 being flecked with charcoal.

The gap between features 341 and 345 appeared to be, by the sharp ends of the slots, a true feature of the original construction. This appearance was emphasized by the setting for an individual post west of the end of 345, leaving a clear gap of 1.35 m. Approximately 1.10m inside this entrance was a relatively wide slot, 340, c 0.10m deep, within which were two sinkings a further 0.10m deep. It seems possible that 340 acted as a baffle, forming in effect two restricted entrances to the enclosure each about 1.00m wide; this is to some extent supported by the fact that the deeper sinkings line up with the ends of slots 341 and 345. The reason for the width of the slot 340 is obscure; if the hypothesis is correct perhaps a form of turf and timber construction was used.

Within the enclosure, and possibly associated with it, was posthole 371, 0.90m in diameter and 0.30m deep, with a filling similar to that of the slots. A continuation of 366 was clearly found by Chapman in 1963, but in the absence of a proper plan it is impossible to correlate her

findings further (Bazett & Chapman 1966,50-1). A length of slot not continuous with, and at right angles to, the main line, found in 1963, may indicate that the third side of the enclosure lay between the limit of excavation in 1972 and the tennis court bank.

Feature 340 produced a sestertius probably of Antoninus Pius, and the posthole 371 another of Hadrian, both much worn. More useful as an indication of date was a coin of Claudius II, c AD 270, from feature 345, apparently part of the original construction. The enclosure therefore seems to belong late in phase 2: the maximum life span of each of the two builds may have been in the order of 30 years.

The features in the area of the enclosure are probably of 2nd century date. Feature 362 was a pit or posthole c 0.30m deep, filled with a fine grey silty loam which contained much burnt clay (not burnt *in situ*) and a number of flint and tile fragments. Feature 347 was a gully some 0.25m deep, with a filling of brown loamy clay flecked with charcoal: it turned through a right angle within the excavated area. Too little was recovered of its plan to suggest its function.

The well, F339 (Fig 31)

Within the western of the two enclosures north of the road was a well, 339, whose bottom lay 3.60m below the base of the ploughsoil. The timber lining, all of oak as far as one

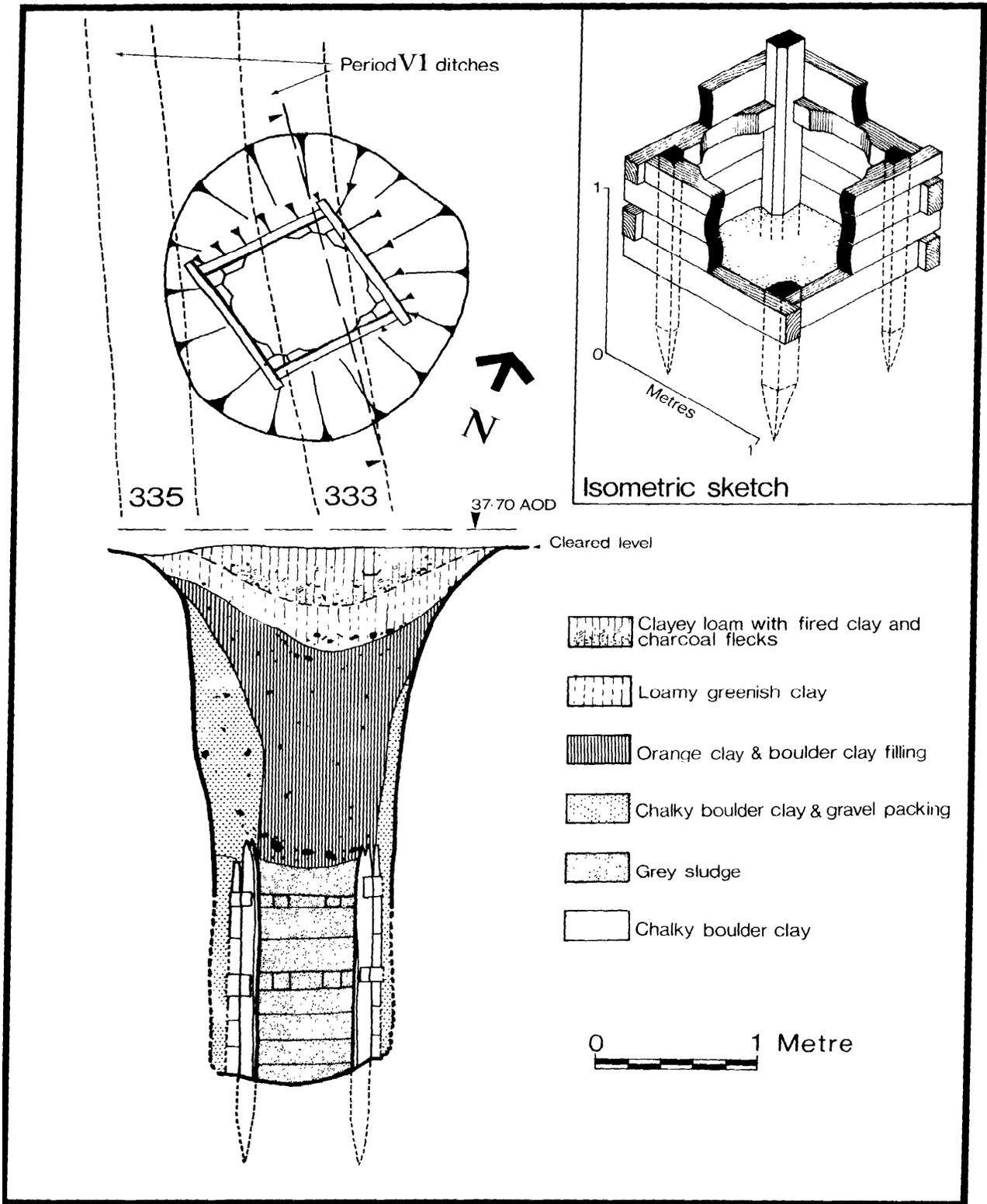


Fig 31 Little Waltham: details of the well, F339

could see, had been preserved to a height of 1.50m by the anaerobic conditions prevailing in the sludge, whose surface was found at the same level.

The framing consisted of four posts, one diagonal pair *c* 0.10m x 0.09m, the other pair *c* 0.10m x 0.13m, driven into the clay beyond the well bottom. The lower parts of the posts were not exposed, but probing suggested a penetration of *c* 0.60m and the sharpening of the post ends. The posts were kept apart at higher levels by horizontal timbers *c* 0.08m x 0.12m housed around the posts at the corners, ground pressure keeping all members in close contact. Between the spacing members, boards 0.05m thick and 0.15-0.20m wide formed the lining, again being kept in position by ground pressure. There was no evidence of the use of wood or metal fixings in the construction. The spacing members were cut back flush with the internal faces of the boards in the centre of each side, perhaps so that they would not form an obstruction to buckets or jars pulled up the sides. If this was the case an elaborate well head was unlikely; a certain amount of structural timber within the well, though probably derived from upper parts of the structure, shed no useful light on its form. The well was 0.80m square internally.

This is an unusual form of well-framing; most examples excavated in the area consist either of shoulder-jointed planks, with or without internal posts at the angles (eg Hawkes & Hull 1947, 127, wells II-IV), or of caissons formed of oak planks dovetailed at the corners (eg *Britannia* 1 (1970), 291, from Wickford). Curiously, however, the Waltham well is of the same form as those found at Wijster, Holland, the only significant difference being that, at the latter, the planks do not generally project externally at the corners, although in one case (Wijster Well 7) each plank projects at one corner (Van Es 1967, ch 6).

The lower part of the well was filled with grey sludge which provided valuable information about the local environment (see below, pages 136 and 143). Artefacts of well-preserved wood and leather were recovered, in addition to iron objects and a range of domestic pottery. The pottery included fragments of a number of narrow-necked jars, probably used for drawing water by means of a cord tied under the rim; buckets were also used for this purpose, as the fragments recovered showed. Presumably at the end of its useful life a quantity of rubbish, including an appreciable collection of animal bone and the body of a dog (report, p 117), was thrown in. The upper parts were then infilled with orange clay and chalky boulder clay, containing many flints, capped with loamy greenish clay. This filling also contained a quantity of animal bone, including the complete skeleton of a fox with a healed fracture of the leg (below, p 117)—just possibly a pet? The fracture could, however, have set without assistance, in the wild state. Later there was subsidence, causing a hollow which became filled with dark brown clayey loam flecked with fired clay and charcoal. Lumps of iron slag were present throughout the whole of the well filling.

The destruction of the well can be dated to the close of the 3rd century by the pottery group contained in its filling, together with two barbarous radiates and a coin of Gallienus from the upper levels. This is in line with the terminal dates of the other phase 2 features. The date of its construction is, however, unknown, nothing being found in the material, probably the packing, behind the upper timbers to give a convincing indication. There was no evidence of renewal of timbers at low level. A guess of perhaps a century for its life span may be reasonable.

Possible ironworking features (Figs 26, 27)

Smithing slag and charcoal were found in some quantity

in feature 353 and the upper filling of the well 339; slag was also found in the lower filling of the well, ditch 314, and residual in Period VI features. The slag is described below (p 115).

To the north of the road ditch 349, in an area badly denuded by ploughing, a patch of clay fired *in situ*, 359, was found with two postholes, 356 and 357, respectively 0.70m and 0.30m in diameter and 0.20m and 0.10m deep, and a small slot, 358, 0.70m wide by more than 0.70m long, 0.10m deep, adjacent. Posthole 356 was filled with loamy clay with charcoal and fired clay flecks, capped with clean orange clay; features 357 and 358 were filled with grey-brown sandy loam.

To the south of the road a more substantial area of clay, about 1.00m in diameter, had been fired *in situ* although the original surface did not survive. It was bounded on the west by a hollow 0.10m deep filled with charcoal and clay. The group lies some 8m east of ditch 353.

Though definite proof is lacking, it is possible that these two groups of features were connected with ironworking, the fired clay areas perhaps representing the remains of hearth bases and the postholes some form of sheltering structure. If so, then the occurrence of slag in the well-filling indicates that these features probably belong to phase 2, going out of use at the close of the 3rd century; they can hardly have had a long active life. Virtually no intrinsic dating evidence was found. A hearth found by Bazett and Chapman (1966, 50) in the area of the fenced enclosure, and traces of firing adjoining feature 366, may also be connected with this activity.

Buildings and ancillary features in the tennis court area

The principal results of the excavation undertaken by Mrs R M Bazett, following finds made during the construction of a tennis court at 'The Limes' in 1962, have been plotted on the plan (Fig 26) with the aid of Mrs Bazett's original field drawings.

Two areas alongside the tennis court indicated the presence of the gravel-metalled floor of a timber building, possibly destroyed by fire. Above the metalling, which was contemporary with a posthole 0.20m in diameter and 0.80m from its northern edge, lay 0.05m of grey clay, possibly an occupation level, and 0.08-0.30m of black soil containing 'a large amount of burnt daub, charcoal, brick fragments, and nails' as well as pottery and tiles. The alignment of the building was approximately that of the phase 1 road, though it lay to the south of the projected line of ditch 349, ie within the road enclosure.

Three contiguous trenches west of the tennis court produced two pits of irregular plan, the larger being about 1.00m deep, filled with black soil and domestic debris.

Four barbarous radiate coins were found in the destruction debris above the building; a further four from the pits, together with single coins of Tetricus I, Gallienus, and Salonina his wife give, with the evidence of the pottery, a clear enough indication of a cessation of intensive occupation towards the end of the 3rd century.⁵ It has been suggested by Dr Reece (below, p 94) that these coins, together with a further ten of similar date from other features, may represent the remains of a dispersed hoard.

A coin probably of Verus, 160-7, a few sherds of later 2nd century samian ware, and an enamelled brooch in the form of a hare, were the earliest datable items present and probably indicate the period of origin of the habitation site. The excavated building itself would probably have had, however, a life much shorter than the suggested 100-150

years duration of occupation. There is an absence from the material excavated in area B, 1971-2, of earlier 2nd century samian ware, which may add further support to the suggested dating. However, Dr Rodwell observes (p 94) that this absence is a general one in the area, and it may, therefore, have a cause quite unconnected with the sequence of occupation on the site.

The Romano-British topography (Fig 32)

A considerable number of Romano-British villas and farms are known in the Can and Chelmer Valleys, and doubtless many more remain to be found. The following sites are known in the immediate vicinity of Waltham (the numbers refer to Fig 32):

1 Oak piles thought to be part of a Roman bridge and/or causeway were found in 1949 in a sewer trench in The Street, Little Waltham, at a depth of *c* 1.8m. The late Major J G S Brinson was able to trace them for 100yds to the north-east of the present line of the river and 40yds to the south-west. The first section discovered was said by the foreman to have been 'metalled with layers of rammed chalk and clay over the piles' (Brinson ms). A section of a pile is preserved in Chelmsford Museum (B 18277; 0.24m square); the average size was *c* 0.27m square, some being up to 0.34m square. The smaller ones were on the firmer ground, the size increasing 'towards the actual river crossing, in the wetter marsh' (Brinson ms). No associated dating evidence was recovered, but slices of some of the timbers were sent to A W G Lowther, who dated them by dendrochronology to *c* AD 16.5. or in fact slightly later, since some outer rings were missing." Whilst this correlates with the date obtained for the beginning of phase 2 on the bypass site, no reliance can be placed on Lowther's results; indeed, the structure could well be post-Roman, especially in view of the fact that Brinson noted that the piles seemed to have been sawn rather than adzed to shape. A bridge at this point would suit the phase 2 road line, but would be about 30m south of the probable position of the phase 1 road bridge.

2 Roman buildings and pits located in 1962-3, described above, p 43.

3 During the construction of a swimming pool at 'The Limes', *c* 1959,¹⁷ a small quantity of abraded Roman and post-medieval pottery was found, not apparently associated with any features. The material included a few 2nd/3rd century coarse sherds and fragments of a colour-coated folded beaker. A large storage jar rim in a reddish-brown fabric heavily tempered with sand is probably 3rd century. Two fragments of early *sigillata* (p 94) are of note.

4 A report in the *Braintree and Bocking Advertiser and Bardfield Times*, 28 November 1860, describes the discovery, a few days earlier, of 'a number of funeral urns, probably Roman' by workmen digging 'behind Mr Soper's house' (Little Waltham Lodge). One vessel was '16 inches high and nine or ten over', half-filled with human bones, and set upright with a 'loose cover' over the mouth. A second vessel of similar size contained 'a small vase, about six inches high' in addition to burnt bone; 'very near' was another small vessel 'about six inches high'. Later discoveries comprised two urns 'of the larger size' containing bones, 'a flat saucer-shaped circular dish, about six inches over, and one somewhat similar in shape but about half the size'; also much 'broken earthenware'. It is thus clear that a small cremation cemetery was found, in which four moderately

well-furnished burials were excavated, and several others disturbed.

Chancellor noted the site in a lecture to the Essex Field Club in 1881,¹⁸ giving the date of the discovery as 1864 and placing the find-spot to the south-west of the house. It seems likely, however, that the discovery of 1860 is the one referred to. The site lies immediately to the south of the Phase I line of the Waltham-Braintree road. The vessels cannot now be traced.

5 In 1959 a trench about 1m wide by some 22m long was dug by local residents in the field west of Waltham Lodge; the approximate position is indicated on the plan by a dotted line (*VCH Essex* 3, 196-7). The subsoil is very varied in this area, and it is difficult to decide from the drawn section¹⁹ which layers of gravel and clay were natural. On balance it seems probable that the material published as 'possibly part of a Roman road' was natural, the trench lying to the south of the probable line of such a road. A layer of pebbly black loam with fired clay flecks, a beam slot or posthole *c* 0.25m deep containing charcoal, and a considerable quantity of Romano-British pottery and other material principally from the southern part of the trench, indicate the presence of Roman timber structures at this point. The material included a coin of Severus (205-240) and two of Constantius II (34 1-46), together with about 50 sherds of coarse pottery spanning the 1st-4th centuries. Later material predominated and included part of a Nene Valley flagon, with chocolate brown slip on a white fabric; the vessel had been repaired with lead rivets in antiquity. A few sherds of Belgic material were also present.

6 A scatter of pottery (including samian ware of late 1st-early 2nd century date) and building material was found in the northern part of the field south of Little Waltham Lodge, *c* TL 706 123.²⁰ The late Major J G S Brinson found Roman tiles along the field boundary to the west in 1947.

7 In August 1929 Roman material was found 'by Stewart, the builder, when erecting one of those horrible little bungalows which are disgracing our countryside' (no 2 Roman Road, Little Waltham). So wrote Wykeham Chancellor to Chelmsford Museum on 6 January 1933, in a letter accompanying the material which he had secured for the Museum. The accession register notes 14 (undescribed) items, of which 9 are still extant. They comprise 2nd century pottery, an iron lamp and hanger, and a bronze casket handle; these are described below. The objects clearly came from a cemetery.

In 1948 the Roman Essex Society, under the late Major J G S Brinson,²¹ excavated in the rear garden of the bungalow. The position of the excavation is only known approximately, and is shown in Fig 3; details of the site are shown in Fig 33. The work revealed eleven cremation burials and one probable inhumation; they formed two groups, and most were damaged by ploughing. Fourteen reconstructed vessels from eight burials were subsequently deposited in Chelmsford Museum; unfortunately, neither their provenance within the excavation nor their associations were noted in the accession register, and although most have been identified with the aid of other available records, there is uncertainty about the associations of the flagons 392 and 393. Of the remaining pottery, predominantly from severely plough-damaged burials, only a few Romano-British sherds and three EPRIA or earlier flint-gritted sherds (two found close to group 3) are now extant; two worked flints were stated to have been found with one burial.

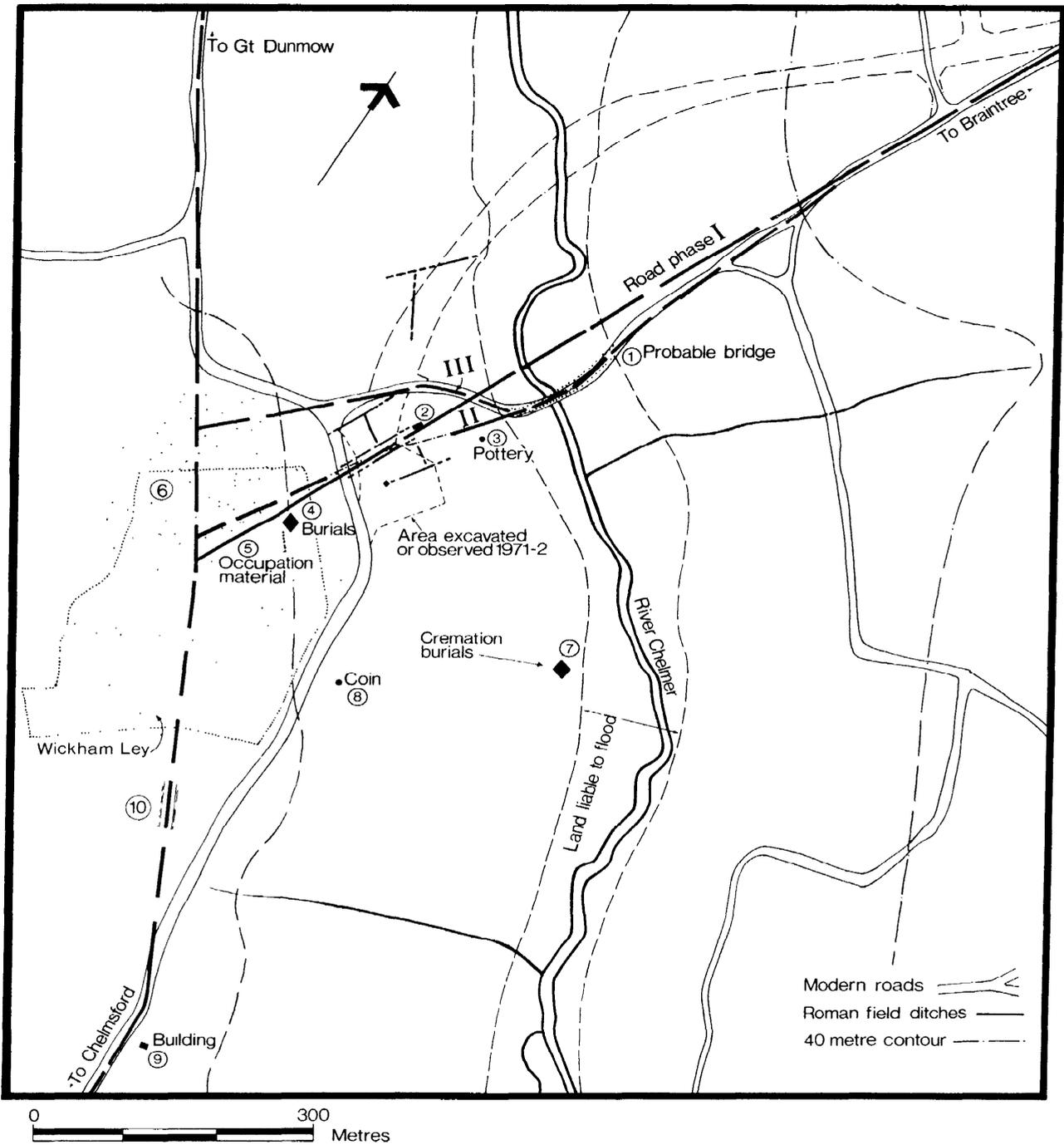


Fig 32 Little Waltham: the Romano-British topography

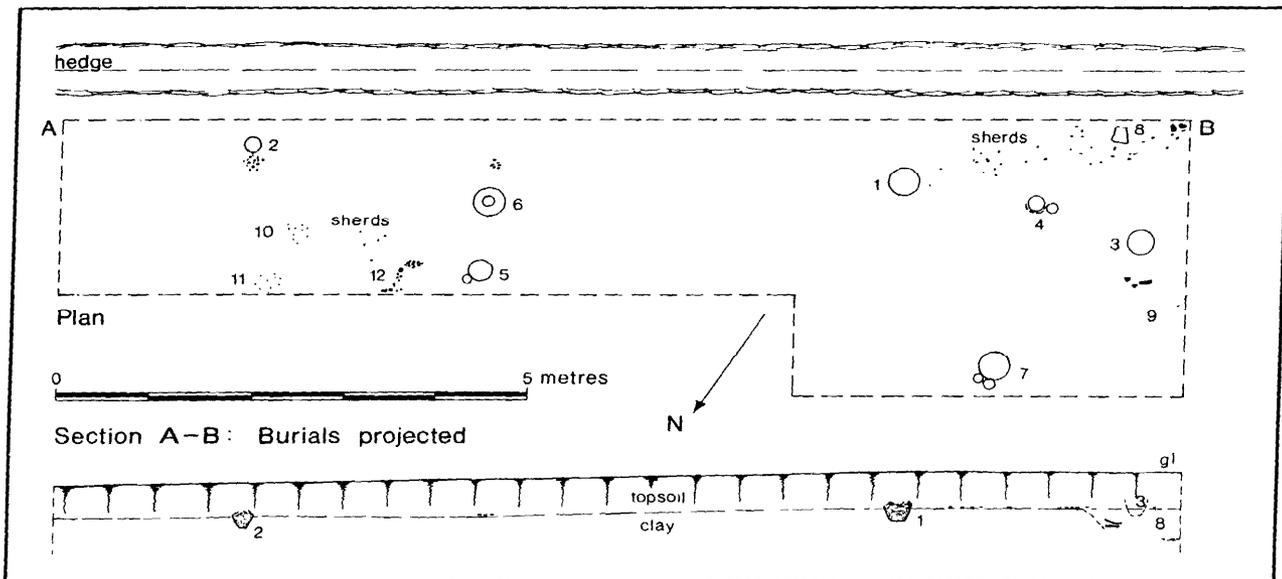


Fig 33 Little Waltham: Roman Road cemetery, 1948

The burials were as follows:

- 1 Narrow-necked jar no 397, the rim of which was presumably destroyed by ploughing. The site plan and section note a samian sherd on the top of the crushed jar. A few 'red sherds', no longer extant and also lying above the jar, may have been the remains of an accessory vessel. Probably 2nd century.
- 2 Jar no 390, with a scatter of sherds (including three of a small bead-rim jar) and cremated bone to the north, probably as a result of plough damage. Apparently 2nd century.
- 3 Narrow-necked jar no 396, badly damaged by ploughing, which had again caused a scatter of sherds and cremated bone to the north. Probably late 2nd-early 3rd century.
- 4 Jar no 391, presumably containing cremated bone, with a samian platter, Lud. Tg (p 94, no 4) covering its mouth and a small flagon (either no 392 or 393) alongside, Late 2nd or early 3rd century.
- 5 Two-handled flagon no 399 with the beaker no 398 alongside. Late 2nd or early 3rd century.
- 6 Large squat flagon, no 394, with the handles removed in antiquity, with a samian bowl, Drag. f 38 (p 94, no 5) used as its stopper. The flagon is unlikely to date before the mid 3rd century and was clearly old when buried. The group appears to be the latest of the cremations, the samian presumably being archaic at the time of interment.
- 7 Narrow-necked jar no 397A, lacking its upper part and containing the samian bowl of Drag. f 36 (p 94, no 3), with the poppyhead beaker no 395 and a small flagon, either no 392 or 393, alongside. The bowl is of late 1st century date, but the burial seems to belong to the first half of the 2nd century.
- 8 In the south-west corner of the excavation an ill-defined area of clay, apparently little different from the surrounding natural, seems to have contained

sherds to a depth of at least 1 m below ground level. The information on the original drawing is reproduced on Fig 33. The most substantial sherd found in the feature seems to have been no 400; much of the rim of a smaller jar is noted as having been found beneath it. There was a heavy scatter of sherds at the base of the ploughsoil to the east.

It seems likely that this feature was an inhumation grave of 3rd century date, whose filling consisted of the excavated clay and soil. The skeletal material would have been destroyed by the hostile soil conditions. Some at least of the large sherds in its filling and in the vicinity may be due to its having disturbed an earlier cremation burial.

- 9, 10, 11, and 12 These are noted on the site plan as concentrations of sherds at the base of the ploughsoil, and seem to represent cremation groups all but destroyed by agriculture. 12 was carefully plotted, the others (now stippled) were shown schematically. It was noted that 10, 11, and 12 included fragments of a total of 13 vessels.

On the evidence of burials 2, 4, and 6 the eastern group spans the period from the mid 2nd to the mid-late 3rd centuries. The western group begins in the early 2nd century, and seems to continue into the early 3rd century; if the interpretation of feature 8 is correct its usage was probably continued well into the 3rd century. The material encountered in building the bungalow dated from the 2nd century; it seems far enough away from the excavation to be considered as a third group. The significance of the groups is clearly not chronological; though certainty is impossible on the evidence available, it seems worthwhile to suggest that they were family groups.

More material was found by Stewart in 1951, when laying a sewer to the houses in Roman Road. The items still extant, in his possession in 1975, comprise:

- (i) A small flask in a light grey fabric with a black core and near black, rather weathered surfaces decorated with

burnished lines and rouletting. The top appears to have been broken off in ploughing, and the base seems to have been broken off in antiquity.

(ii) The base of a large jar in a soft brown sandy fabric with light grey surfaces, surviving to a height of a few centimetres.

(iii) A few fragments of cremated bone. The material is possibly the remains of a single cremation burial of early 3rd century date.

8 The Ordnance Survey 1:2500 plan records the discovery of a 'Roman Coin' at TL 7070 1232. A draft of the gazetteer prepared by MR Hull for *VCH Essex 3*, formerly in the possession of the late Major J G S Brinson,²² supplies the following details: 'A coin of Ptolemy VI (18 1-46 BC) from the mint of Paphos, Cyprus, was found in 1949 at a depth of 4 ft below the surface, in cleaning out a roadside ditch behind the garage'. The coin was shown to Brinson, but its present whereabouts are unknown. The road ditch was that of Chelmsford Avenue, then unmetalled. For discussion, see below (p 134).

9 Following the discovery of a small Romano-British flagon by the landowner during shrub planting, boys from King Edward VI Grammar School, Chelmsford, dug in the field to the south of the house now known as 'High Hedges', immediately east of the Chelmsford road, in 1956.²³ The principal results of a limited excavation were part of a timber-framed building with a gravel floor, the timbers being set on strips of clay c 0.40m wide above a general spread of gravel. A ditch was probably later than the floor, cutting through it. The finds have unfortunately been lost, but the building appears to have been of 2nd century date, on the evidence of pottery described at the time; the ditch was probably 4th century. The site may well be extensive.

10 In 1971 a slight agger was observed (by the writer) in the arable field south of the park surrounding Little Waltham Lodge. A much-abraded sherd of a roll rim storage jar was found on the surface. The feature presumably indicates the line of the Chelmsford-Great Dunmow road; its absence from the park may be due to landscaping.

11 (See Fig 74). In 1972 a fragmentary upper stone of a quern of Hertfordshire Conglomerate (Puddingstone) was found in draining a field on Pratt's Farm (TL 720 119). The stone, now in Chelmsford Museum (Accn no B 18278) was 0.35 m in diameter and 0.13 m high, with a tapered hole a minimum of 0.07m in diameter.²⁴

12 (Not on plan). In 1901 some 180 coins were found in a gravel pit on Sheepcotes Farm (TL 7172 1340). The hoard included coins of Postumus, Victorinus, Tetricus, and Claudius Gothicus; it is now in the possession of Mr J J Tufnell, of Langleys, Great Waltham, the descendant of the landowner at the time. In June 1972, eight coins were brought into Chelmsford Museum for identification²⁵ by the descendant of the tenant of Sheepcotes, Louis Campen, at the time of the discovery of the hoard. These consisted of a base silver coin of Postumus, four bronze coins of Tetricus I, one of Victorinus and two barbarous coins, one showing the use of a reverse stamp on both sides. It seems likely that these were part of the 1901 hoard, whose completeness is therefore doubtful.²⁶

Unlocated: Richard Gough recorded, about 1760, finds of bronze, iron, and glass objects, and stated that a blacksmith in the village had a piece of mosaic pavement (Bodl ms Top Gen e 18, noted in the Brinson copy of the *VCH Essex 3* manuscript: (see n 22, p 138).

Period VI: Early medieval

Occupation in area B during the 12th century was represented by two successive groups of features:

- 1 Boundary ditches on a north-south alignment in area B.
- 2 A timber-framed building within a palisaded enclosure.

There was no evidence of Saxon occupation. Saxo-Norman material has, however, been found east of the river, perhaps indicating a settlement in the area of the present church and hall, east of the modern village.²⁷

The excavated features

Period VI features were generally filled with a greenish clay derived from the natural clay; gravel content varied according to local subsoil conditions. Postholes were packed with excavated material; no deliberate use of large stone or gravel was noted. Dimensions are summarized in Table 9.

Phase 1: 333, 335, 334, 306, 305, 304, 303, and 332 (Figs 27, 29, 31, 34)

Phase 1 was represented by two very shallow ditches, 333 and 335 (Figs 27, 34), surviving below modern plough level to a maximum depth of 0.10m. Though they were clearly not contemporary, no evidence of sequence was obtained. The line is continued to the north by a shallow gully, 306. c 0.20-0.25 m deep, itself giving way to two shallow postholes, 305 and 304. Feature 303, clearly of two phases, was c 0.40m deep, with steep sides: it may represent a setting for a timber fence.

These features are probably to be interpreted as a field boundary of at least two principal phases, with a gap eventually closed by feature 306. The relatively small quantity of associated pottery, principally from 306, was visually similar to that from the phase 2 features.

Phase 2: 336, 307, 308, 331, 330, 315-329 (Figs 29, 34)
The enclosure

A palisade trench, feature 336, formed the south and east sides of an enclosure in the angle of the main road. Earlier road improvements had removed probably half of the original area of the enclosure, whose size can be estimated at approximately 40m x 25 m, an area of 0.10 ha. The entrance presumably faced one of the road frontages, since it was not found within the excavated area.

The trench, which was not fully excavated, survived generally to a depth of 0.40m below cleared level. The south-east corner was strengthened by increasing the depth to which the posts were set to c 0.80m. Some individual impressions of posts in this area indicated the use of unsquared timber normally between 0.20m and 0.30m in diameter. One setting for a post in the south side, c 10m from the south-east corner, indicated a diameter of 0.55 m, though this clearly represented an isolated post rather than the norm. The extent of excavation was insufficient to determine whether such posts were provided at regular intervals.

The building

A structure of three bays, each c 2.85 m wide, with an average span of 3.50m, was located some 7m inside the southern boundary of the enclosure. Two postholes, 323 and 324, to the south-west may indicate a further structure, or even the principal structure, the majority of which had been destroyed by earlier road widening.

The south wall was defined solely by the principal posts,

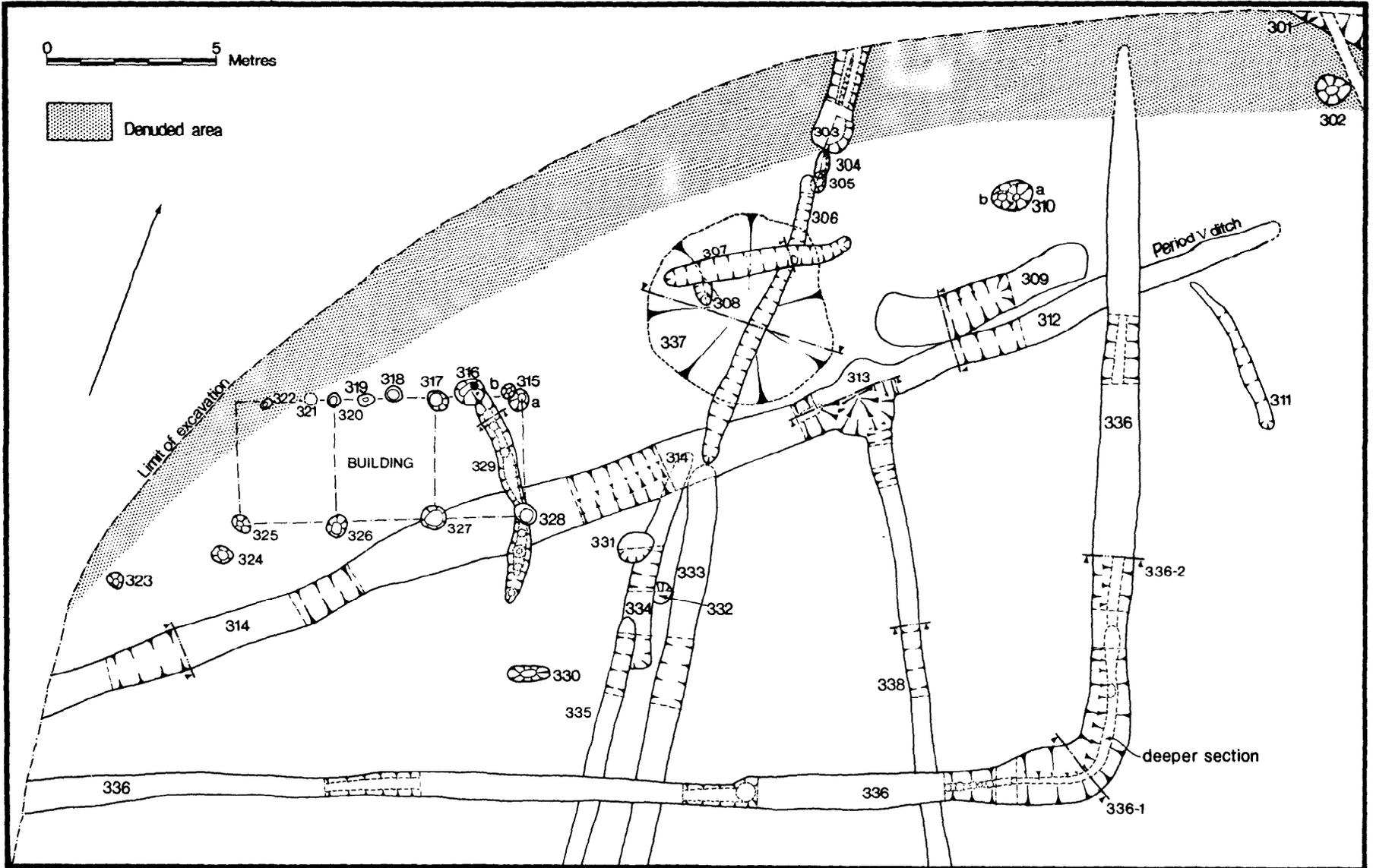


Fig 34 Little Waltham: Area B1

at least one of which (306) was squared, whilst in the north wall two intermediate posts were generally evidenced between the principals, themselves less substantial than those on the south. No trace of the gable walls could be detected; these were presumably not load-bearing. The western section of the building, and the area to the south-west, had been badly denuded by ploughing and the effects of hedge-clearance.

The use of principal posts and some squared timber suggests a 'primitive-framed' structure (following Beresford 1975, 36). Since the main posts, especially 325-7, are misaligned, reversed assembly was probably used, the wall-plate being placed above the tie-beams. Wattle and daub was doubtless used to fill the gaps between the uprights, and the gable walls were probably formed in much the same way. The difference between the construction of the north and south walls seems to suggest that the latter wall was more or less open, the roof being carried on the posts set in 325-8; this would explain why these postholes were more substantial than their opposite numbers in the north wall. If this inference is correct, the building must presumably have been agricultural, the dwelling having been effectively destroyed. However, it is only slightly smaller in plan than houses 1 and 2 at Goltho, of 11th century or earlier date; these too had their timbers set into postholes, on a clay site, but a rather more primitive superstructure was implied (Beresford 1975, 21, and fig 14, p 32).

Subsequent to the initial construction, the eastern end appears to have been roughly rebuilt on a different line; F329, a trench 0.15-0.20m deep, seems to be the foundation for a new gable wall. Such a wall would appear, unlike its apparent predecessor, to have been intended to provide some support to the remainder of the structure. It was extended forward on the south by some 2 m, perhaps forming a porch. Postholes 316b. and 328 in its excavated form, 0.60m deep, clearly belong to the reconstruction. Impressions in the bottom of 329 indicate the use of unsquared timbers between 0.20m and 0.30m in diameter.

TABLE 9 Details of Period VI and VII postholes. area B

F no	Diameter (m)	Depth (m)	Post size (m)
302	0.90 av	0.40	0.25
304	irregular	0.20	—
305	0.50 av	0.15	—
310a	0.80	0.22	0.20
b	0.60	0.32	0.25
308	irregular	0.15	—
315a	0.60	0.18	0.23
b	0.40	0.18	0.12
316a	0.75	0.35	0.20 'ghost'
b	0.75	0.40	0.20
317	0.60	0.22	0.40
318	0.45 av	0.15	0.30 av
319	0.40 av	0.10	0.12 av
320	0.35	0.15	0.23
321	0.40	0.03	—
322	0.25 av	0.12	0.12
323	0.50	0.16	0.20
324	0.60 av	0.10	0.25 av
325	0.55 av	0.08	0.60
326	0.60	0.25	0.30 sq
327	0.70	0.25	0.3
328	0.65 av	0.60	0.40
330	irregular	0.20	?0.20
331	0.90 av	0.10	—
332	0.60	0.10	—

Other features

Several isolated shallow pits or postholes. ie 332, 331, 330, and 308, probably belong to this phase; 331 overlies a phase 1 feature. A shallow gully or slot, 307, 0.15 m deep and 5.50m long, is of unknown function: it may be struc-

tural. Pottery from its filling seems to belong to the early 13th century, and to be rather later than the probable date of the majority of the pottery from Period VI features.

Dating

The sole evidence of date is the pottery, considered in detail below (pp 92-3); it is generally assignable to the second half of the 12th century. It is clear from the similarity of the material from phases 1 and 2 that these were probably consecutive. The life of the phase 2 timber building might be estimated, in the absence of wholesale renewal of timbers, at a maximum of 20-30 years. Since the eastern wall was apparently reconstructed, at least partly to buttress the remainder, a period towards the top of this range may be reasonable, beginning perhaps *c* 1175.

Period VII: Late and post-medieval

Occupation proper within the excavated areas ceased with the abandonment of the Period VIcroft, subsequent features being either agricultural or related to nearby occupation. A group of features, 301, 302, 310, and 355 in area B, are dated by pottery probably to the 14th century. The pit 301 (Figs 26, 34), explored by machine-cut trenches, was dug from the medieval hollow way into the bank presumably to extract chalky boulder clay. This material was much used in the area at this period as a bedding for the cills of timber-framed buildings, being almost impervious. Postholes 302 and 310 (Fig 34) may be associated with the pit, whilst further south a ditch, 355, (Fig 27) with dark loam filling, probably formed part of an enclosure largely destroyed by later gravel working. A shallow hollow filled with loamy clay, feature 337 (Fig 34), contained material of 13th-14th century date.

In area A, the system of enclosures related to 'Foxtons' is clearly medieval in origin. Ditches 258 and 260 appear to have remained in use until *c* 1900, when they were back-filled over land drains. Ditch 258 is wider east of the junction with 269, having been much recut in that sector, whose origin may, therefore, pre-date that of the western part. Ditch 261 (Fig 9) may have been the forerunner of 260, discharging into the line of 258; on pottery evidence it went out of use in the 14th or 15th century. Features 241 and 243 (Fig 21) are short lengths of gully which initially drained into 261, though they silted and were cut by subsequent phases of it. The pottery from 243 resembled that from Period VI features in area A. The filling of this feature, of greenish clay similar to that of the Iron Age features, would be consistent with a Period VI date, which must presumably be applied to the origin of the system as a whole.

A formerly prominent hollow, 262 (Fig 3), running down the valley slope, south of area A and to the north of the former line of the A 131, was sectioned by machine. It was found to have been a watercourse, *c* 2.75 m deep. almost certainly of natural origin, which had silted up in the post-medieval period. A deposit of peat, a maximum of 0.5 m thick, containing animal bones, brick, and tile fragments, had accumulated in the bottom, above which was a deliberate filling of clay and gravel. A ditch *c* 1.50m deep had replaced it as a drainage channel, this itself being subsequently piped and filled, probably in the 19th century.

The southern part of area B was quarried for gravel in the post-medieval period, probably during the 17th or 18th century. The lower filling of the pit, feature 370 (Fig 26), contained much residual material; it consisted of grey silt, pebbly towards the bottom, possibly suggesting a period when the pit formed a pond. Traces of a building were

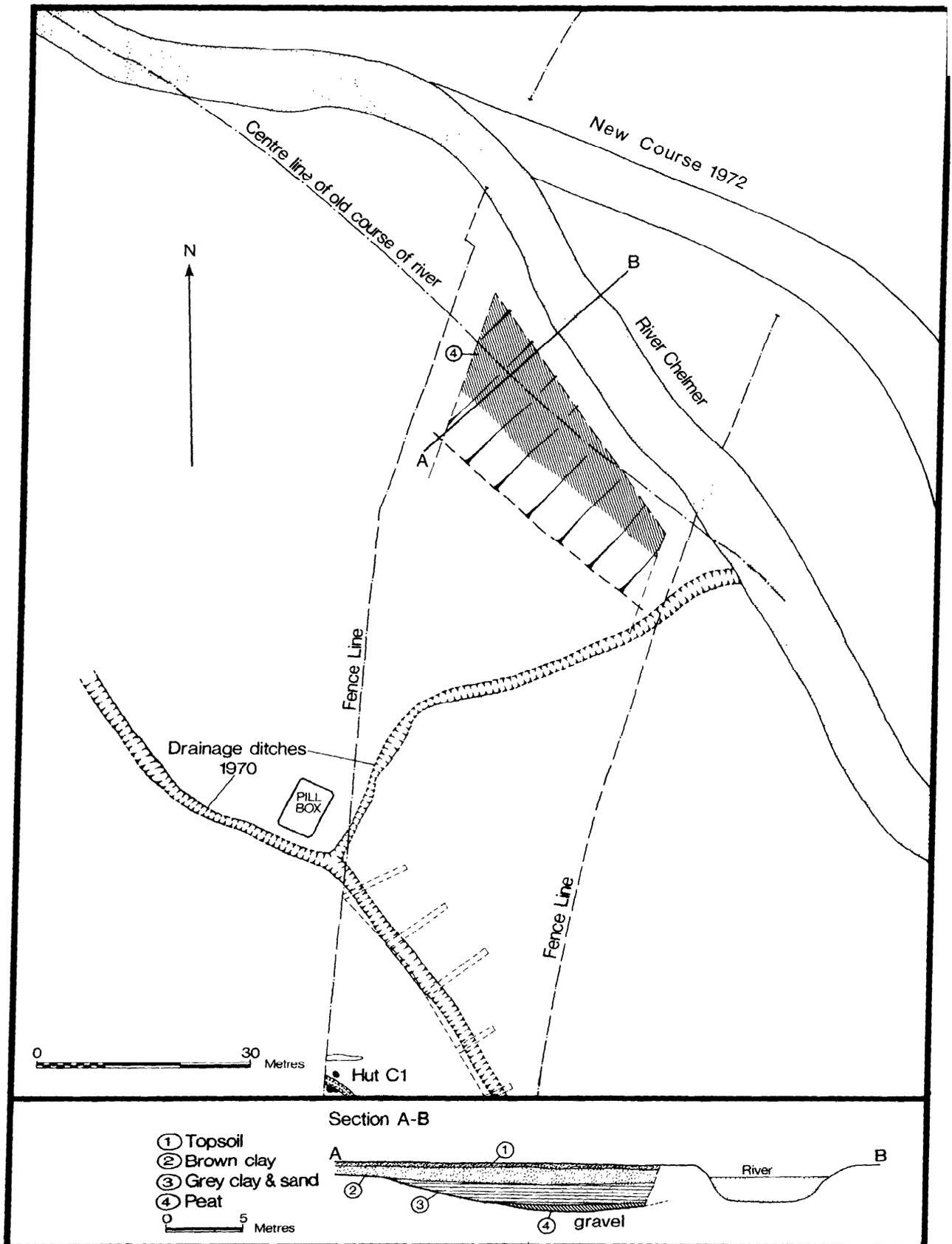


Fig 35 Little Waltham: the old course of the River Chelmer in relation to the Period III settlement

observed overlying this silt, which had clearly consolidated to a considerable extent. Mechanical extraction of the filling by the contractors prevented detailed examination of the building. It was clearly timber-framed, the cills being set on flint cobbles; the quantity of pegtile suggested a tiled roof. Its function was probably agricultural. The destruction debris was sealed by the upper loamy filling of the pit, which contained tile and brick fragments, gravel and, on the north side, burnt clay possibly from a large bonfire.

Subsequent activity in both areas was wholly agricultural until the period of the excavation.

The River Chelmer (Fig 35)

Trial boring in advance of road construction indicated the presence of a considerable depth of recent alluvium in the flood plain north of the Period III enclosure. This was excavated by the contractor to the ballast beneath, prior to the construction of the embanked bridge abutments; this work was observed intermittently. Immediately to the north of the Period III enclosure, the ballast was overlain by about 0.5m of brown alluvial clay, 2, and topsoil, 1; this increased in thickness to about 1.00m at A, beyond which it dipped into what was clearly a former river channel. The alluvial clay contained abraded Iron Age, Roman, and medieval postsherds in the area of the northern limit of the Period III settlement. It tailed off in thickness to the south, its southern limit being marked on Fig 8 as 'limit of flood plain erosion'. There was a definite impression of erosion having taken place where flood water in the heavily silted valley had scoured the lower part of the valley slope. There was a distinct drop of about 0.30m across the modern field ditch marking the recent limit of the flood plain; the difference in level was due largely to soil creep down the valley slope towards this boundary.

The channel was about 4m deep, and probably about 25m wide; although little deeper than the present channel it was of very different profile. The lower filling consisted of about 0.5m of peat and silt, 4, including log fragments and a few scraps of possibly squared timber, though no datable artefacts. Above this was a thick layer of grey alluvial clay and sand, 3, again sterile of artefacts, as was the upper brown clay, 2. A report on the pollen and other plant remains from layer 4 appears below (p 146). A sample of organic material from the same layer yielded a radiocarbon date of 3360 ± 80 bp (HAR-1047), ie 1410 bc. This suggests that the rapid silting began in the early Bronze Age; by the time of the Period II-IV settlements the process was doubtless largely complete. The wide shallow channel was, however, probably much the same in the Neolithic period (Period IB), when a settlement was established on its bank, above flood level. The absence of artefacts from the deposits in the channel further emphasizes the lack of settlement in the immediate vicinity between Periods IB and II (below, p 118).

V The excavated material

1 The pottery

Illustration conventions: a dashed line representing the rim in profiles and single sherds indicates that the angle is uncertain. A dashed centre line indicates that the diameter is uncertain.

Period IB: Early Neolithic

Fig 36 Feature 251

- 1 S-profiled vessel with flaring rim in coarse black fabric heavily tempered with crushed burnt flint. The surface, medium to light brown in colour, shows signs of a 'wiped finish' where it is not crazed by secondary firing.
- 2 S-profiled vessel with vertical rim in a similar fabric to no 1, with black surfaces, very smooth interior, burnt exterior.
- 3 Wide-mouthed bowl with internally thickened rim, in coarse black fabric tempered with crushed quartzite (presumably from an erratic) and some crushed burnt flint. Smooth black exterior surface; interior burnt, probably after breakage.
Not illustrated: Many body sherds in fabrics similar to 1 and 2, all burnt. No obvious fragments of flat bases were found.
- 4 Everted rim in coarse grey fabric heavily tempered with crushed burnt flint. Surfaces abraded, with red and brown patches. Three body sherds from this feature probably belong to the same vessel but do not join.

Feature 250

Closely comparable vessels have been found associated with the submerged land-surface near Clacton, on the coast of north-east Essex. Slack S-profiled vessels similar to Waltham Fig 36, 1, 2 were found stratified beneath a level containing later Neolithic pottery at Lion Point (Warren & Smith 1954, fig 2.2 and fig 1.8 respectively); the same area has yielded an internally thickened, slightly everted-rim bowl similar to Waltham, Fig 36.3, and another everted-rim bowl similar to Waltham, Fig 36.4 (Warren *et al* 1936, fig 2.4, 3 respectively). Further afield, Waltham Fig 36.1 finds a close parallel in P 165 at Broome Heath, Ditchingham, Norfolk, and Waltham Fig 36.2 in Broome Heath P168 (Wainwright 1972, 32). From the same site there is an internally thickened rim (P 267) as Waltham Fig 36.3 (*ibid*, 37), although P296 is closer in general form (*ibid*, 40); also everted-rim bowls as Waltham Fig 36.4, eg P226, 309 (*ibid*, 35, 41).

Periods II, III, and IV: Iron Age

Introduction and discussion

The excavation produced some 500kg of MPRIA pottery from features of Periods II, III, and IV. This was washed, dried, and marked in the field, decorated and obviously soft sherds being dealt with separately. Whilst this system led to surface damage to some sherds, it was the only practical method of dealing with such a large quantity of material. Attempts at dry cleaning individual sherds were not wholly successful, since the clay when dry was almost as hard as the pottery, and often harder than the (frequently eroded) surfaces. It is interesting to note that whilst most sherds could be safely washed by normal methods soon after excavation, some of those left to dry for a substantial period almost dissolved when an attempt was made to wash them. Considerable effort has been made to match joining sherds-an effort, it is hoped, reflected in the following section.

SIZE OF ILLUSTRATED FRAGMENTS

The problem of identifying residual sherds, rarely distinguishable by their appearance but almost certainly present in later features, is a difficult one. Size, together with a lack

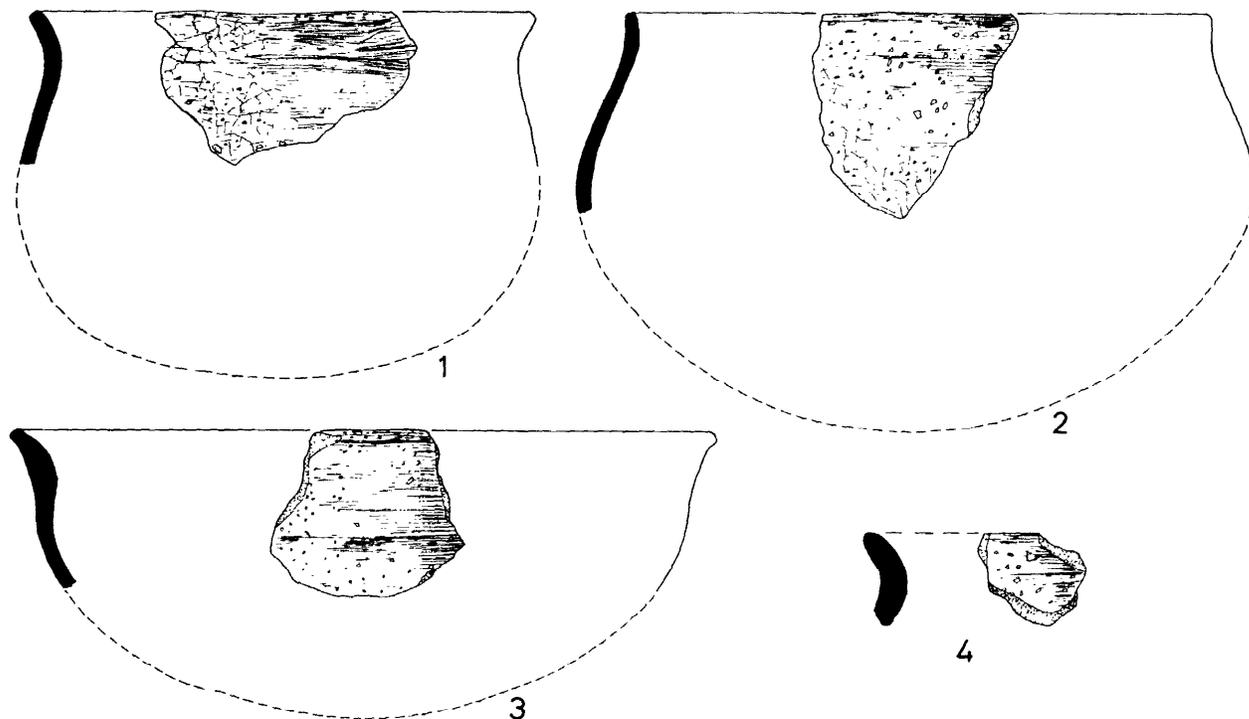


Fig 36 Little Waltham: Neolithic pottery (Period 1B) from F251 (1-3) and F250 (4), scale 1:3

of joining sherds, normally provides the best criterion, but in the case of some hut wall trenches, virtually all the pottery is in small, usually non-joining, fragments. This is probably due to the nature of the deposit, and perhaps should not be taken to imply that all or even most of the material is residual. An attempt is made here to present the material objectively; within each feature, sufficient sherds are normally illustrated to indicate the full range of forms present, and any other fragments which can be assigned to a particular form are listed. A letter A, B, C, D, or E at the end of each catalogue entry indicates the relative size of the fragment on which the illustration is based, as follows:

- A more than half the vessel
- B between one quarter and one half of the vessel
- C more than three sherds, less than half of the vessel
- D two or three sherds
- E a single sherd

Fractures in the course of excavation are disregarded in this classification, and substantial non-joining sherds of the same vessel are included in the totals.

FORMS

The vessels were divided into 18 groups by manual sorting of the drawings after illustration; of these 18 groups, 1-17, illustrated in Figs 37 and 38, accommodate virtually all the excavated vessels of Periods II, III, and IV; 18 is an omnibus classification for the early 'Belgic' vessels associated with Period IV. No distinction is drawn in the classification between vessels in non-local fabrics and those of similar form in local fabrics. In the catalogue entries, reference is not normally made to the form of the vessel

other than by the form numbers. Figure 39 illustrates the relative incidence of the various forms in each period of occupation.

This group of 333 vessels is the first substantial collection of MPRIA pottery to be published from the area. In view of the doubtful validity of drawing detailed parallels for this material from distant sites, close comparison has largely been limited to noting the incidence of a particular form at other sites in the region, notably Vinces Farm, *Ardleigh* (Erith & Holbert 1970), *Linford/Mucking*,²⁸ and *Chadwell St Mary* (Manning 1962). The wider significance of the stylistic traits represented is discussed below (pp 127-31)

Form 1

Jars with a clearly demarcated everted-rim above a well-defined shoulder; sometimes the definition amounts almost to a carination, eg 63, 137. The rim is occasionally decorated with finger tip or finger nail impressions, and may have an internal bead perhaps more as a result of manufacturing technique than intention, eg 21, 51. The vessels are not otherwise decorated and, with the principal exception of 208 in fabric J, are not normally burnished.

Typical examples: 59, 63, 84, 137, 166, 183, 208, 209, and 210.

This form accounted for almost 20% of the vessels from the Period II, group A huts, but its incidence declines steadily through Periods III and IV. This may reflect its probable origin in the sharply angular 'situlate' jars of the earlier Iron Age (eg *Linford*, Barton 1962, fig I.1) whose form is recalled particularly by no 63.

The form occurs at *Ardleigh*, fig 13.3, *Chadwell*, fig 4.1, and *Mucking*.

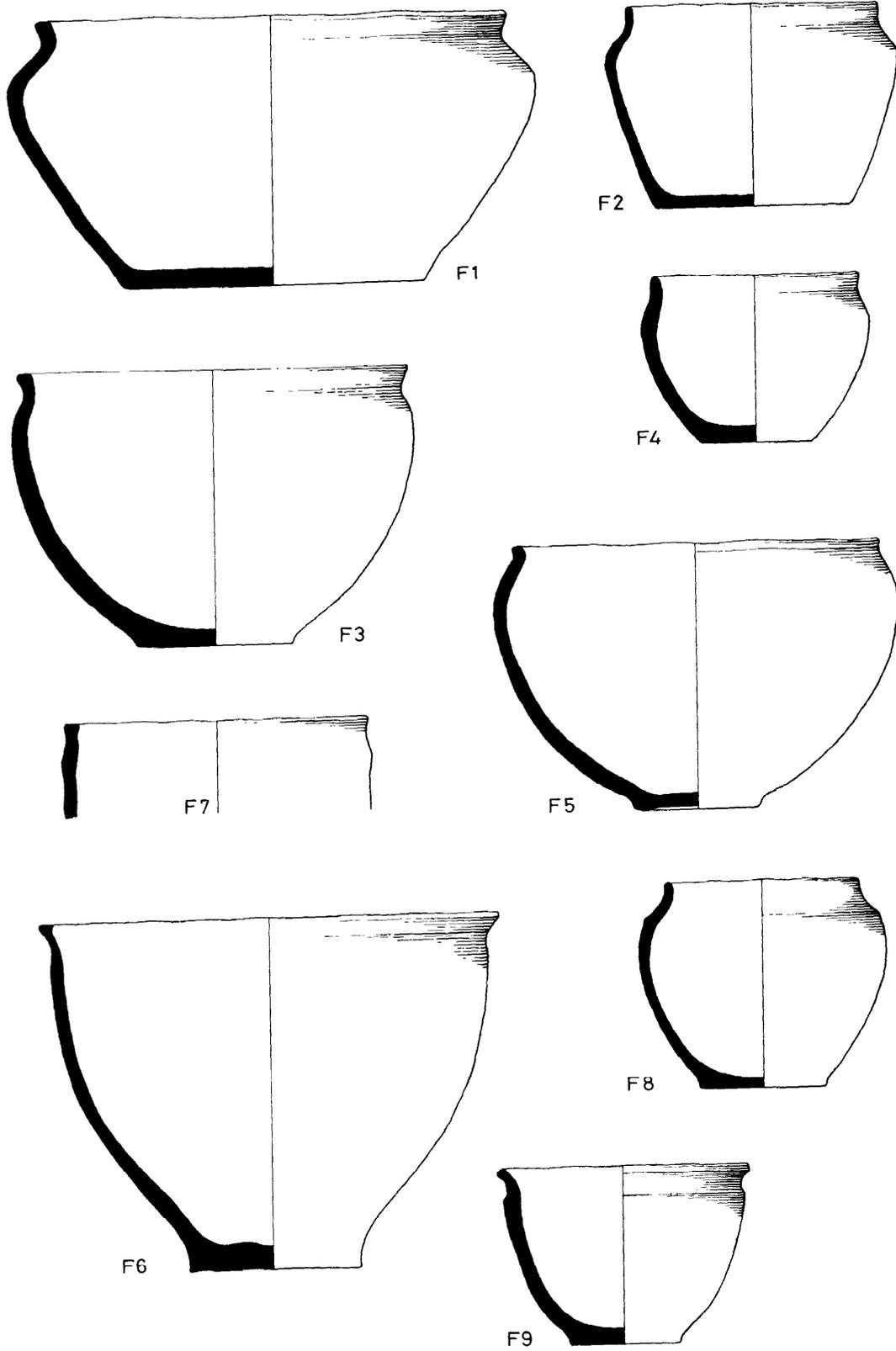


Fig 37 Little Waltham: the type-forms of the Iron Age pottery, 1-9, scale 1:4

Form 2

Jars similar to form 1, except that the rim is vertical rather than everted. There may be an internal bead, eg 156, or a very slight external one, eg 56, 267, though as in the case of form 1 both seem to be due more to technique than design. Both rim and body are undecorated.

Typical examples: 50, 57, 64, 267, and 318.

Like form 1, with which they perhaps ought to be included, these are commonest in Period II, hut group A, but overall representation is too small to enable any valid conclusions to be drawn. The form occurs at Ardleigh, fig 13.1, 5.

Form 3

Jars, often small, with everted rims usually clearly demarcated from the gently curving body. The rim occasionally has an internal bead, eg 35, 314. Other examples, eg 215, 269, seem to be designed to take a lid; if so, the lids were apparently not of pottery. The rim may be decorated with finger nail or finger tip impressions, eg 6, 37, 77, 103, and 214 and the body may be striated, eg 6, 214, 303, and 314. What may be true rectilinear decoration occurs on no 37. Nos 214 and 216 have slight but distinct cordons below the rim; it seems probable that these are deliberate rather than the result of coil construction, since no other ridges occur on these distinctive vessels.

Typical examples: 6, 52, 103, 163, 214, 216, 268, 303, and 304.

Less common in Period III than in Periods II and IV, Occurs at Ardleigh, figs 13.14; 14.19.

Form 4

Jars similar to form 3 except that the rim is vertical rather than everted, and usually plain. It may, however, have finger tip decoration, eg 127, 152, and 272 or an internal bead, eg 30, 94. The body may be striated, eg 40, 222; no 127 has vertical scoring. The thickness of the rim may be substantially less than that of the body at the shoulder, eg 133. The form includes large storage jars, eg 9, 164, and 306, though unfortunately the full profile of these vessels remains unknown; no 94 is a large and very unusual variant of this form.

Typical examples: 22, 31, 133, 152, 180, 222, and 272.

Less common in Period IV than in Periods I and II.

Form 5

Vessels with small, more or less pointed, everted rims and hemispherical bodies. The only two complete profiles (188 and 189) indicate that the form had a footing base. Neither body nor rim is ever decorated.

Typical examples: 171, 188, 189, and 230.

Occurs in appreciable numbers in Period II, hut groups B and C (all single sherds) and Period III; rare in Period II, hut group A, and Period IV. Perhaps derived from form 13.

Form 6

Large jars with vertical or out-turned rims; finger tip decoration is applied to the flat top of the rim, which may be thickened by an internal bead, eg 74,333, to provide a wider surface for such decoration. One example, no 74, is coarsely striated. The walls of the upper part of these vessels are almost vertical but the bases are relatively small.

Five examples only: 74, 294, 308, 328, and 333.

One example from Period II, hut group A (74); two from Period IV (292, 308), the remainder unstratified.

Ardleigh, fig 13.2, is close though rather small.

Form 7

Jars with plain square-cut rims, in the case of 231 decorated

by finger tip impressions on the flat top. The sides are vertical as far as the profiles exist. Three examples only, 231, 296, and 305; one is from Period III (hut C2), the others are from Period IV.

Form 8

Jars with a vertical rim above a concave shoulder, usually clearly demarcated from the body. The demarcation is particularly clear in 157 and 317; the thickness of the wall decreases above, so that its presence is much less marked on the interior of the vessel. The vessels are usually, but not always, relatively small. The rim often has a slight external bead, and may have finger nail decoration, eg 315. The body may be striated, eg 333, or lightly scored, eg 315.

Typical examples: 60, 157, 233, 234, 315, and 317.

Rare in Period II; commonest in Period III but still present in Period IV.

Form 9

Jars and bowls similar to form 8, except that the rim is everted; the effect is often of a continuous 'moulding' forming shoulder and rim, demarcated from the body. The rim frequently has an external bead, and occasionally an internal one. There is often finger nail or finger tip decoration of the rim, eg 17, 198, and the body may be decorated by scoring, eg 17, 198.

Typical examples: 17, 58, 140, 198, and 299.

Occurs frequently at Ardleigh, twice with scored decoration (fig 13.9, 15) and at Mucking, an example from which is illustrated as our 190.

Form 10

Jars whose walls are vertical or near-vertical for the greater part of their height. The wall normally turns inwards at the shoulder and ends in a weakly everted rim, form 10B; no 235 has finger nail decoration. In the case of no 237 the wall sets in at the shoulder and terminates in a near-vertical rim with an internal bead, form 10A.

Typical examples: form 10A—237; form 10B—236, 238.

A single example from Period II, hut C4; the remainder from Period III.

Form 11

Jars and bowls of slack 'S' profile, the rim more or less everted. There is no distinct shoulder or carination, and the rim and body are usually undecorated, though finger tip decoration can occur on the rim, eg 26,242, and the body may be scored, eg 26.

Typical examples: 5, 68, 70, 76, 80, 125, 244, 260, 307, and 310.

The form is less common in Period III than in Periods II and IV. It occurs at Ardleigh, fig 14.20, 27.

Form 12

Jars with a distinct carination towards the centre of the body. The rim may have a slight external bead but neither it nor the body is decorated.

Typical examples: 33, 176, 177, and 311.

Occurs infrequently in all periods, but only once in Period II (no 33), which could be an unusual variant of form 1.

Form 13

Everted-rim bowls and jars, either in imported fabrics (mostly A) or relatively fine local copies. The rim is a flowing curve, thickened internally, and the base is supported on a footing. Neither rim nor body is decorated.

Typical examples: 24, 159, 202, 203, 250, 251, 290, and 324.

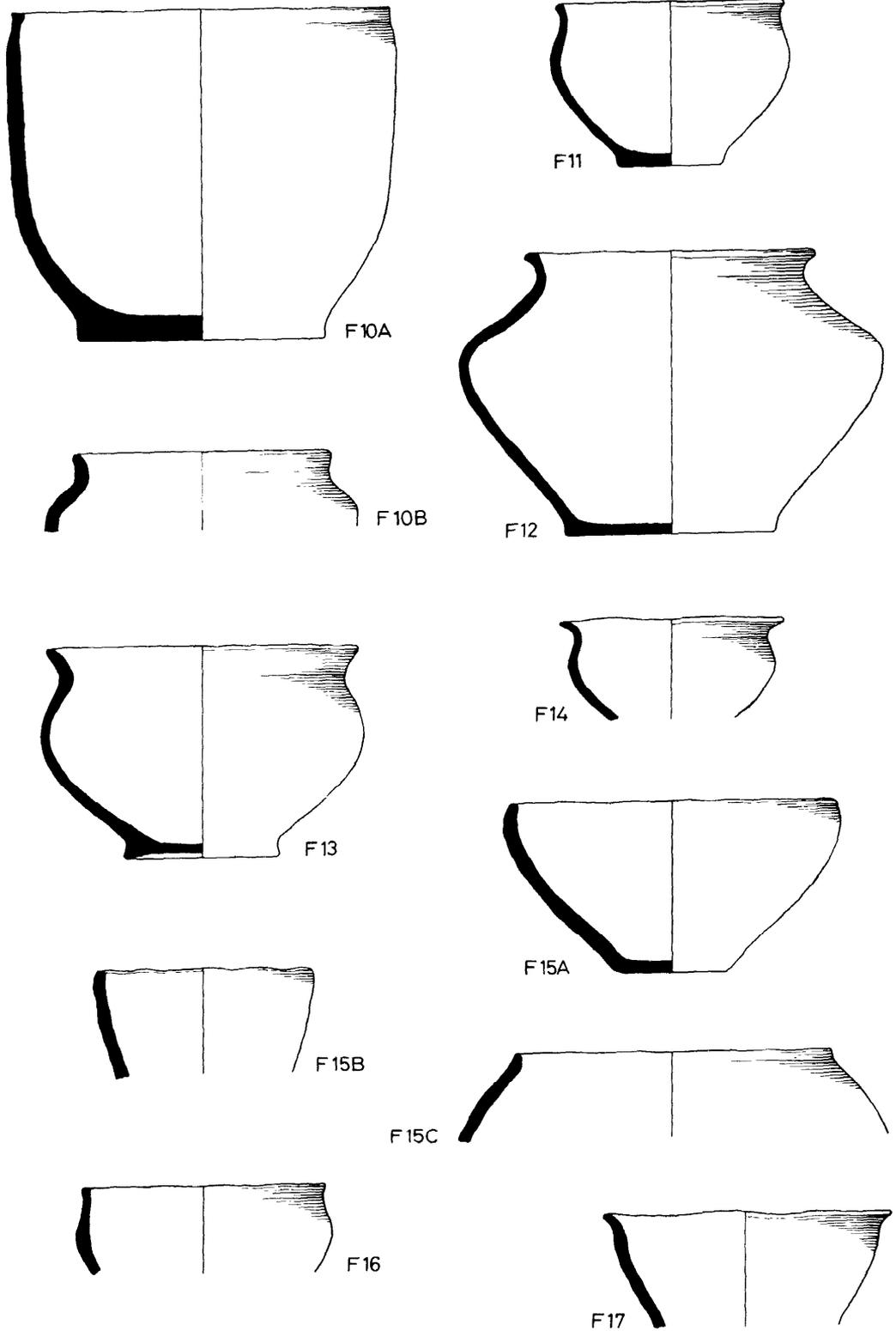


Fig 38 Little Waltham: the type-forms of the Iron Age pottery, 10-17, scale 1:4

This form accounts for some 15% of vessels from Period III, but less than 5% of those from Periods II and IV. It occurs at Chadwell (fig 4.14) and Mucking, and is well known south of the Thames, which appears as its northern limit on Ward-Perkins' distribution map (1944, fig 6; for bowls, see figs 5 and 12). However, it is now known to occur much further to the north, for example at Buntley, Suffolk (Cunliffe 1968, 175). Footrings occur on earlier pottery in the region, however, for example at Darmsden, Suffolk (Cunliffe 1968, fig 3.3 1).

Form 14

Bowls of 'S' profile with elongated, almost cavetto, rims. No 83 is the type form; in the three other illustrated examples, 62, 102, and 204 the shape is less marked, but nonetheless distinctive.

Occurs once in Period II, hut group A, four times in Period II, hut groups B and C, and once in Period III.

Form 15

- A Bowls with pointed, inturned rims. Three examples: 75, 114, and 319; two from Period II, one from Period IV.
- B Shallow bowls with square, slightly inturned rims usually decorated with finger nail or finger tip impressions on the flat top. Four examples: 15, 147, 185, and 193; three from Period II, one from Period III.
- C Bowls with small, pointed vertical rims, below which the hemispherical body flares outwards. Three examples: 16, 55, and 332; the two stratified vessels are from Period II, hut group A contexts.

The form belongs predominantly to Period II, though it is rare there. Form 15A occurs at Ardleigh (Erith & Holbert 1970, fig 16.2) where it was thought to belong to an earlier phase of the Iron Age than the majority of the pottery from the site. It also occurs at Chadwell (Manning 1962, fig 4.5). Form 15A occurs earlier at Darmsden, Suffolk (Cunliffe 1968, fig 3.41).

Form 16

Bowls with the interior of the wall vertical for some distance below the rim, and a shoulder formed largely by a reduction in wall thickness. The rim may tend towards a slight external bead, eg 8.

Three examples: 8 (large), 129, and 316 (small). No 19 is close to this form. Occurs twice in Period II (three times including no 19), and once in Period IV (possibly residual).

Form 17

- A Bowls with a near-straight walls, either vertical or inward sloping, terminating in an out-turned, near-cavetto, rim. Three examples: 23, 264, and 278; one Period II, the remainder Period III.
- B Bowls with steeply sloping walls, a slight offset at the shoulder, and plain or slightly everted rims which may have finger tip decoration. There are combed patches on the shoulder of no 131. Five examples: 27, 91, 108, 131, and 283. All are of Period II except no 283, of Period III.

Form 18

An omnibus classification for 'early Belgic' vessels of various shapes in fabric E, described individually in the catalogue. The principal examples are 286, 301, and 326.

FABRICS

The fabrics were divided on visual criteria into eight groups: A, B, C, D, E, G, H, and J. Of these, A-E were sparsely represented, never accounting for more than 12% of any one period group; all are comparatively fine and A, D, and E are clearly not of local origin. B and C also appeared to be 'foreign', but scientific investigation suggests they could be local (p 62). The commonest fabric, H, accounted for between 79% and 88% of all groups, and this, together probably with fabric J, seems certain to be of local origin. The majority of sherds in fabric G also seem to be of local origin, although petrological examination suggests that some could be derived from another area (p 59). The incidence of the fabrics in each period group is shown in Table 10, which is based on the illustrated vessels only, as representative of the pottery as a whole.

TABLE 10 Incidence of fabric types in the illustrated series

Period	fine (probably non-local) fabrics, %				coarse Fabrics (probably local), %			sample size	
	A	B*	C*	D	E	G*	H		J
Period II—hut group A	—	—	—	1.5	—	11.1	80.5	6.9	72
Period II—hut groups B and C	2.6	—	—	—	—	15.6	79.2	2.6	77
Period II—all features	0.9	—	—	1.3	—	12.4	80.5	4.9	185
Period III—all features	5.9	2.0	1.0	1.0	2.0	8.9	72.3	6.9	101
Period IV—all features	—	—	—	—	9.0	3.0	88.0	—	34

* See p 126 for discussion of origin

Fabric A

Hard dark grey-black fabric tempered with much fine hard grey sand. Vessels in this fabric are always of form 13, usually burnished as no 254 where sufficient of the surface survives to determine the point. This is the commonest non local fabric, accounting for 5.9% of the illustrated vessels from Period III. Its incidence is as follows:

Period II: huts C3, C6, and C7 (no 124), C8, C8A, C9, C10, C14, and C15 (no 149), C16, C17B, and C18; features 59, 60, 72, 75, 82, 87, 96, 141, 162, 163C, 193, 197A, 210, 219, 234, 237, and 246 which contained 30-40 sherds of at least two vessels.

Period III: huts C1 (no 202), C2 (nos 249, 250); features 56, 58, 255, 256 (nos 281, 282), 257, and 263,

Period IV: hut C5, features 165, 171, 173, and 232,

Fabric B

Similar to fabric A, but generally a dark orange brown in colour. Incidence as follows:

Period II: features 163 (1 sherd), 219 (2 sherds).

Period III: huts C1 (no 192), C2 (no 253); features 51, 257 (single sherds).

Fabric C

Fine black fabric tempered with sparse, white, crushed mineral fragments, possibly flint. The exterior, where not abraded, has a glossy, intensely black surface which appears to be a coating (see p 63). Similar pottery forms the normal fine ware at Wendens Ambo (fig 71, site 10; I A Hodder, pers comm) and has been noted at Orsett, near Mucking (H Toller, pers comm) but no petrological comparison has been attempted.

A single example from feature 16, Period III; no 261.

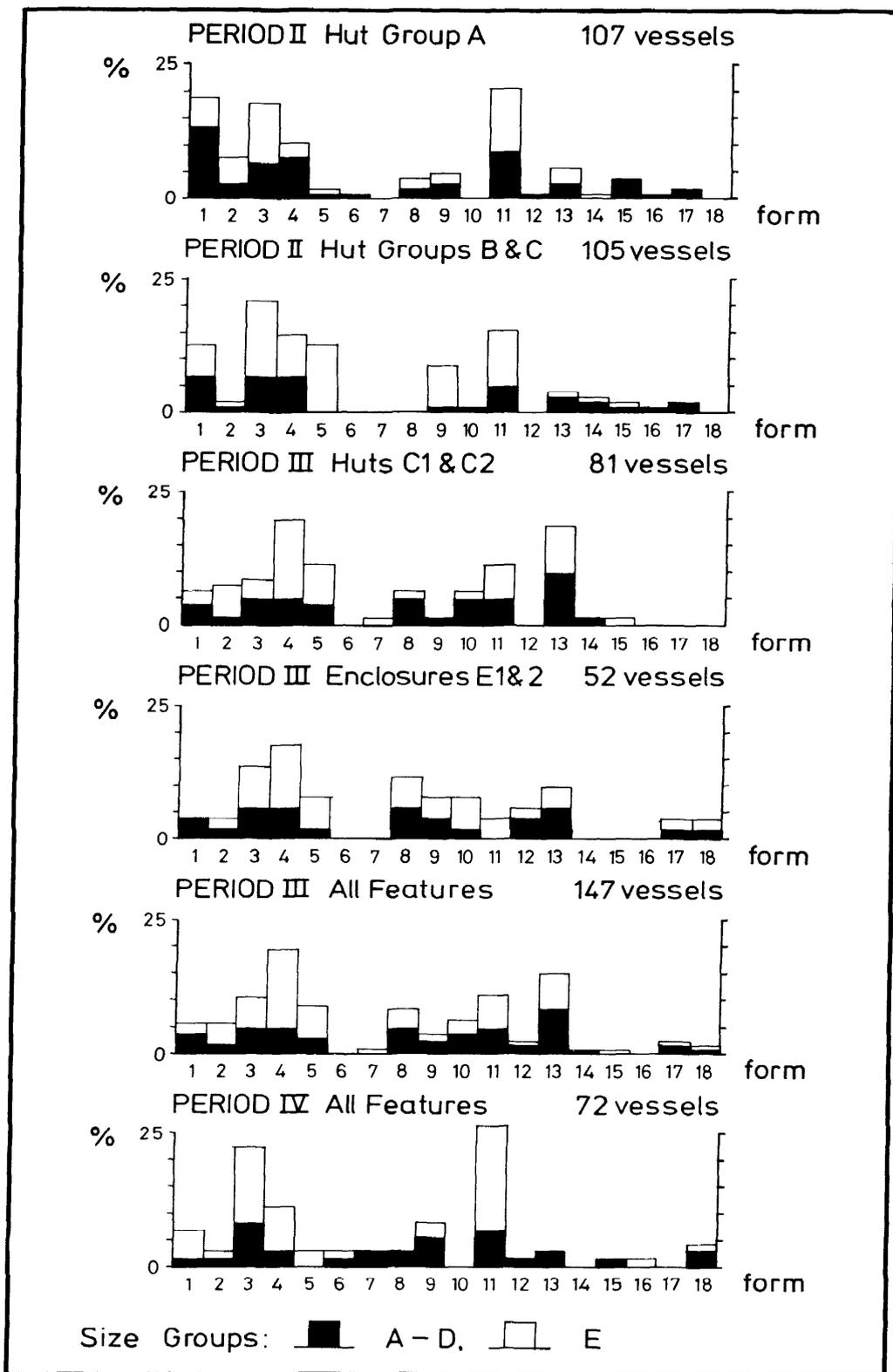


Fig 39 Little Waltham: diagram to illustrate the relative incidence of the type-forms of Iron Age pottery in each period of occupation

Fabric D

Fine grey fabric with very fine sand tempering and dark grey flecks. The subsurface is usually brown and the surfaces, especially the exterior, dark brown-black. Its incidence is as follows:

Period II: hut C11 (no 25); feature 96 (no 162); feature 162 (no 169);

Period III: hut C2 (no 251).

Period IV: hut C5, fragment, burnt.

Fabric E

An omnibus classification for early Belgic fabrics, usually grey-brown, rather granular. The fabrics of the illustrated vessels are described in the catalogue and are typical of the range present. Their incidence is as follows:

Period II: single sherds from hut C3, features 87 and 96; some ten sherds from hut C15; all probably intrusive.

Period III: hut C1 (2 sherds), features 255 (no 266 + fragments), 256 (no 286).

Period IV: hut C5 (no 295); features 165 (no 301) and 232 (no 326).

Fabric G

Fine dark grey-black fabric tempered with vegetable material, and occasionally a little fine sand. The surfaces often have vegetable impressions visible and vary in colour from red to black. Commonest in Period II; its incidence declines in Periods III and IV.

Fabric H

Dark grey to black fabric tempered to varying degrees with sand, and occasionally a little vegetable material. The surfaces often have vegetable impressions. Surface colour varies from buff to black, the exterior tending to be oxidized to a greater extent than the interior. Vessels in this fabric form the bulk of the pottery in all periods, and it seems certain that it was made, if not on the site, then in the vicinity. It is notably finer in Periods III and IV than in Period II.

Fabric J

Fabric similar to fabric H except that it contains crushed calcined flint, usually in addition to, rather than in place of, sand tempering. It never accounts for more than 7% of the vessels in any one period, and does not occur at all in the (relatively small) sample from Period IV.

DECORATION

Decoration of the vessels is both infrequent and simple. The two basic types are finger tip or finger nail decoration of the rim, and more or less vertical scoring or striation of the body. Table 11 shows that these features occur on about 13% and 10% respectively of vessels in each period; such decoration is not, therefore, chronologically significant.

An interesting variant of vertical scoring is scored rectilinear decoration, with distinct patterns. This occurs on nos 98, 99, and 100, from Period II, hut C3, all unfortunately too small to indicate the form of the vessel. Other vessels carry scored lines which, whilst they do not form any coherent pattern, are clearly not in the normal run of vertical scoring exemplified by no 17. These are as follows:

Period II: 26 (from C11, form 11), 37 (from C14, form 3), and 101 (from C3).

Period III: 255, 256 (from C2), 259 (from F7, form 11), and 279 (from F255).

Patches of diagonal combing appear on the shoulder of no 131; this finds a possible parallel at Ardleigh on a vessel

of different form, fig 13.8. Fine burnished cross-hatching above a fine horizontal burnished line occurs on a single sherd, no 192 in 'non-local' fabric B from hut C2. The significance of this sherd is discussed below (p 131)

TABLE II Incidence of decoration in the illustrated series of pottery

	Period II	Period III	Period IV
1 Finger tip, etc. decoration of rim	13.5%	13%	11.8%
2 Scored or striated body	9.2%	10.9%	14.6%
Sample size	185	101	34

Notes

Line 1 includes all variations of finger tip and fingernail decoration of the rim.

Line 2 includes all forms of basically vertical scoring and striation, and sherds of vessels with rectilinear decoration. In any one period group approximately half the vessels are striated and the remainder are either scored or are decorated with rectilinear patterns.

The percentages for Period IV are likely to be less reliable than those for the other periods, in view of the relatively small size of the samples. The true incidence of decorated sherds in Period IV is probably similar to that in Periods II and III.

Vessels decorated on both rim and body have been counted in both lines 1 and 2.

The scientific examination of the Iron Age pottery

This section has been deliberately kept separate from the foregoing, initial visual appraisal so as to allow independent, individual evaluation of the fabrics as far as possible. Modifications suggested by scientific examination are outlined at the end.

Type specimens of the principal fabrics were examined petrologically. X-radiographic comparison between these and all other *illustrated* sherds was then carried out, to confirm the broad classification and provide a more objective basis in detail, particularly for the 'coarse' pottery.

1 PETROLOGICAL EXAMINATION

D P S Peacock and D F Williams

Many of the sherds submitted were examined in thin section under the petrological microscope. Fabric A (S-1, P1 XVI) appears to be highly distinctive and it contains numerous rounded particles about 0.2-0.3mm across which are translucent and sometimes appear to have a concentric structure. Identification is difficult but it is probably glauconite, altering to limonite with further complications from firing. Occasional grains of quartz of a similar size grade are also present, and the inclusions are set in an optically anisotropic matrix with few clastic particles. This fabric is identical in thin section to sherds from Birchington (S-18), Holwood (S-19), and Oldbury (S-20, P1 XVII), Kent, and it compares in the hand specimen with sherds from Gun Hill and Mucking, Essex.

It is possible that the material was quarried in a number of different places as glauconite occurs in the Greensand, Thanet Sands, the Reading Beds and parts of the London Clay. However, the close textural similarity of Little Waltham fabric A and Kentish material is a strong argument for regarding it as emanating from a single source.

Fabric D (S-5) is mineralogically similar to fabric A but it is finer-grained and contains more quartz. In thin section it closely resembles other sherds from Holwood, Kent (S-21), and Billericay, Essex.

One sherd of fabric B, and several of H (including nos

211 and 240) appear very similar under the petrological microscope, comprising abundant quartz in two sizes—(a) angular to subangular grains, 0.10 mm and below; and (b) subangular to subrounded grains, average size 0.30–0.60mm, together with a small amount of feldspar, a fair scatter of fragments of flint, and some mica. Mineralogically, these fabrics compare favourably with a thin section taken from a sample of brickearth from the site, and a local source is possible.

The single sherds examined of fabrics C (no 261, Pl XIV) and J have the same (type) range of inclusions as fabrics B and H, except that fabric C has well-sorted *equal-sized* quartz grains instead, and fabric J contains considerably more (added) flint fragments.

Inclusions of grog, crushed-up pottery fragments, were recognized in fabric E (nos 286 and 301), with little quartz, which accounts for the soapy feel of the sherds in this group. Grog tempering is not a common feature during the Iron Age; it has previously been noted by the writers in some globular bead-rim jars from Hascombe Camp and Holmbury, Surrey.

Two specimens of fabric G (nos 53 and 221) contain much quartz and quartzite together with occasional volcanic grains and some hornblende. The drift of East Anglia and Essex is known to contain volcanic material, but equally, this fabric could be imported from the other side of the North Sea. Two other specimens of 'fabric G' (nos 89 and 332) are quite different in thin section from these and from each other: similarly, no 309 is unlike the other fabric H specimens examined. All three contain varying amounts of quartz and some quartzite.

2 COMPARATIVE X-RADIOGRAPHY

Leo Biek and Justine Bayley, with P J Drury

As previously indicated (Biek 1969) X-radiography provides a rapid, easy and efficient, non-destructive way of scanning large quantities of pottery for comparable or distinctive features in the fabric. The overall significance and degree of usefulness of such a scan will depend, in any specific project, partly on the correlation between petrological and X-radiographic characters. In the present case it is clear that the nature of the temper in fabric A permits firm and easy detection by X-rays. In the same way, but inevitably to a lesser extent, X-rays are helpful in picking out type D fabric. Fabric B (same sherd as in 1, above) is also obviously distinct but the reason is less clear. On the other hand, the single specimen of fabric C shows a generalized picture rather similar to the 'coarse' wares.

The difficulty in comparing the coarse wares stems from this overall generalized, and petrologically indeterminate, texture in which substantial variations can be seen but not firmly interpreted. The actual significance of such distinctions is thus difficult to assess as the statistical variations of both radiopaque and grass temper (void) patterns within individual, whole pots could not be adequately gauged; nor is there enough information on the natural variability of radiopaque grains in the possible raw material, brickearth and clay, from the site, despite the complementary examination of burnt clay (p 114). Within these limitations there are nevertheless certain conclusions that can be put forward as a basis for more detailed investigation.

The X-radiographs of certain sherds were chosen as type specimens. For convenience, the initial selection followed the series of samples as first submitted by the excavator, giving five major groups which appear to be broadly distinct in X-radiograph. Detailed visual matching was then carried out at $c \times \frac{1}{2}$ magnification and with the aid of suitable masks, each type specimen being compared in turn

with every other sherd's radiograph individually. In the course of this meticulous examination it soon became clear that far finer distinctions were possible, and indeed necessary, than was at first thought. Accordingly a number of additional, intermediate type specimens were similarly matched against all other radiographs; and because of the relatively mechanical matching process a number of radiographs were found to have been classified as fitting into more than one type group. This led to a further refinement in defining relationships between types. Finally, the 310 available radiographs were checked for internal consistency within 30 groups, the 10% type/total ratio being reasonable and normal in the circumstances.

The matching was carried out on the basis of variation in the two primary characters, radiopaque grit (density, frequency, size, shape, etc) and radiovoids (predominantly of vegetable temper (frequency, size, shape, texture, etc)). In a few cases the radiopaque grains were seen in the radiograph to lie within edges of sherds where they could be located with ease and certainty and examined without damage. Some of the larger of these were studied, and all were found to be essentially ferruginous concretions, such as were present in the brickearth (p 7, Table 1, sample 6). Other particles consisted of hydrated iron oxides in a denser, more coherent form.

The criteria used in this comparison are clearly in some important respects different from, and thus complementary to, those in both normal (archaeological) visual appraisal, on the one hand, and petrological examination on the other. They are independent of superficial 'finesses', colour and texture, which can often be misleading; yet they permit distinctions in grit and, particularly, 'grass' pattern at a level not normally investigated petrologically. In that sense it is possible to use them-effectively for a highly objective general classification of fabrics.

The results are summarized in Table 12 and Fig 40A, and typical radio-patterns are shown in Pls XXII–XXXII.

It had been clear from the start that the primary archaeological, visual division of the coarse pottery into fabric groups G, H, and J was likely to prove inadequate. It soon became equally clear that radio-grouping cut-across these divisions so much that a completely fresh start was needed. The proximate descriptions given in Table 12 indicate the nature and range of the first-order distinctions that can be made clearly and simply, and Fig 40A shows possible relationships between these main groups.

TABLE 12 Comparative descriptions of main features of principal radiofabrics used in classifying the Iron Age pottery (see also Fig 40A and Pls XXII, XXVI–XXVIII, xxx, XXXII)

Fabric	Description
R 1	'Simple, straight, normal'—average void size and radiopaque grain distribution
R 2	Minimal grain. Long, thin 'grassy' voids (high length/width ratio)
R 3	Preponderance of short, thick voids (low length/width ratio); high grain frequency, particularly of larger, rounded, medium-density particles
R 4	Similar to R3, fewer voids, mostly larger (lower length/width ratio); medium frequency of the rounded grains
R 5	Minimal grain; virtually void-free
R 6	Similar to R2 but medium void pattern (intermediate length/width ratio)
R 7	Minimal grain; most voids square, oval or triangular (lowest length/width ratio, approaching 1)
R 8	Similar to R1 but with lower length/width void ratio, and less grain
R 9	Similar to R1, much lower length/width void ratio
R 14	Similar to R3, but much higher grain frequency

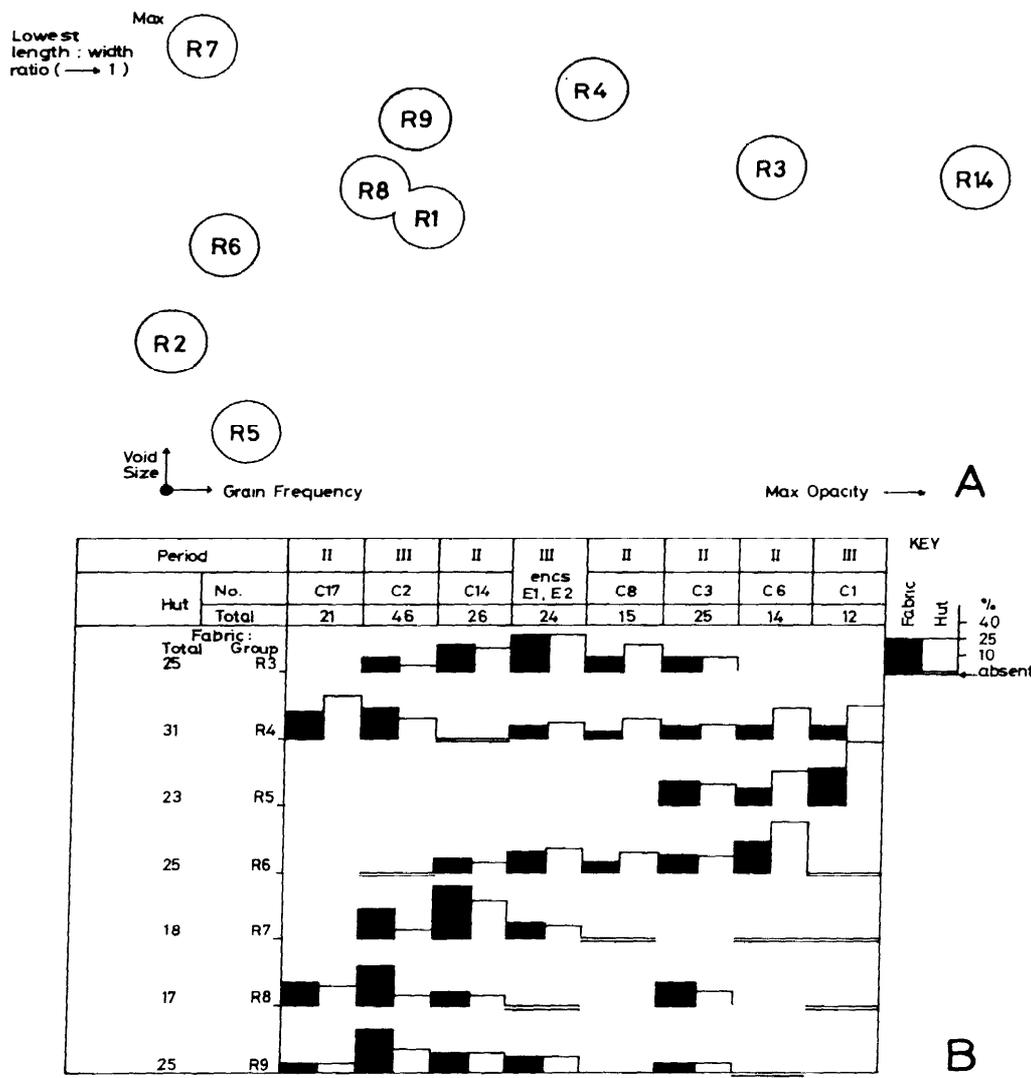


Fig 40 Little Waltham: course pottery radio-fabrics-
A principal characteristics: (vegetable) 'void' and (mineral) grain pattern
B relative frequencies in huts. Note highly exclusive distributions of R5 (C1), R6 (C6), and R7 (C14)

There is as yet insufficient systematic information to allow greater confidence than has been expressed here about the depth of (archaeological) meaning which can justifiably be extracted from these results. The work is part of a larger project to be reported elsewhere. From the data so far available, however, there would appear to be sufficient range in both variation and perception to encourage the belief that the observed distinctions are both valid and significant in every case that has been studied.

The information can be evaluated in two principal direc-

tions. The first is plain from Fig 41. If one makes the simplest division by basic 'form', into three degrees on three levels, any correlation between 'form' and radio-fabric will appear as a possible preference against a background of random 'noise'. In the case of the 'simple, straight and normal' type R1, it is clear that it was used indiscriminately down the range of 'form'. In a complementary sense, medium-sized pots of medium thickness were evidently made in all fabrics, across the whole range.

In contrast, the two largest groups, R3 and R4, between

			R1	R2	R21	R22	R3	R4	R5	R51	R6	R61	R7	R71	R72	R8	R9	R10	R11	R12	R13	R14	R15		
LARGE	THICK	SIMPLE																							
		AVERAGE	.				.	.						.			.	.
		ELABORATE						.	.								.	.
	MEDIUM	SIMPLE	.														.	.							
		AVERAGE	.														.	.							
		ELABORATE						.	.								.	.					.
	SLENDER	SIMPLE																							
		AVERAGE																							
		ELABORATE	.	.								.													.
MEDIUM	THICK	SIMPLE	.				.	.						.
		AVERAGE					.	.						.										.
		ELABORATE	.				.	.						.				.
	MEDIUM	SIMPLE	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		AVERAGE					.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		ELABORATE	.	.			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	SLENDER	SIMPLE																.							
		AVERAGE			.							.						.							
		ELABORATE		.								.	.					.
SMALL	THICK	SIMPLE					.	.	.					.		.	.
		AVERAGE			.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		ELABORATE	.		.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	MEDIUM	SIMPLE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		AVERAGE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		ELABORATE	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	SLENDER	SIMPLE									.						.								.
		AVERAGE									.						.								.
		ELABORATE

Fig 41 Little Waltham: coarse pottery fabric—tentative correlation with basic form. Note general use of R3 and R4 (down) but also central 'popular band' (across)

them accounting for only 28% of the total pottery, show a clear concentration of 67% (shared about equally) in the area of thick medium-sized pots. This link between R3 and R4 would, furthermore, seem to be a constant feature down the basic form range. The most popular band of pottery (small vessels of medium thickness, 42%) shows an entirely different pattern—only 28% of R3 + R4 (a useful internal marker, here, exactly equal to their overall frequency), but instead much higher relative proportions of several other fabrics, notably R6 (44% of type) and R9 (50% of type) which together, again, make up another 28% of this pottery 'form'. Minor points include an apparent preference for R3 and R4 in making large thick pots, but also for R4 for small thin vessels, especially those with decoration or elaborate profiles.

The nature of the archaeological evidence makes it harder to evaluate the data in terms of spatial distribution and, hence, possibly of sequence. With a few exceptions, the spatial groups (largely from huts) are either too small or incomplete, and any bracketing tends to defeat the object of this part of the sorting. Tentative correlation on this basis has been attempted. The kind of suggestion that emerges is, for example, a high proportion of thick pots (in radio-fabrics R3 and R4) in hut C8 (deep wall trench), as against an even greater preponderance of small vessels of medium thickness in hut C6 (shallow wall trench), nearly all of 'average profile' and mostly in fabrics R5 and R6. The only thick pot in hut C6 is fabric R4 and is decorated; another decorated vessel, of medium thickness, occurs in fabric R3.

In the same way one can contrast huts C14 (deep wall

trench) and C3 (shallow), but the results are rather different. Nearly 40% of all the pots in C14 are small, of medium thickness and elaborate design, and they represent a concentration of a quarter of all such (illustrated) pots found on the site, in one hut. Another 27% of the hut total is made up of similar pots of 'average' design, and altogether over three-quarters of the pottery is small—a slightly higher proportion than the hut average overall, at less than two-thirds. Rather more interesting, and possibly significant, is the fact that all thick pots, and some of medium thickness, together representing 27% of the hut total, are of fabric R7. Perhaps more important still, almost 40% of all the (illustrated) pots in fabric R7 found on the site come from hut C14; this fabric happens to be a uniquely useful marker, on this site, coming as it does from huts only.

Hut C3 contained a somewhat lower proportion of small pots of medium thickness (52%), but again there is a concentration of fabric even if less pronounced: of all medium-thick vessels (72% of hut total) a third are in fabric types R5 and R6. Overall, 28% each fall to fabrics R3 + 4, R5 + 6 and also to (the similarly related) fabrics R1 and R8; 40% of the pots in hut C3 are 'elaborate' (compared with under a third, the overall hut average) but there is no suggestion of preferred fabrics for them here.

It was thought that the two shallow-trench huts with polygonal plan, C15 and C18, might differ from the others but the few pots found in them do not radio-group distinctively. They are all small, nearly all of medium thickness, and the only possibly notable feature is that nearly two-thirds of them fall into the 'simple' design category—a frequency nearly twice the overall average.

In hut C1 the situation is in a sense reversed: there is a dominance of R5 which accounts for all the (third of) small medium-thick 'average' vessels and indeed for half the total. Most of the pots are small but only two-thirds are thick or medium-thick, indicating a proportion of thin pots about double the overall average.

Hut C2 is interesting in that it yielded the largest hut group, 20% of the illustrated total, and the proportions of various features varied significantly from the average. Thus the ratio of large: medium: small pots was 1: 2: 4 rather than the average 1: 4: 8; and that of simple: average: elaborate vessels 3: 3: 5 (as against 3: 4: 4); yet the proportion of thick: medium: thin pots corresponded exactly to the average 2: 4: 1. But apart from a slight concentration of R9 (27% of both overall fabric, and medium-thick pot in hut) the distribution pattern is disappointingly lacking in any indication of grouping.

If one now looks at the pattern (Fig 40B) for differences linked to archaeological phasing it seems that absence might at least be equally significant. This would be fully valid only in large groups, but could well be useful in the case of R4 in hut C14, and especially for R6 in hut C2 (possibly with C1). Overall, the picture confirms the earlier impression that some fabrics were in general use—as, for instance, R4 throughout the whole period; and that some huts contained a greater range than others, particularly huts C3 and C6 which are strikingly similar in several respects. On the other hand it is interesting to see an almost clear-cut division between the closely related R3 and R4, both within and across the period boundary, and even under the obviously restricted conditions the differences also look real enough for the other fabrics shown. In this connexion it seems justifiable to see the deposits in the two palisaded enclosures as at least partly residual.

A close scrutiny of 30 specimens described as fabric G is at first encouraging. Overall, about equal proportions of R6, R7, and R9 make up three-quarters of this group, the

rest being divided equally between R3 + 4 and R2. The hut and period distribution reflects the general picture (Fig 40B) and the high concentration of R7 in hut C14 is now seen very largely in terms of 'fabric G'.

The sherd (no 53) mentioned in Part 1 above as containing volcanic inclusions falls into radio-group R3, however, which must be regarded as one of the two most frequent groups that have a wide scatter across huts and periods and are clearly mostly of local origin. The one earlier prehistoric pot accidentally included in the survey corresponds to fabric R7, which on this and other grounds would also be seen as of local origin.

Although confirmation must await the results of projected experimental work, a general hypothesis to account for all the observations made so far may be put forward here and now, based on these main features:

- 1 The basic raw material ('clay') is variable enough to provide small and very localized scoops with highly distinctive, natural radiopaque patterns, or, indeed, lacking radiopacity altogether.
- 2 Deliberately added vegetable temper could reflect seasonal as well as any regional and idiosyncratic variation—for instance, R2 ('grass'), and R7 ('chaff') may be largely 'spring' and 'autumn' variants of the same basic fabric.
- 3 The firing throughout is poor enough to suggest the use of very simple 'bonfire' clamps taking advantage of the *time* factor in the time-temperature product governing pottery formation, rather than the temperature element.
- 4 Under such conditions the atmosphere around a pot, or even part of a pot, could change several times during the (somewhat protracted) course of a single firing, and give rise to considerable variation (particularly) in colour both on the surfaces and across the section—this could in some cases produce an illusion of 'refiring' (though not where so called in the text).
- 5 Despite the imprint which burning huts have left on the site, it is possible that some, at least, of the ubiquitous 'fired clay fragments' are derived from such primitive clamps which could have been destroyed without much effort—and perhaps as a deliberate routine of levelling and spreading—in any event far more easily than the huts.
- 6 These considerations are probably of wider significance—thus (a) fabrics of 10 sherds from Billericay, kindly supplied by S Weller for comparison, radio-grouped in a similar fashion—indeed, some specific correlations were possible and one specimen (no 13) actually gave a match for the unique fabric B sherd; (b) the 'finer' fabrics are mainly so in surface finish, and not obviously better fired.

More specifically it is interesting that the single fabric B sherd (of 8) which was examined could, mineralogically speaking, be 'local'; its radiotexture, however, is unique (at Little Waltham). The single fabric C sherd, on the other hand, would appear from both examinations to be 'local'. With regard to the volcanic grains noted in the petrological report on some of fabric G, both limited (Perrin *et al* 1973) and wider (Clayton & Straw, forthcoming) surveys indicate that various types of igneous-rock particles are more likely than not to be present in the Essex boulder clays. Although this feature requires further clarification in the projected experimental work, present results make its diagnostic character somewhat doubtful.

The correlation of visual and scientific classification is discussed below (pp 125–6).

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The remaining portion of the only pot in this fabric (no 261, p 81), with essentially pale brown surfaces, carries extremely patchy residues of black material irregularly distributed over most, but not all, of its outside. Despite its relative ('nail-scratchable') softness, and the vagaries of its history (at least) from burial to reconstruction with glue, the pot is preserved well enough to allow a number of observations and statements to be made with sufficient confidence.

Overall, the highly distinctive nature of the black material makes it clear that the whole of the (remaining) outside surface would (originally be intended to) have carried the coating. Superficially, this could be described as a jet-black glossy layer reminiscent of 'Greek black', with high specular reflectivity giving it a bright 'metallic lustre' appearance at a certain angle.

Under the binocular microscope the surface is seen to be remarkably intact within each small patch of continuous residue, and can thus be accepted as original. The fine structure of the very smooth surface shows flow lines, bubbles, and even rare vestiges of brush marks, as well as a characteristic crackle developing into flaking and very slight curling at the edges of such flakes.

It is thus clear that the layer had set from being at one stage present—and had, indeed, almost certainly been applied—in the liquid state. At the same time, although adhesion had evidently been very good, the (seemingly rather viscous) liquid had not obviously penetrated into the pot surface.

At the National Gallery Laboratory, swabbing with chloroform took off some surface encrustation and dirt but left the main glossy layer totally unaffected. The gas chromatogram of a tiny sample of it shows no trace of the diterpenoid components one normally associates with a softwood pitch. Indeed, the early part of the chromatogram seems quite void of the neutral and acid fragments that one would expect from either soft- or hardwood pitches. There was no evidence, either, of any bituminous materials. Traces of acids associated with non-drying fatty material were found, but this would be expected at this level as a typical contaminant. It thus seems that the black layer is an inorganic glaze rather than a paint with an organic binder.

The analytical scanning electron microscope at the Laboratory of the Government Chemist showed only a rather weak spectrum of inorganic components. Against a background of iron, calcium, silicon, aluminium (all major quantities), potassium, and titanium (minor amounts), which it had in common with the pot substrate, the black layer showed significant differences only in a slightly elevated iron content and a distinct peak for sulphur. This latter is near the gold peak due to sputtering in specimen preparation, but a careful check confirmed that the sulphur peak was significant.

More work is clearly necessary on larger quantities of material than were available, and also on comparable pottery from other sites such as Orsett and Wendens Ambo (p 56): one may well need to go even further, possibly to Gaul or the Mediterranean, in search of origins. From the present evidence it is possible to say only that the coating itself is inorganic, clearly distinct from the pottery base, and has been applied as a slurry or varnish, most probably after the pot had been fired. The full significance of the sulphur cannot at present be realized; in conjunction with the increased iron content, it could point to the use (from pyrites) or incidental formation of iron sulphide which in finely divided form is a deep black. Equally the 'extra' iron could be present, at least in part, as 'black iron oxides'

(wüstite, magnetite). (There was indeed found to be a clear magnetic reaction in glossy fragments of the pottery, but this could not be distinguished from a similar reaction in fragments lacking gloss.) In the absence of any obvious binding medium the possibility of a brief re-firing (under reducing conditions) to produce a siliceous glaze suggests itself; yet it is difficult to see how such a delicate surface could have survived the clamp firing which has here been postulated in general for the coarse pottery (p 62), but which may, of course, not apply to this 'relatively finer' ware. The coating has certainly not been burnished although some attempt may have been made to smooth the pottery surface before it was applied.

At first sight the refinement of the surface coating may appear out of key with the 'coarseness' of the ware. And yet the processes involved in producing—reversibly according to 'kiln' atmosphere—*terra sigillata* red or Greek black types of gloss, as described by Bimson (1956), basically require only special, illite-rich clay. Adequate temperature control is less important for the black product and 'smoky', direct-firing conditions in fact work in its favour. A primitive potter may thus be far more likely, with the right clay, to produce such a black gloss under 'ordinary' firing conditions—almost by accident—than classical examples have led us to believe. It is interesting that Bimson also notes the presence of special, non-local, clay 'packed in pits around the kiln site' and evidently used to make the *terra sigillata* at Colchester.

Catalogue

Where no surface colour is noted it can be assumed that this was the same as the core of the fabric, in the case of fabrics G, H, and J, dark grey-black. The sequence of the catalogue broadly follows that of the description of the excavated features in section IV of this report. Numbers prefixed by R are radio-fabric numbers (see p 59 above).

PERIOD II

Fig 42 Hut C8A, wall trench

- 5 Fabric H (R9) with a little vegetable tempering, dark brown surfaces with lighter patches on the rim. Faint vertical striations on the exterior. C. Form 2.
- 6 Fabric H (R1), heavily tempered with coarse sand. Orange-red to brown exterior, with coarse vertical striation now heavily eroded; the top of the rim is decorated with oblique finger nail impressions. B. Form 3.
- 7 Fabric H (R3), with vegetable tempering, dark brown surfaces. Large-diameter vessel. E. Form 4.
- 8 Fabric H (R10), finely tempered dark brown surfaces. Diameter *c* 40cm. C (shattered). Form 16.
- 9 Fabric H (R4), dark brown exterior except one sherd burnt red after breakage. Diameter up to 40cm. C. Form 4.
- 10 Fabric H (R3), with vegetable tempering, orange-red exterior darkening towards the base. D (v large).

Not illustrated: form 1,1; form 2,1; form 3,1; form 8,1; form 11,1.

Hut C8B, wall trench

- 11 Fabric H (R4), E (large). Form 3.
- 12 Fabric H (R8), hard dark brown surfaces. C. Form 3.
- 13 Fabric H (R 10), including large grits and vegetable tempering, fairly soft: orange-red exterior, interior shattered. C. Form 4.

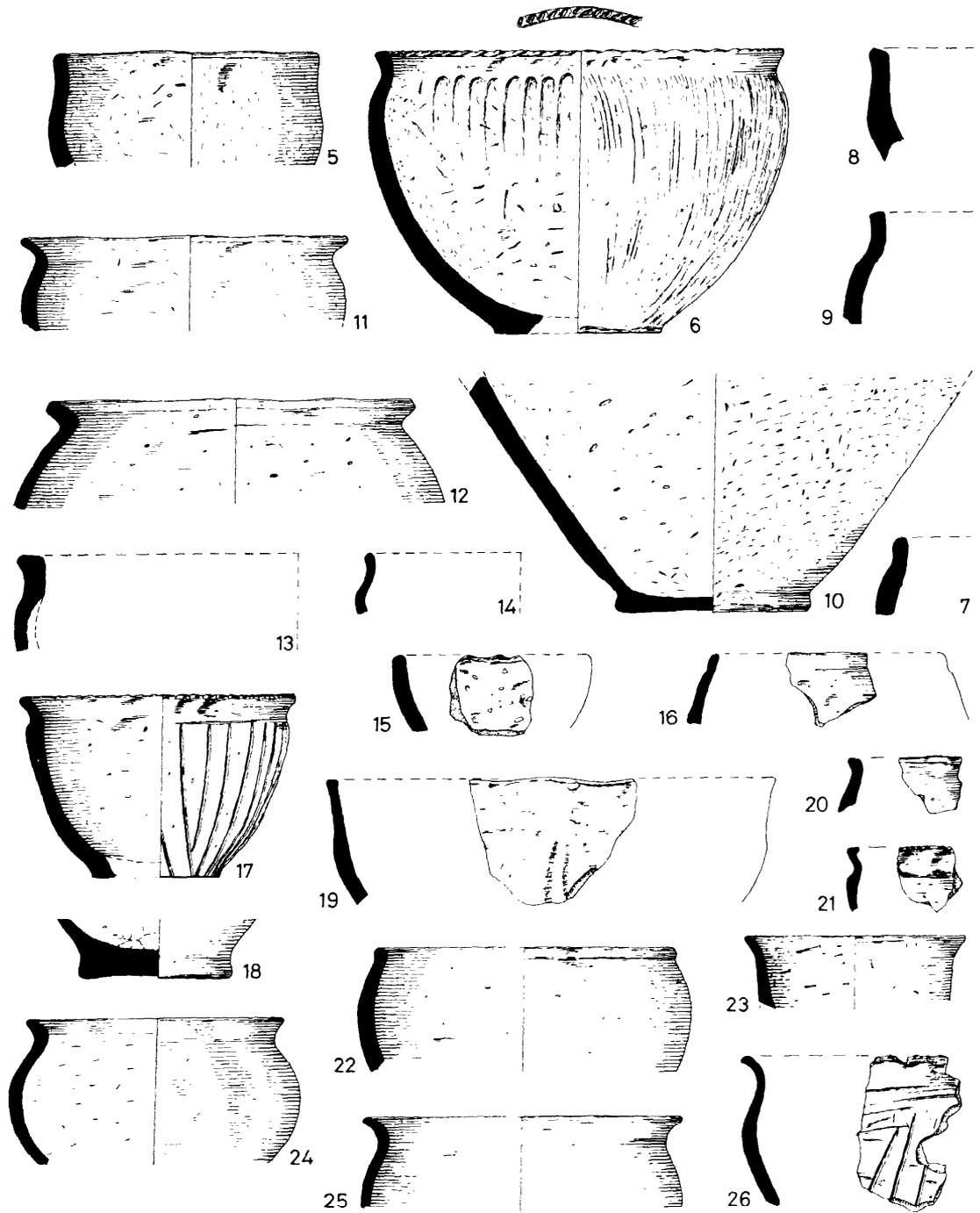


Fig 42 Little Waltham: pottery of Period II, 5-26, scale 1:4

- 14 Fabric J (R6), some vegetable tempering. D. Form 1.
- 15 Fabric H (R3), Coarse tempering includes large grits and some vegetable matter; reddish-brown surfaces. Oblique finger tip decoration on the rim. D (one sherd not illustrated). Form 15 B.
- 16 Fabric H (R1), brown patches on surfaces; one sherd, burnt after breakage, is not illustrated. D. Form 15 C.
- 17 Fabric H (R51), orange-red to brown exterior decorated with vertical scored lines. The rim has lightly applied nail impressions. B. Form 9.
- 18 Fabric H (R6), brown to black, fairly coarse exterior. C.
- 19 Fabric H (R1), with vegetable tempering; interior, and exterior below rim, are dark brown. C. An unusual vessel, probably the top of a large jar rather than a bowl; it finds a close parallel at Darmsden, Suffolk (Cunliffe 1968, fig 3. 35).
- Not illustrated:* form 3,5; form 5,1; form 9,1; form 11,3; form 13,1.
- Hut C11, wall trench*
- 20 Fabric H (R51), finely tempered with sand with single small chalk and some white flint inclusions; dark brown surfaces with burnished but abraded exterior. D. Form 5.
- 21 Fabric H (R72), unusual profile with irregular finger impressions on the neck, (perhaps accidental) and rim decorated with nail impressions. Traces of external burnishing. D. Form 1.
- 22 Fabric H (R3), C (partly non-joining), Form 4.
- 23 Fabric H (R61), coarse with vegetable tempering; exterior possibly once burnished, brownish patches on surfaces. D. Form 17A.
- 24 Fabric G (R2), fine black micaceous fabric with a little sand and sparse vegetable tempering. The exterior has been burnished but retains a few vegetable impressions; the interior is eroded. B. Form 13.
- 25 Fabric D, burnt, eroded and discoloured by secondary firing. The fabric is flecked grey, the sub-surface brown, and the surface dark grey. C. Form 13. From the south butt end.
- 26 Fabric H (R5), with vegetable tempering, burnt orange after breakage. The rim is corrugated and the body decorated with incised lines, probably in a random pattern, though the sherd is too small to be certain. D. Form 11.
- Fig 43
- 27 Fabric H (R3), fairly soft; exterior red to brown, interior dark brown, coarsely finished. C. The rim has coarse finger tip decoration. Form 17 B. From the base of the ploughsoil near the south section of the wall trench.
- 28 Fabric J (R8), fired orange-brown on the surfaces. Slight traces of finger impressions on top of rim. E. Form 11.
- Not illustrated:* form 8,1; form 11,2.
- Hut C14, wall trench*
- 29 Fabric H (R9), with vegetable tempering; dark brownish-grey exterior, both surfaces probably once burnished. Very smooth interior. Diameter *c* 22cm. D. Form 4.
- 30 Fabric H (R8), grey, soft, with many lacunae on the exterior, which is orange-brown. Rim is slightly irregular, possibly deliberately so. Diameter *c* 30cm. E. Form 4.
- 31 Fabric H (R9), tempered with coarse sand and some vegetable material. Dark orange-brown exterior below shoulder; upper part and interior brown. C. Form 4.
- 32 Fabric H (R71), tempered with coarse sand and some vegetable material. Red-brown exterior below shoulder; C. Form 3. From the north section.
- 33 Fabric H (R3), variegated brown exterior. C. Form 12.
- 34 Fabric H (R8), dark brown exterior, dark grey interior, coarsely finished with large shallow finger impressions below the rim. D. Form 11.
- 35 Fabric H (R6), grey to orange-red exterior, brown interior. Diameter *c* 40cm. D. Form 3.
- 36 Fabric H (R3), brown surfaces, traces of burnishing on the exterior. D (large). Form 11.
- 37 Fabric H (R3), heavily tempered with coarse sand; dark brown exterior, dark grey interior. The exterior is decorated with scored lines, the rim is battered but retains a few finger nail impressions. D (large). Form 3.
- 38 Fabric H (R1), light brown exterior, dark brown interior. Possibly *c* 25 cm in diameter. C. Form 1. From the north section.
- 39 Fabric H (R11), coarse sand tempering, fired patchily brown externally. The interior is very rough and the exterior seems to have been deliberately striated. C. Form 8. From the north butt end.
- 40 Fabric H (R13), with dark to orange-brown patches on the surfaces. Vertical striation 2 mm deep on the exterior. E. Form 4. From the south butt end.
- 41 Fabric G (R7), with a trace of fine sand tempering; soft and abraded. The exterior is striated and fired orange-brown, the interior is light grey. C. From the south butt end.
- 42 Fabric H (R6), grey, with coarse double fingertip decoration on the rim. Diameter *c* 20cm. D. Form 1.
- 43 Fabric G (R9), fired orange-red externally below the shoulder. D. Form 1. From the south butt end.
- 44 Fabric G (R7), light brown exterior, dark brown to grey interior. Diameter possibly *c* 30cm. D. Form 1.
- 45 Fabric H (R14), dark brown exterior, light brownish-grey interior, probably burnt. Diameter *c* 28cm. E. Form 13. From the south butt end.
- 46 Fabric H (R7), light brown surfaces with a few lacunae. Diameter *c* 20-25 cm. E. Form 2.
- 47 Fabric G (R9), hard and dense, grey. D. Form 1.
- 48 Fabric G (R7), light brownish-grey exterior. Probably *c* 22 cm in diameter. D. Form 1.
- 49 Fabric (R51), dark brown interior. Diameter *c* 40cm. E. Form 9.
- 50 Fabric H (R7), brownish surface tinges. B. Form 2.
- 51 Fabric H (R71), coarse sand tempering, dark brown surfaces. Irregularly made vessel, *c* 10cm in diameter. D. Form 1. From the north butt end.
- 52 Fabric G (R7), very little tempering, orange-brown exterior on shoulder and neck. C. Form 3. From the north section.
- 53 Fabric G (R3), with vegetable tempering, dark brown exterior, orange-brown interior, eroded

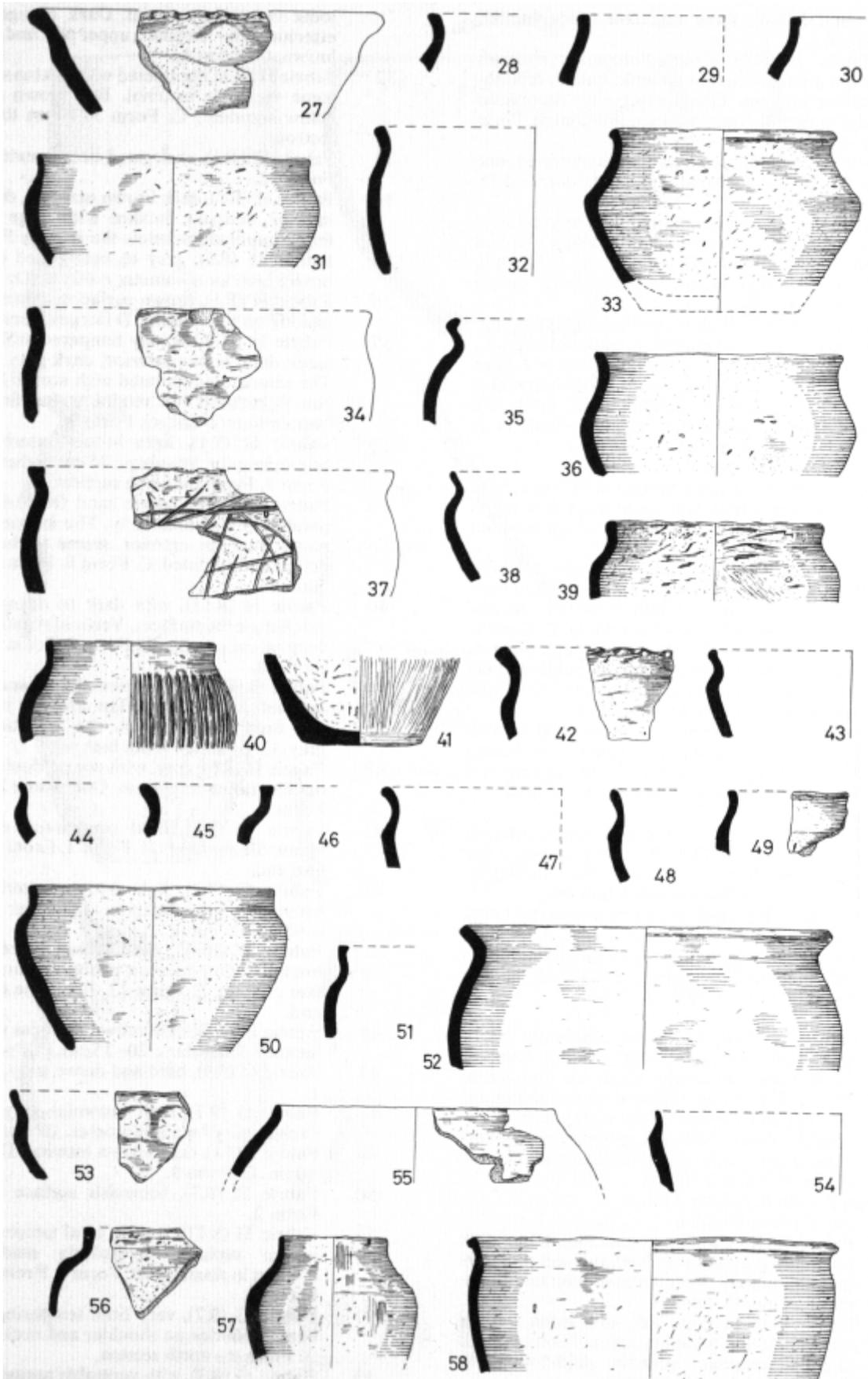


Fig 43 Little Waltham: pottery of Period II, 27-58, scale 1:4

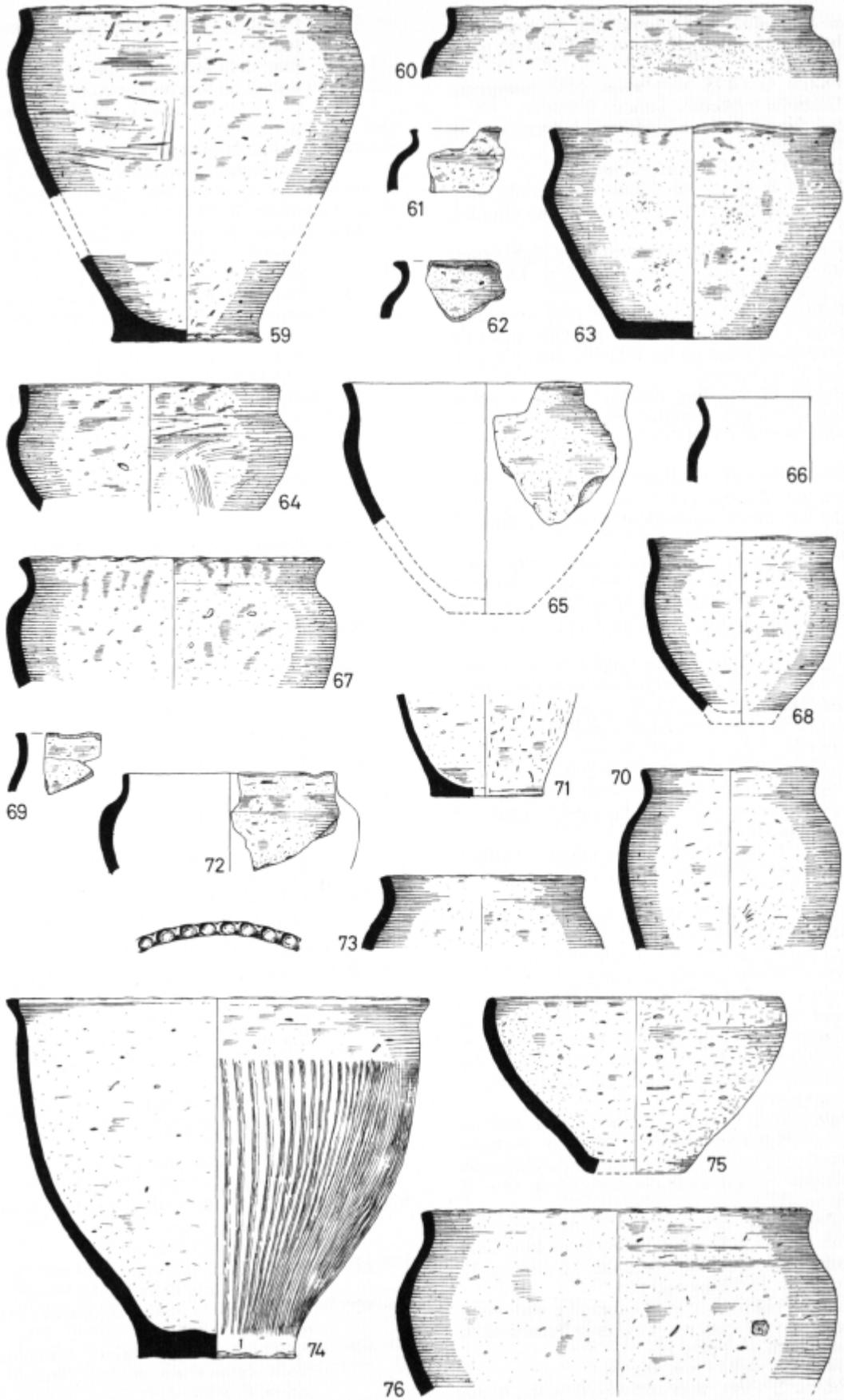


Fig 44 Little Waltham: pottery of Period II, 59-76, scale 1:4

- and abraded. Angle uncertain, diameter probably *c* 15-20 cm. E. Form 11. From the south butt end.
- 54 Fabric G (R7), with some sand tempering. Diameter *c* 24 cm. C (small). Form 1.
Not illustrated: form 1,5; form 2,1; form 3,3; form 9,1 (D); form 11,4; form 13.1.
- Hut C17, wall trench, section A*
- 55 Fabric H (R1), hard, finely tempered, micaceous, burnished surfaces somewhat abraded. D. Form 15C.
- 56 Fabric J (R8), with sand tempering, light brown surface patches on the exterior. Diameter *c* 22cm. E. Form 2.
- 57 Fabric H (R9), coarse texture, with some large grits. Light brown surface patches, and light vertical striation on the exterior, possibly accidental. C. Form 2.
- 58 Fabric G. showing lacunae on the surfaces below the rim. Exterior brown, interior dark grey to brown. C. Form 9.
- Fig 44
- 59 Fabric H (R10), reddish-brown exterior, brown interior. There is a slight undulation to the rim; the interior shows random smoothing lines. C. Form 1.
- 60 Fabric H (R1), with some large grits, hard, burnished on the shoulder and rim. C. Form 8.
- 61 Fabric H (R8), fine black to brown exterior, red to brown interior. Diameter *c* 15 cm. D. Form 1.
- 62 Fabric H (R5), brown, probably once burnished since traces survive on the interior of the rim. Diameter *c* 15-18 cm. E. Form 14.
- 63 Fabric H (R8), with some vegetable tempering; exterior light to dark brown with surface lacunae; interior eroded. C. Form 1.
- 64 Fabric H (R4), reddish-brown exterior, dark brown interior. The vessel is most irregular in shape and finish. C. Form 2.
- 65 Fabric H (R4), hard, brown exterior surface; burnished on the inside of the rim. E (large). Form 11.
- 66 Fabric H (R72), hard, burnished internally and probably once externally. C. Form 3.
Not illustrated: form 3.2; form 4,1 (D); form 11,1.
- Hut C17, wall trench, section B*
- 67 Fabric H (R4), heavily tempered with coarse sand including grits up to 10mm; dark to orange-brown exterior, dark brown-grey interior. Coarsely finished, with an irregular rim possibly attempting finger tip decoration. D (large). Form 1.
- 68 Fabric H (R3), with some large grits, and red grog fragments worked into the surfaces, mostly the exterior but not the rim. Light brown patches on the exterior, undulating rim. B. Form 11.
- 69 Fabric H (R72), soft, fine sand tempering; reddish-brown surfaces, possibly once burnished externally. Diameter perhaps 15-20 cm. D. Form 11. From the butt end.
- 70 Fabric H (R6), fine sand tempering with some vegetable material; probably once burnished on the outside. C. Form 11.
- Hut C17, wall trench, section C*
- 71 Fabric H (R4), with some large grits, brown exterior. D.
- 72 Fabric H (R14), brown patches externally. E. Form 2.
- 73 Fabric J (R7), fine flint tempering; reddish-brown patches on the exterior, brown interior. D. Form 11. Several sherds of similar vessels present.
- 74 Fabric H (R4), soft, with some large grits; red to reddish-brown exterior, mostly red interior. The rim is stabbed, and the body lightly furrowed. B. Form 6.
- 75 Fabric H (R9), with some grass tempering; exterior surface uneven, light brown except rim. Interior eroded. C. Form 15A.
- 76 Fabric H (R4), with many large grits and some coarsely crushed quartzite, patches of brown on exterior. Slight finger tip decoration on the rim. B. Form 11.
- Fig 45
- Hut C3, wall trench*
- 77 Fabric H (R4), light brown abraded exterior, orange-red interior. The rim has finger tip decoration, and the shoulder is ribbed as a result of this. C. Form 3. From the south butt end.
- 78 Fabric H (R15), fine sand tempering, dark grey to brown exterior, burnished interior. E. Form 5.
- 79 Fabric G (R6), brown exterior, dark brown interior. D. Form 1. From the south butt end.
- 80 Fabric H (R3), brownish exterior probably once burnished. C. Form 11.
- 81 Fabric J (R6), finely tempered, dark brown surfaces. Diameter *c* 15-18 cm. D. Form 9.
- 82 Fabric H (R4), red to brown exterior. D. Form 11.
- 83 Fabric H (R1), grey to brown exterior, dark grey interior; traces of burnishing on shoulder. C. Form 14. From the south butt end.
- 84 Fabric H (R1), dark brown to grey exterior possibly once burnished. C. Form 1. From the south butt end.
- 85 Fabric G (R7), very little tempering, buff to brown surfaces, abraded. C (small sherds). Form 13.
- 86 Fabric H (R51), with dark brown interior. The exterior retains traces of fine diagonal striation. C (non-joining). Form 11. From the south butt end.
- 87 Fabric H (R2), dark brown burnished exterior. Diameter *c* 15-20 cm. D. Form 1.
- 88 Fabric H (R8), finely sand-tempered; dark brown exterior, burnished surfaces. Diameter *c* 20-25 cm. E. Form 5. From the south butt end.
- 89 Fabric G (R4), light brown abraded exterior. The rim has slight finger tip decoration. E. Form 11.
- 90 Fabric H (R6), abraded, brown exterior. Diameter possibly *c* 30cm. E. Form 11.
- 91 Fabric H (R3), dark brown pitted exterior. Diameter *c* 30cm. E. Form 17B. Found in clearing within C3.
- 92 Fabric H (R3), coarse, brownish interior. Possibly *c* 30cm in diameter. E. Form 5.
- 93 Fabric H (R8), orange-brown exterior, orange-red interior. E. Form 13.
- 94 Fabric H (R10), coarse; orange-brown exterior, dark brown interior. Unusual rim decoration. C. Form 4.
- 95 Fabric H (R8), probably once burnished exter-

- nally; possibly 25-27 cm in diameter. D. Form 5.
- 96 Fabric H (R1), abraded and partly burnt red after breakage. E. Form 4. Found in clearing within C3.
- 97 Fabric H (R51), coarse sand tempering, dark brown exterior. Diameter probably *c* 25 cm. E. Form 4. From the south butt end.
- 98 Fabric G (R9), decorated with incised lines. E.
- 99 Fabric H (R5), decorated with incised lines, E.
- 100 Fabric H (R5), dark brown surfaces. Exterior decorated with incised lines. E.
- 101 Fabric G (R9), with some very fine sand. E. Possibly from the same vessel as 98.
- Not illustrated:* form 1, 2; form 3, 2 (1D): form 5, 1; form 9,1; form 11, 3.
- Hut C4, wall trench*
- 102 Fabric H (R4). E (large). Form 14.
- 103 Fabric H (R9), with vegetable tempering, surfaces various shades of brown. Rim decorated with finger impressions. C. Form 3.
- 104 Fabric H (R15), dark reddish-brown exterior, both surfaces burnished. D. Form 1.
- 105 Fabric H (R4), dark brown exterior. D. Form 10B.
- 106 Fabric H (R8), grey, burnt after breakage producing brown patches. Diameter *c* 20cm. E. Form 9.
- 107 Fabric H (R1), with vegetable tempering, burnt after breakage producing orange-buff patches. A small vessel. E. Form 5.
- Not illustrated:* form 1, 1; form 3, 3; form 5, 3; form 9, 2; form 11, 3.
- Hut C6, wall trench*
- 108 Fabric H (R14) brownish exterior. Diameter *c* 20-25 cm. D. Form 17B. From the south butt end.
- 109 Fabric H (R6), dark brown exterior. Diameter *c* 20.25cm. E. Form 3.
- 110 Fabric H (R4). coarse, brown surfaces; rim decorated with oblique finger tip impressions. Diameter *c* 30-35 cm. E (forked into fragments). Form 1.
- 111 Fabric H (R3). fairly soft, dark brown rough exterior with many lacunae; orange-red in interior. Oblique finger tip decoration on the rim. D. Form 9.
- 112 Fabric H (R6), very dark brown exterior, brown interior. Diameter *c* 17-19 cm. D.
- 113 Fabric H (R4), fine sand and some grog tempering, partly burnt light brown after breakage. Diameter *c* 25 cm. E. Form 3.
- 114 Fabric H (R8). dark red-brown surfaces. Diameter *c* 20-25 cm. E. Form 15A.
- 115 Fabric G (R6). micaceous, fine, dark grey. Nail impressions radially on rim. E. Form 4.
- 116 Fabric H (R5). Faint diagonal furrowing on top of rim. E. Form 4.
- 117 Fabric G (R6), brown surfaces. E. Form 5.
- 118 Fabric H (R51). very dark brown exterior. reddish-brown interior. E. Form 2.
- 119 Fabric H (R5), dark brown burnished exterior, grey interior. E. Form 1.
- 120 Fabric H (R6), dark brown exterior, reddish-brown interior. Vertical ridged decoration. E. Similar fragments from feature 255.
- 121 Fabric H (R4), fairly heavily tempered with coarse sand; burnt after breakage producing brownish patches. Brown interior. C (small). Form 2.
- Not illustrated:* form 9,1; form 13,1, in fabric A.
- Hut C7, wall trench*
- 122 Fabric H (R9), dark brown exterior with vegetable impressions. D. Form 13.
- 123 Fabric H (R7), with vegetable tempering; dark brown-grey exterior textured apparently by wiping, which has drawn grains from the tempering along the surface. Lightly impressed oblique finger tip decoration on the rim. D. Form 11.
- 124 Fabric A, with much more sand, of coarser grain (up to 1.5 mm) than is usual. The body is well burnished with vertical strokes externally and lightly burnished internally. The footing is clumsy and worn. C. Form 13.
- Fig 46
- 125 Fabric G (R9), with sand and a little grog tempering, coarse surfaces; dark reddish-brown exterior, brownish patches on the interior. B. Form 11.
- 126 Fabric H (R1), dark brown surfaces. D. Form 1.
- Not illustrated:* form 3,1; form 4,1; form 9,1.
- Hut C9, wall trench*
- 127 Fabric H (R5), brown surfaces. The rim has finger nail decoration and the body is decorated with scored vertical lines. C. Form 4.
- 128 Fabric J (R7), grey, heavily tempered with white flint grits. Brown exterior, buff interior. Decorated with (apparently vertical) reeding. E. Probably a sherd of a Deverel-Rimbury 'urn' (for a reeded example from Ardleigh, see Couchman 1975, fig 3.20 and pp 23-7).
- 129 Fabric H (R7), coarsely sand-tempered: exterior patchy brown, eroded; the interior retains traces of light burnishing. D. Form 16.
- Not illustrated:* form 11,1; form 13,1, in fabric A.
- Hut C10, wall trench*
- 130 Fabric H (R1), diameter *c* 20cm. E. Form 4.
- 131 Fabric H (R14), reddish-brown surfaces; exterior has oblique combing in patches on the shoulder. D. Form 17B.
- 132 Fabric H (R6), dark grey exterior. Diameter *c* 25 cm. E. Form 3.
- Not illustrated:* form 3,4; form 4,2; form 11,1.
- Hut C12, wall trench*
- 133 Fabric G (R6), with a little coarse sand; patchy brown exterior, brown-grey interior. C. Form 4.
- 134 Fabric H (R5), finely tempered; dark brown exterior, probably once burnished like the interior. D. Form 5.
- 135 Fabric H (R1), dark brown-black surfaces, burnished exterior. E. Form 5.
- Hut C13, wall trench*
- 136 Fabric G (R6), with a little fine sand tempering; dark brownish-grey exterior. D. Form 3.
- 137 Fabric G(R61), fine, hard: burnished exterior (some vegetable impressions show through) with reddish patches. C. Form 1.
- 138 Fabric H (R1), reddish-brown to dark grey exterior. reddish-brown interior. A large vessel. E. Form 11.
- 139 Fabric H (R1), dark brown exterior. It is possible that the top of the rim was decorated with a continuous narrow groove, but the surviving fragment is very small. Diameter *c* 15-17 cm. D. Form 4.

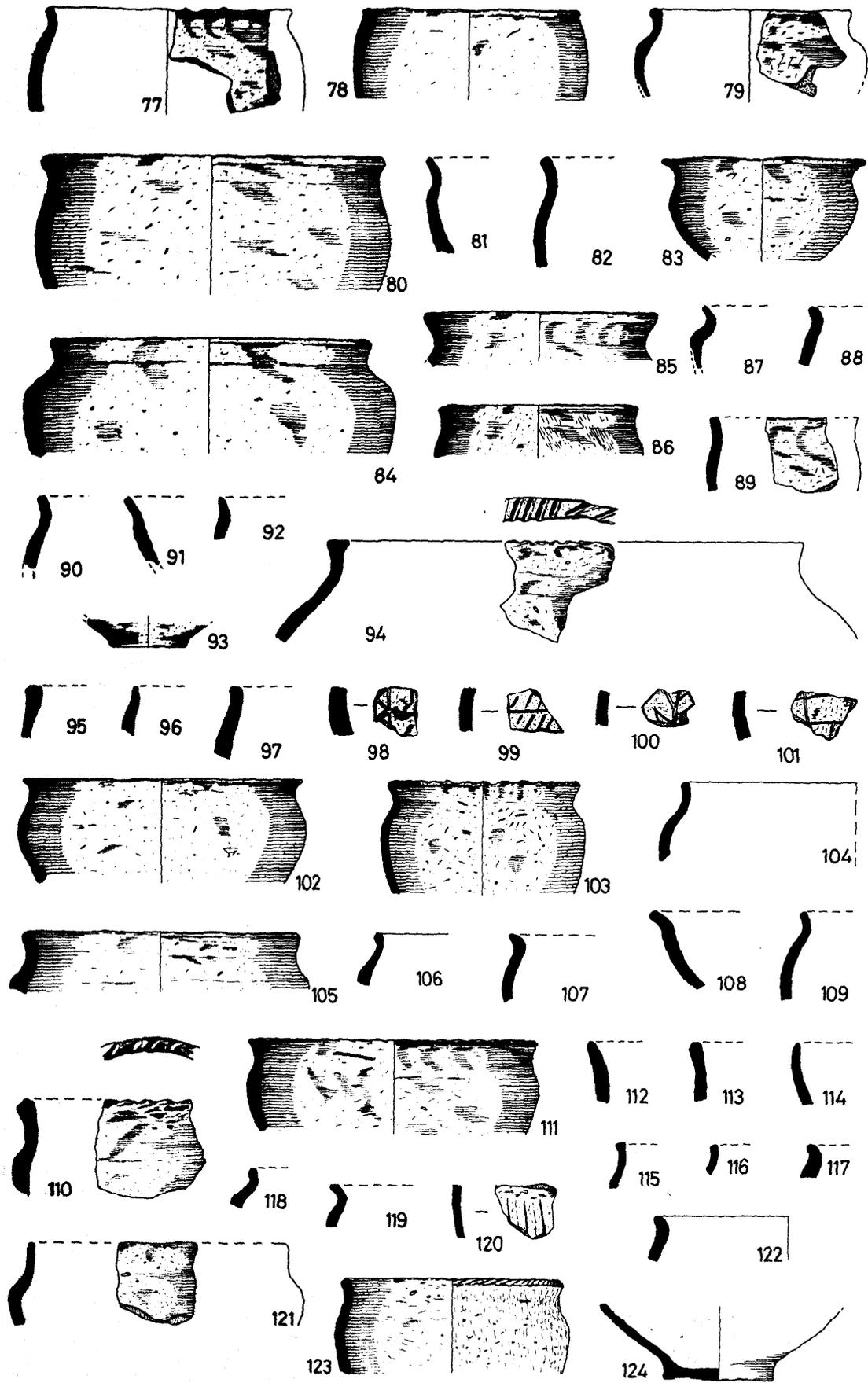


Fig 45 Little Waltham: pottery of Period II, 77-124, scale 1:4

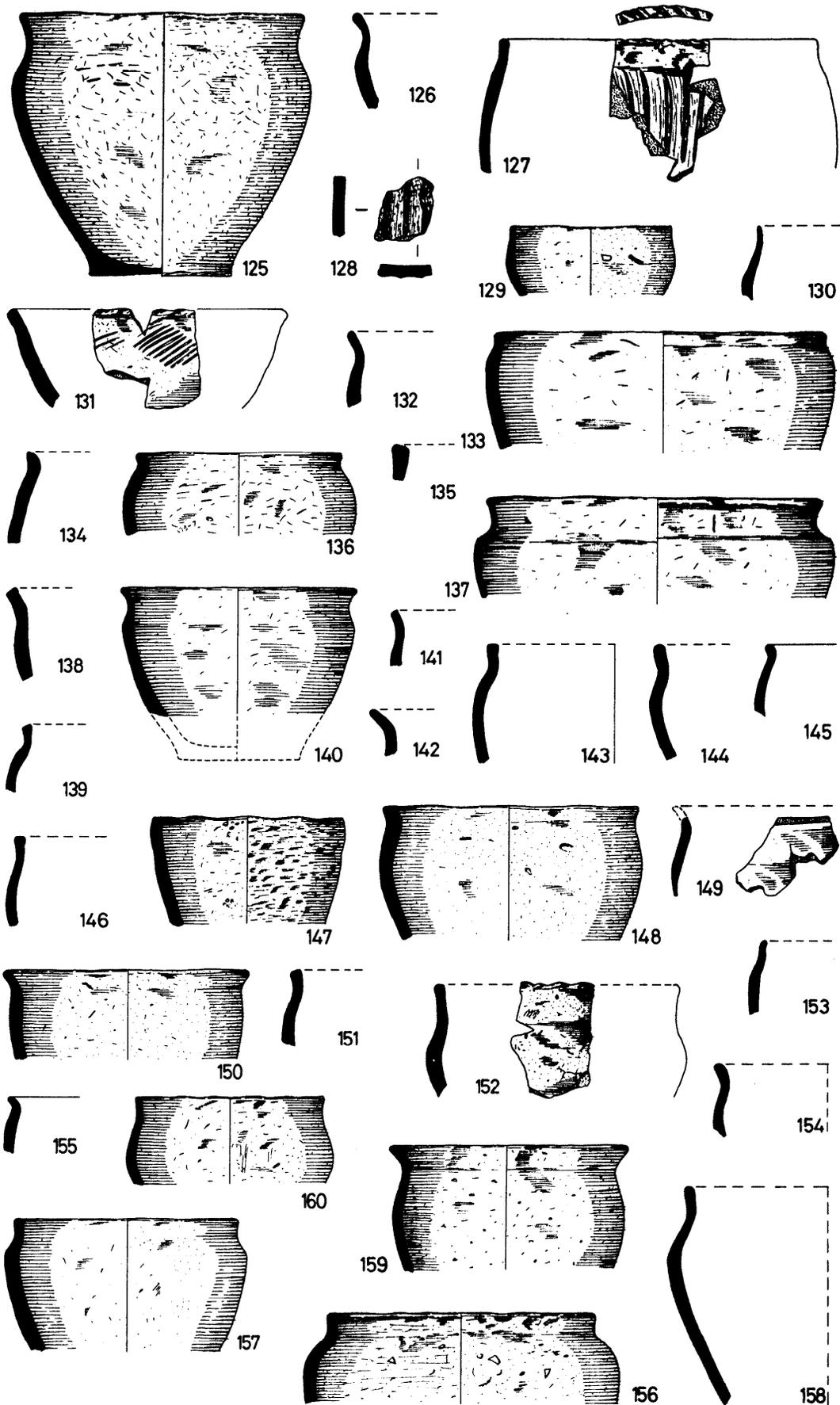


Fig 46 Little Waltham: pottery of Period II, 125-160, scale 1:4

- 140 Fabric H (R2), with fine sand and vegetable tempering, dark brown exterior. B. Form 9.
- 141 Fabric H (R12), brown exterior. E. Form 11.
- 142 Fabric H (R6), tempered with coarse sand; reddish-brown surfaces. Irregular finish, with slight oblique finger tip decoration on the rim. Diameter *c* 20-25cm. E. Form 3.
- 143 Fabric H (R71), traces of external burnishing on the shoulder. C. Form 4. From the southwest butt end.
- Not illustrated:* form 1,2; form 3,1.
- Hut C16, wall trench, phase B*
- 144 Fabric H (R9), with vegetable tempering, brown surfaces. Diameter *c* 15 cm. C. Form 3.
- Hut C16, wall trench, phase A*
- 145 Fabric G (R72), fairly soft but retaining traces of burnishing. Diameter probably *c* 10cm. E. Form 5.
- Hut C15, wall trench, section A*
- 146 Fabric H (R4), light brown patches on the exterior. There are traces of nail indentations on the rim, and there is a slight vertical emphasis on the exterior. Diameter probably *c* 10-12cm. D. Form 4.
- 147 Fabric H (R61), very coarsely finished, surfaces mostly orange-brown. C. Form 15B.
- Not illustrated:* form 3, 1.
- Hut C15, wall trench, section B*
- 148 Fabric H (R22), hard, with traces of external burnishing on the shoulder. D. Form 3.
- Hut C15, wall trench, section C*
- 149 Fabric A, finely burnished externally, coarsely burnished internally. The rim has been deliberately ground down in antiquity, presumably after damage. Diameter perhaps 20-25 cm. D. Form 13.
- Hut C18, wall trench*
- 150 Fabric H (R71), heavily sand-tempered, dark brown surfaces. C. Form 3.
- 151 Fabric H (R1), heavily sand-tempered, light brown surfaces. There is very slight oblique finger tip decoration on the rim. Diameter *c* 15 cm. E. Form 11. From the wall trench adjoining the west side of the south entrance.
- 152 Fabric H (R21), heavily tempered with coarse sand including some large grains. Surfaces have a brownish tinge. Slightly oblique finger tip decoration on rim. C. Form 4.
- Hut C18, secondary slot in east entrance*
- 153 Fabric H (R3), orange-red exterior, brown interior. Diameter *c* 20-22 cm. D. Form 4.
- Feature 53*
- 154 Fabric H (R21), with fine sand tempering; brownish exterior with traces of burnishing, lightly burnished interior. E. Form 13.
- Feature 59*
- 155 Fabric H (R5), heavily sand-tempered, bright orange probably as a result of secondary firing, which also seems to account for the soft surfaces and crazed exterior. Diameter *c* 15-18cm. E. Form 5.
- Not illustrated:* form 1, 1; form 3, 1.
- Feature 60*
- Not illustrated:* form 13, 1.
- Feature 74*
- 156 Fabric J (R21), tempered with sand and some large flint grits. Grey to brown rough exterior, black-brown interior with horizontal cutting marks. D. Form 2.
- Feature 76*
- 157 Fabric H (R22), hard, very fine sand tempering, with traces of intense black external burnishing. C. Form 8.
- 158 Fabric H (R4), friable, with vegetable tempering; reddish-brown to brown exterior, dark grey interior. C (badly crushed). Form 1.
- Feature 77*
- Not illustrated:* form 4, 1.
- Feature 78A*
- 159 Fabric H (R14), grey, with vegetable tempering, brown interior. Eroded, possibly due to firing after breakage. C. Form 13.
- Not illustrated:* form 8, 1.
- Feature 81*
- 160 Fabric H (R9), with vegetable tempering, reddish-brown exterior, dark brown interior; coarsely finished. C. Form 4.
- Not illustrated:* form 11, 1.
- Fig 47
- Feature 82*
- 161 Fabric H (R1), coarsely finished, particularly on the exterior. The rim is lightly and unevenly decorated with oblique finger tip impressions. D. Form 3.
- Not illustrated:* form 3, 2; form 9,1; form 11,3; form 13,1.
- Feature 87*
- Not illustrated:* form 3,1.
- Feature 96*
- 162 Fabric D; the subsurface is fired brown with a near-black, burnished exterior surface. The interior is less well burnished, horizontal lines being apparent; the colour is brownish. A single substantial flint fragment shows on the exterior surface. E. Form 13.
- Not illustrated:* form 11, 1.
- Feature 101*
- Not illustrated:* form 3, 1.
- Feature 127*
- 163 Fabric H (R4), brownish patches on the exterior. C. Form 3.
- Not illustrated:* form 11,2.
- Feature 141*
- Not illustrated:* form 1, 2 (1D); form 4, 1; form 11, 1.
- Feature 162, northern section, upper filling*
- 164 Fabric H (R4), tempered with coarse sand, reddish-brown exterior. brown-grey interior. Diameter perhaps *c* 20cm. D. Form 4.
- 165 Fabric H (R9), with vegetable tempering. The exterior is rough, eroded and fired dark brown. C. Form 3.
- 166 Fabric H (R1). heavily tempered with coarse sand; the exterior is light grey and abraded. C. Form 1.
- 167 Fabric H (R4), hard, exterior brown and possibly once burnished. D. Form 3.
- 168 Fabric G (R2), fine, very little tempering; brown to grey exterior probably once burnished; lightly burnished interior. E + fragments. Form 3.
- 169 Fabric D. E. Form 13, a footing base.
- Not illustrated:* form 1, 3 (1D); form 4,2 (D); form 5,3 (1D); form 8,1 ; form 9,4 (2D); form 11,6; form 13,13 (6D).
- Feature 163C*
- 170 Fabric H (R3), grey to reddish-brown exterior. The sherd has an applied vertical rib, whose adherence to the wall of the vessel is not perfect. The form of the vessel, which had an internal



Fig 47 Little Waltham: pottery of Period II, 161-185, scale 1:4

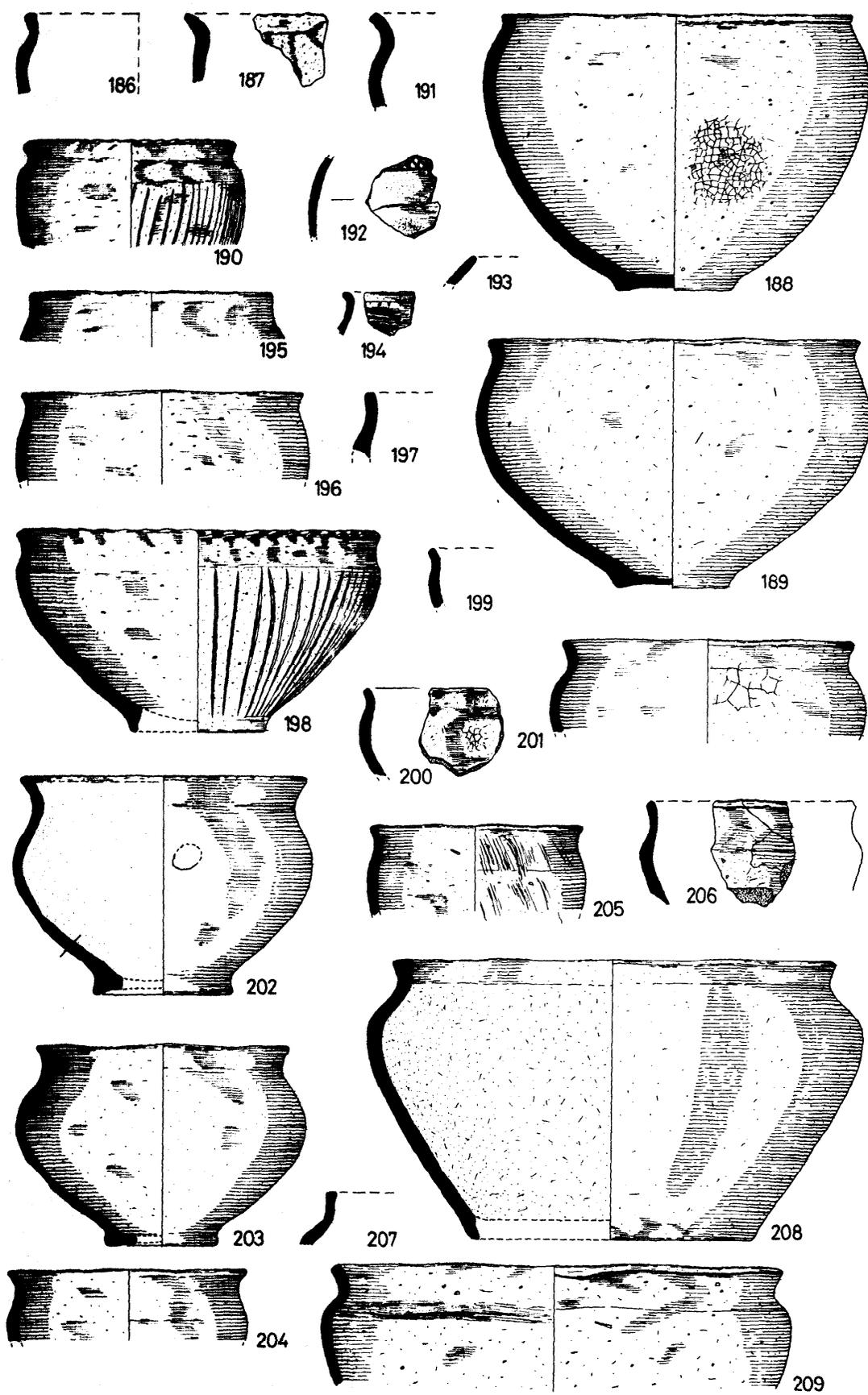


Fig 48 Little Waltham: pottery of Period II, 186-189; comparative vessel from Mucking, 190; pottery of Period III, 191-209, scale 1:4

- diameter of about 20cm, is quite unknown. E. No similar fragments were found.
- Feature 163A*
- 171 Fabric H (R15), burnt patchily brown after breakage. The exterior is abraded and was possibly once burnished; the interior is smooth. C. Form 5.
- 172 Fabric H (R8), dark brown exterior. The angular rim has very slight, irregular, oblique finger tip decoration. E. Form 2.
- 173 Fabric H (R3), brownish patches on the somewhat eroded exterior. C. Form 11.
- 174 Fabric H (R3), burnt orange after breakage. The tempering includes some grog. E. Form 4.
- Feature 163B*
- 175 Fabric H (R4), grey brown to dark grey exterior, brown to orange-red interior. There are traces of vertical striation on the exterior, below the well-marked shoulder line. Possibly intended for use with a lid. D. Form 9.
- Not illustrated*, F163: form 3,2; form 5,1; form 8,1; form 9, 1 (D); form 11,2; form 13,1 in fabric A from 163A.
- Feature 168*
- 176 Fabric H (R14), reddish-brown exterior, now abraded except on the rim and shoulder which are burnished. The jar was complete when buried, the rim being damaged in excavation. A. Form 12.
- Feature 175*
- 177 Fabric H (R6), heavily sand-tempered, burnished externally on the upper part and rim. An unusual variant of form 12, possibly approaching the base where broken. C.
- Feature 177*
- Not illustrated*: form 9,1 (C); form 11,1 (D).
- Feature 186*
- 178 Fabric G (R6), light grey-brown exterior. D (non-joining). Form 1.
- Not illustrated*: form 9, 1.
- Feature 197*
- 179 Fabric H (R61), with sand and vegetable tempering: reddish-brown patches on the eroded exterior. The base is complete to the level illustrated and may have been used in this form in antiquity. E.
- 180 Fabric H (R1), dark brown exterior, lightly burnished interior. C. Form 4.
- Not illustrated* (from 197B): form 4,1; form 13,2 (1D).
- Feature 208B*
- 181 Fabric H (R9), with vegetable tempering, light to dark brown surfaces, highly burnished externally on the shoulder. C. Form 3.
- 182 Fabric H (R9), with vegetable tempering, burnt orange-red after breakage. There are slight nail impressions on the top of the rim. C. Form 4.
- 183 Fabric H (R4), the exterior reddish-brown, flaking, probably once burnished: the interior dark brown. B. Form 1.
- Not illustrated*: form 11,1 (D).
- Feature 209*
- Not illustrated*: form 3,1.
- Feature 222*
- 184 Fabric J (R2), with coarse sand tempering: dark grey surfaces, brown subsurface. C. Form 3.
- Feature 231*
- 185 Fabric H (R8), dark grey to dark brown exterior. There is slight oblique finger tip decoration on the rim. D. Form 15B.
- Fig 48
- 186 Fabric H (R12), tempered with coarse sand and some vegetable material. The exterior is dark brown, very rough, with a slight vertical emphasis. The interior is reddish to dark brown. C (fragmentary). Form 3.
- 187 Fabric H (R3), with rough brown surfaces. D. Form 5.
- Feature 246*
- 188 Fabric H (R1), coarse, dark grey exterior, partly crazed by heat; red interior. A. Form 5.
- 189 Fabric H (R4), coarse, dark grey, with dark reddish-grey surfaces slightly crazed by burning after breakage. C. Form 5.
- Not illustrated*: form 5,1.
- MUCKING*, for comparison:
- 190 Hard orange-brown fabric with very fine sand tempering. The body is decorated with vertical scored lines. From the wall trench of a circular hut at 1027 × 145: level 1.
- PERIOD III
- Hut C1, encircling gully*
- 191 Fabric H (R4), tempered with coarse sand. Dark brown exterior, eroded and probably burnt; the interior is black and retains traces of burnishing. E. Form 1. From the north section, layer 1.
- 192 Fabric B. The surfaces have been burnished, the outer to a better standard than the inner; the sherd is now somewhat worn and abraded. The exterior is decorated with cross-hatching above a horizontal line, all executed in very shallow relief with a blunt tool. From the south butt end, layer 1.
- 193 Fabric H (R51), hard, dark brown, with fine sand tempering, burnished externally. E. Form 15B. From the south butt end, layer 2.
- 194 Hard dark grey-brown fabric with a few white angular grits. The surfaces tend towards a brown colour, and the exterior has a finely but irregularly striated finish. An unusual sherd, possibly belonging to an earlier prehistoric period. E. From the north section, layer 2.
- 195 Fabric H (R15), dark brown-red exterior, which is somewhat eroded though it retains traces of burnishing: the interior is burnished black. D. Form 4. From the north section, layer 1.
- 196 Fabric H (R3), hard, with fine sand and some vegetable tempering. The rim and shoulder are burnished, the remainder of the exterior, brownish in colour, is abraded; the interior is lightly burnished. E. Form 8. From the north butt end, layer 3.
- 197 Fabric H (R5), heavily sand-tempered, brownish-red surfaces. E. Form 11. From the north butt end, layer 3.
- 198 Fabric H (R9), heavily tempered with coarse sand, surfaces mostly orange-red. The rim is coarsely decorated with finger impressions and the body with vertical scoring. B. Form 9. From the north section, layers 1 and 2.
- 199 Fabric H (R5), hard, colour tends to buff externally on the rim. E. Form 11. From the north section, layer 3.
- 200 Fabric H (R5), dark grey-brown, tempered with coarse sand and vegetable material. Surfaces irregular, grey to orange-red. E. Form 11. From the north butt end, layer 3.

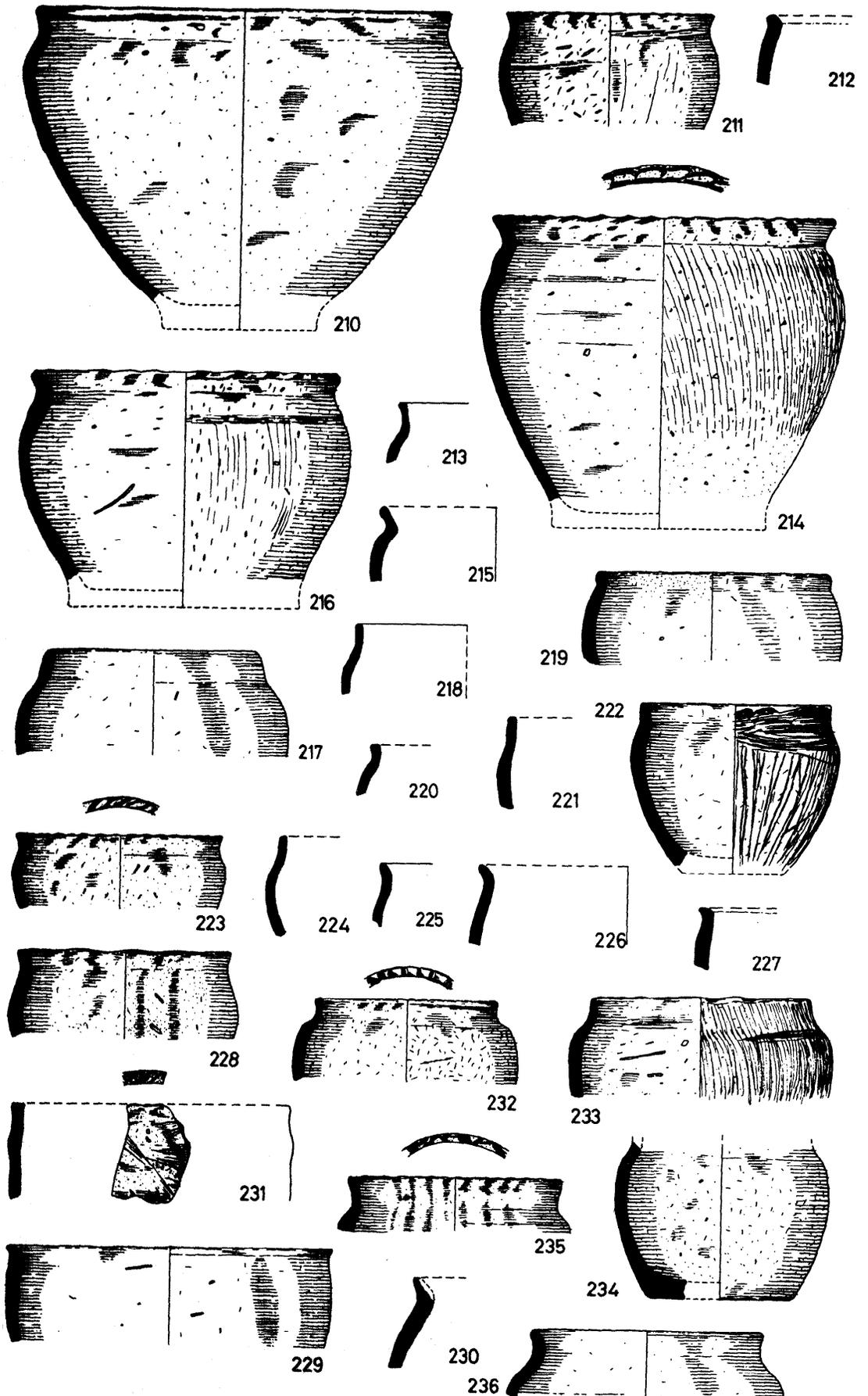


Fig 49 Little Waltham: pottery of Period III, 210-236, scale 1:4

- 201 Fabric H (R4), tempered with much coarse sand. The exterior is burnt, crazed and eroded; the interior is black to brown and burnished. D. Form 13. From the south butt end, layer 2.
- 202 Fabric A, very hard and finely burnished externally, lightly burnished, and showing horizontal tooling lines internally. A hole has been bored in the side after firing. B. The base is from a second vessel in the same fabric. Form 13. From the north butt end, layers 1, 2, and 3.
- 203 Fabric H (R4), finely tempered; exterior grey/brown/red, eroded. Both surfaces are burnished, the interior less thoroughly than the exterior. Some sherds have been burnt and discoloured after breakage. B. Form 13. From the north section, layers 1 and 2.
- 204 Fabric H (R5), fine, exterior burnished, brownish surfaces. C. Form 14. From the south butt end, layer 2, plus a few sherds from layer 3.
- 205 Fabric H (R5), dark brown to grey, fairly soft, tempered with coarse sand. The surfaces are brownish; there are traces of vertical striation externally. C. Form 11. From the north section, layer 3.
- Hut C2, encircling gully*
- 206 Fabric H (R2), finely tempered. The shoulder and rim have been smoothed externally; the sherd is cracked. E. Form 2. From the south butt end, recovered during the excavation of the sewer trench, 1970.
- 207 Fabric G (R2), grey, burnished surfaces. Diameter *c* 20cm. D. Form 2. From layer 2.
- 208 Fabric J (R4), hard, dark brown, heavily tempered with finely crushed calcined flint; some vegetable impressions are present particularly on the interior. The exterior and rim are burnished. B. Form 1. From layers 2 and 3.
- 209 Fabric H (R9), tempered with coarse sand; the exterior tends to a brownish colour and shows traces of burnishing. The vessel is poorly formed. C. Form 1. From layer 3.
- Fig 49
- 210 Fabric H (R3), with coarse sand tempering, friable, exterior bright orange-red below shoulder, the latter retaining traces of burnishing; there are some vegetable impressions below. B. Form 1. From the sewer trench.
- 211 Fabric H (R7), tempered with fine sand and probably some vegetable material; many vegetable impressions internally. The exterior is brownish: the slightly everted rim is flattened on top and very lightly finger-impressed. C. Form 3. From layer 3.
- 212 Fabric H (R4), fine, with traces of burnishing on rim and interior. Angle uncertain, diameter *c* 20-25 cm. D. Form 3. From layer 2.
- 213 Fabric H (R2), finely tempered, burnished externally. Diameter *c* 15-18cm. E. Form 3. From the north butt end, layer 1.
- 214 Fabric J (R2), hard, with flint grits up to 4mm. The exterior surface has been 'wiped' to produce fine, near-vertical striations, and is orange-brown to dark brown in colour; both surfaces have a few vegetable impressions. The rim is pointed and has oblique finger tip decoration on the inside: there is a slight cordon on the shoulder. C. Form 3. From layers 2 and 4, in the north and south butt ends.
- 215 Fabric H (R1), with traces of burnishing externally and on the rim, which was possibly intended to take a lid. D. Form 3. From layer 3.
- 216 Fabric H (R72), containing a few large grains; there are slight signs of vertical wiping and vegetable impressions on the exterior, which is dark reddish-brown in colour. The interior is dark brown. The rim is square and has very slight finger tip decoration. C. Form 3. From north butt end, layers 2 and 3.
- 217 Fabric H (R4), grey, fine, burnished black internally and externally, the latter to a better standard. D. Form 4. From layer 2.
- 218 Fabric H, fine sand and some vegetable tempering. The exterior is abraded but retains traces of burnishing; the interior is coarser. Diameter 16-20cm. E. Form 4. From layer 2.
- 219 Fabric H (R72), surfaces burnished, exterior tends to brown colour on rim, the inside of which is abraded. A few vegetable impressions show through the burnishing. E. Form 4. From layer 3.
- 220 Fabric H (R9), surfaces brownish. The interior has horizontal striation which may be deliberate. Diameter *c* 10-14 cm. E. Form 4. From layer 2.
- 221 Fabric G (R2), including fine sand. The exterior is light to dark brown, with traces of burnishing; the interior is burnished. Diameter *c* 12-16cm. E. Form 4. From layer 3.
- 222 Fabric H (R21), brownish grey with vegetable, grog, and some fine sand tempering. The exterior is fired dark brown on the rim and shoulder, becoming orange-red towards the base. It is decorated with irregular horizontal striations on the rim and shoulder, up to 1 mm deep but usually less; below the shoulder the decoration consists of vertical scoring, somewhat irregular though the lines are well separated; it is possible that pairs of lines *c* 3 mm apart were scored simultaneously. The rim and interior are smooth, though somewhat abraded; the surface shows vegetable impressions and is brown to grey in colour. B. Form 4. From layers 1, 2, and 3.
- 223 Fabric H (R72), grey, heavily sand-tempered; reddish-brown patches externally. There is oblique finger tip decoration on the flattened rim. D. Form 4. From layer 2.
- 224 Fabric G (R7), grey, with some fine sand tempering. The surfaces are abraded but the interior retains traces of burnishing. Diameter *c* 18-22cm. E. Form 4.
- 225 Fabric H (R21), friable, light brown surfaces; the exterior is burnished, the interior fairly rough. Diameter *c* 12-16 cm. D. Form 5. From the north butt end, layer 1.
- 226 Fabric H (R72), with a few grains up to 3 mm. The exterior is light brown, once burnished. E. Form 5. From layer 3.
- 227 Fabric H (R5), traces of burnishing on the rim and dark brown exterior, well burnished black internally. E. Form 5. From layer 2.
- 228 Fabric H (R72), coarse and fairly soft: brown exterior, light brown patches caused by burning after breakage. Slight vertical ridging discernable on the exterior. E. Form 5. From layer 3.
- 229 Fabric H (R7), light brown patch and traces of burnishing on an abraded exterior; well burnished internally. D. Form 5. From layer 2.

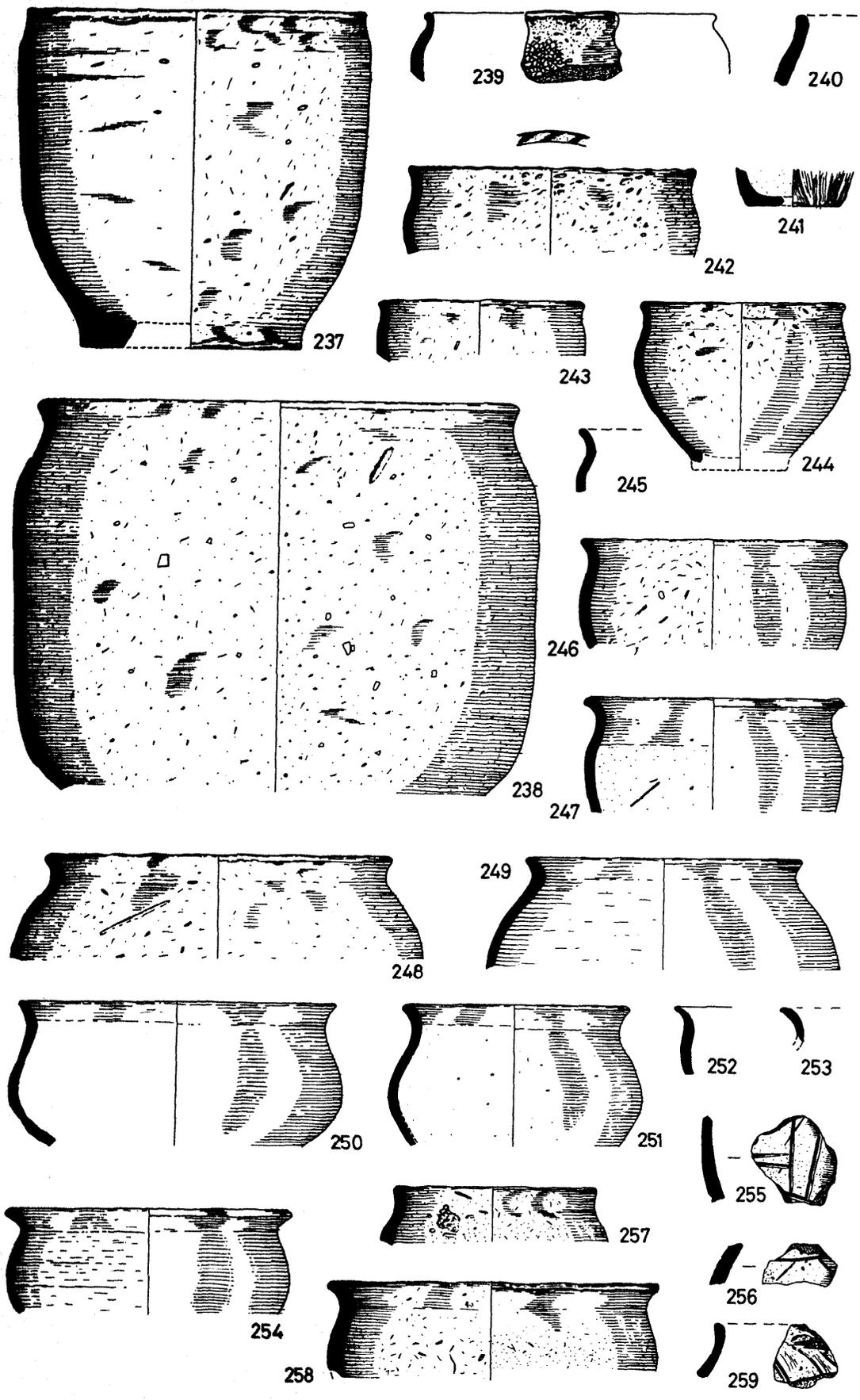


Fig 50 Little Waltham: pottery of Period III, 237-259, scale 1:4

- 230 Fabric H (R4), dark brown, friable, heavily tempered with coarse sand including particles up to 3 mm. The exterior is burnished, deep red in colour tending to black towards the rim; the interior is finely burnished. The red exterior layer is a constant 0.5 mm thick but does not seem to be a coating. This is the rim of a bowl of large diameter, perhaps more than 40cm. C. Form 5. From layer 4.
- 231 Fabric H (R9), light to dark brown exterior with apparently random ? knife cuts producing a 'rusticated' effect, and slight corrugations possibly indicating coil construction. Rim decorated with oblique finger tip impressions. E. Form 7. From layer 3.
- 232 Fabric G (R9), with grog tempering, very low density; exterior buff to orange-brown with slight vertical striations, interior dark grey to brown. The rim is decorated with thumb nail impressions. D. Form 8. From layer 2.
- 233 Fabric H (R1), with a few large grains. The surfaces are very rough and the rim is irregular, the exterior being 'wiped' perhaps with a coarse-grained cloth to produce a striated texture. There are traces of a similar treatment on the inside of the shoulder. Surface colouring varies from orange-brown to dark grey. C. Form 8. From layer 1.
- 234 Fabric H (R9), orange-brown exterior. Friable and badly eroded; possibly burnt. C. Form 8. From layer 2.
- 235 Fabric H (R8), including grains up to 3mm. Coarsely finished, distinct vertical ridging being visible on the interior (partly fired red) and to a lesser extent on the exterior. The flat top of the rim is decorated with oblique nail impressions. D. Form 10B. From layer 3.
- 236 Fabric G (R3), dark grey, tempered with brick-red grog, barely visible on the surfaces, which were both probably once burnished, though traces of a good black lustre survive only on the exterior, below the shoulder. C. Form 10B. From layer 3.
- Fig 50
237 Fabric H (R4), with coarse grains up to 4mm. and fine brick-red grog. Pinkish-buff to reddish-brown exterior, dark grey interior. The surfaces are soft, with a few vegetable impressions; the exterior is flaking. Striking differences in colour across the breaks suggest burning after breakage. B. Form 10A. From the north butt end, layers 1 and 2.
- 238 Fabric J (R9), the flint in particles up to 9mm, and containing much sand tempering. The fabric is soft and eroded, the original surfaces showing vegetable impressions; orange to orange-brown exterior. B. Form 10B. From layers 1, 2, 3, and 4.
- 239 Fabric H (R9), dark brown exterior, burnt after breakage and thus crazed. E. Form 10B. From layer 3.
- 240 Fabric H (R4), fine tempering; well burnished internally and on the rim, but traces only survive on the abraded exterior. Large diameter. E. Form 11. From layer 3.
- 241 Fabric H (R8), light brown interior. The exterior has vertical striations similar to those on the upper part of 222. D. From layer 3.
- 242 Fabric H (R8), with some poorly distributed vegetable material. The surfaces are generally soft, red or reddish-brown, with many lacunae in some areas where the vegetable matter has burnt out. The rim is decorated with light oblique finger impressions. C. Form 11. From layer 1.
- 243 Fabric G (R14), grey, fine, with some fine sand tempering; traces of burnishing on exterior and rim. D. Form 11. From layer 3.
- 244 Fabric H (R8), some vegetable tempering, which shows through the burnished surfaces, which are now partly abraded; the upper part is brownish. A. Form 11. From layers 1 and 3.
- 245 Fabric H (R8); the interior is rough, the surfaces show vegetable impressions, the rim is irregular. Diameter *c* 15-20cm. E. Form 13. From layer 2.
- 246 Fabric H (R14), with a few grains up to 5 mm. Exterior burnished, now partly abraded, many vegetable impressions internally. E (large). Form 13. From layer 3.
- 247 Fabric H (R4), dark brown with a few grains up to 2mm; dark brown finish externally, burnished on shoulder and rim and probably once below, although this is now abraded. The interior is burnished black. C. Form 13. From the north butt end, layer 2.
- 248 Fabric H (R9), coarse sand tempering; many vegetable impressions on interior, few on exterior, which is abraded and tends to a brownish colour. E (large). Form 13. From the north butt end, layer 2.
- 249 Fabric A (or very close); hard, burnished externally, and less finely on the interior. D. Form 13. From layer 1.
- 250 Fabric A, well burnished externally, coarser finish internally. C. Form 13. From north butt end, layer 2.
- 251 Fabric D, finely burnished black exterior, brown sub-surface. The interior is greyish, with a coarser burnished finish, individual horizontal strokes being discernible. C. Form 13. From the north butt end, layers 1 and 2 (possibly fragments of two vessels).
- 252 Fabric G (R7), grey, heavily abraded. Diameter *c* 16-20cm. E. Form 13. From layers 1 and 2.
- 253 Fabric B, somewhat eroded. The sherd is too small to ascertain the diameter. Possibly part of the same vessel as no 192. E. Form 13. From layer 3.
- 254 Fabric A, burnished to a fine polish externally, the strokes being horizontal above the widest point and vertical below. Coarse burnishing internally below the neck. C. Form 13. From layer 2.
- 255 Fabric J (R1), similar to no 238. The exterior is bright red, and is decorated with incised lines. E. From layer 1.
- 256 Fabric H (R1), tempered with coarse sand. The surfaces are greyish-brown, the exterior being decorated with lines incised *c* 1 mm into the fabric. E. From the north butt end, layer 2.

Not illustrated: form 1,3 (1C, 1D); form 2,4; form 3,2; form 4,7; form 5,3; form 8,1; form 11,1; form 13,3 (1 in fabric A). At least 200 vessels are represented by the illustrated and listed material, together with rim fragments too small to classify.

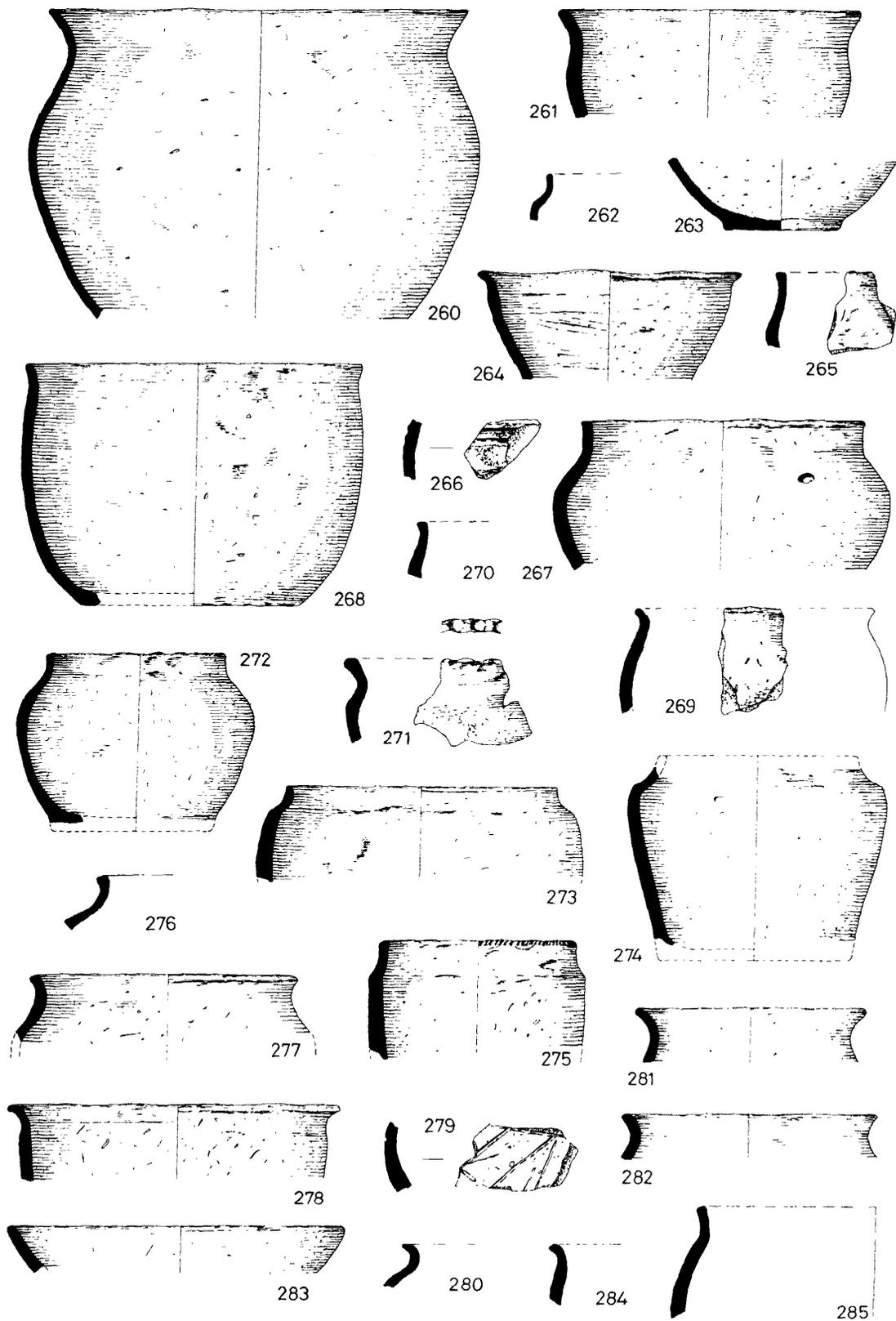


Fig 51 Little Waltham: pottery of Period III, 260-285, scale 1:4

- 257 *Feature 1*
Fabric H (R9), dark brownish-grey; interior eroded. D (non-joining). Form 11.
- 258 *Feature 7*
Fabric H (R9), fine. The exterior is slightly abraded and partially fired brown; the shoulder and rim are burnished and the interior lightly burnished. D. Form 13.
- 259 Fabric H (R9), dark brown exterior, reddish-brown interior. The sherd is abraded, thus the angle is most uncertain. The exterior is decorated with oblique scored lines. E. Form 11.
- Not illustrated:* form 4,1.
Fig 51 *Feature 2*
- 260 Fabric H (R2), fairly soft, tempered with fine sand; reddish-brown exterior, abraded surfaces. C. Form 11.
- Not illustrated:* form 4,1.
Feature 8
- Not illustrated:* form 1,1.
Feature 9
- Nor illustrated:* form 4,1.
Feature 16
- 261 Fabric C. the sole example. The exterior looks highly burnished and the interior below the rim is rough. C. Form 11.
- Feature 38*
- 262 Fabric H (R9), tempered with coarse sand; dark brown surfaces. slightly flaked interior. Diameter *c* 20cm. D. Form 8.
- Feature 41*
- 263 Fabric J (R3), with some sand tempering. The exterior is orange-brown to dark brown, abraded. Large vessel. C.
- Feature 48*
- Not illustrated:* form 3,1.
Feature 50
- 264 Fabric H (R3), coarsely formed vessel with dark brown to grey exterior, brownish-red interior. The latter shows signs of coil construction. D. Form 17A.
- Feature 253: enclosing palisade*
- 265 Fabric H (R5), with irregular, heavily flaked, brown surfaces. The sherd is very abraded. E. Form 11. From layer 3.
- Horseshoe enclosures: Feature 225*
- 266 Fabric E, low density, light grey with many dark grey flecks. The exterior is dark grey on brown, the interior brown. Decoration consists of two narrow cordons; the exterior, now mostly eroded, was clearly once burnished. E. Form 18D.
- 267 Fabric H (R3), dark brown exterior, brown interior, vegetable impressions in the surfaces. C. Form 2.
- 268 Fabric H (R7), including grains up to 3 mm and some vegetable material. The exterior is generally orange-red, the interior dark grey. A. Form 3.
- 269 Fabric H (R4), hard, light to dark brown exterior, surfaces have vegetable impressions. The flattened interior of the rim may suggest the use of a lid. D. Form 3.
- 270 Fabric H (R9), with fine sand tempering; dark greyish-brown surfaces. The rim is uneven. Diameter *c* 25-30cm. D. Form 4.
- 271 Fabric H (R6), heavily burnt exterior, brownish patches internally. Frilled rim; diameter possibly *c* 30-35 cm. D. Form 1. Probably derived from hut C6.
- 272 Fabric G (R7), fairly soft, with some fine sand tempering. The exterior, though abraded, retains slight traces of fine vertical emphasis, and the rim is lightly decorated with finger nail impressions on the top edge. The colour is variegated black and red. B. Form 4.
- 273 Fabric H (R4), hard, lightly burnished externally. E. (large). Form 8.
- 274 Fabric H (R2), hard, brown exterior below shoulder. The upper part is burnished externally and the interior is very smooth, probably lightly burnished. D. Form 8.
- 275 Fabric H (R9), with vegetable tempering; the surfaces are brownish-grey, and coarsely finished. The slightly beaded rim is decorated with finger nail impressions. D. Form 8.
- 276 Fabric H (R2), light brown surfaces. Diameter *c* 15-20cm. C. Form 12.
- 277 Fabric H (R3), hard, coarse; dark grey surfaces, lightly burnished externally and on rim. D. Form 10B. The lower part of the profile is inferred from a similar example, unburnished and with a brownish exterior.
- 278 Fabric H (R3) as no 270; grey to brown surfaces heavily marked with vegetable impressions. E (large). Form 17A.
- 279 Fabric J (R3), hard, tempering includes coarse sand. The exterior is dark brown, decorated with lines incised with a relatively blunt instrument to a depth of 1-1.5 mm. The interior is brownish and both surfaces show some vegetable impressions. The sherd seems to be a part of a large jar. D.
- 280 Fabric H (R9), coarse, fired red externally. Very slight indications of finger tip decoration on the rim. Diameter *c* 20 cm. E. Form 12.
- Not illustrated:* form 2,1; form 3,2; form 4,3; form 8,2; form 10A,1; form 11,1; form 13,2.
Feature 256
- 281 Fabric A; heavily burnt, brown eroded exterior. D. Form 13.
- 282 Fabric A; burnished as no 254. D. Form 13.
- 283 Fabric H (R6), mostly brown surfaces, traces of external burnishing. D. Form 17B.
- 284 Fabric H (R3), with fine sand and vegetable tempering; dark grey-brown surfaces. Diameter *c* 15-20cm. C. Form 5.
- 285 Fabric H (R6), soft, dark grey with coarse sand and some vegetable tempering, the latter showing mostly on the interior. C (many non-joining sherds present). Diameter approximate. Form 3
- Fig 52
286 Fabric E, light greyish-brown, rather granular, with dark grey flecks; the surfaces are medium brown with some small lacunae. The vessel is of 'early Belgic' type: 10 sherds were found, including several of the middle section, though these could not be placed accurately on the drawing. C. Form 18.
- 287 Fabric J (R3), heavily tempered with fine flint grit: the surfaces tend to brown. Possibly once burnished on the shoulder and rim. C. Form 9.
- Not illustrated:* Form 4,2; form 12,1 (burnt and abraded, probably residual); 'Belgic sherd', fabric similar to no 286, 7-9 mm thick, from upper layer.

- 288 *Feature 257*
Fabric H (R4), brown exterior, Diameter *c* 20cm. D. Form 8.
- 289 Fabric G (R2), with a little sand tempering; much abraded, though traces of dark brown surfaces remain. D. Form 9.
- 290 Fabric H (R3), with vegetable impressions in the brownish-grey surfaces. C. Form 13.
Not illustrated: form 5,2; form 9,1; form 10B,2.
- 291 *Feature 263*
Fabric H (R6), orange-brown to grey exterior with vegetable impressions. The rim is decorated with oblique finger nail impressions. E. Form 9.
- 292 Fabric H (R72). heavily sand-tempered, traces of burnishing on the shoulder and rim. D. Form 1.
Not illustrated: form 3,2; form 4,1; form 5,1; form 11,1.
- PERIOD IV
- 293 *Hut C5, wall trench*
Fabric H (R4), dark brown exterior with traces of burnishing on the shoulder. D. Form 11.
- 294 Fabric H (R71), reddish to dark brown exterior. C. Form 6. From the north butt end.
- 295 Fabric E, grey, granular, with dark grey flecks, contains some grog and sand tempering; dark reddish-brown surfaces. E. Form 18. Very similar to no 286.
- 296 Fabric H, (R7), brown coarse exterior with lacunae. D. Form 7. From the north butt end.
- 297 Fabric H (R 13), light grey-brown exterior. E. Form 3.
- 298 Fabric H (R5), light brown-grey surfaces. D. Form 11.
Not illustrated: form 1,1; form 3,1; form 5,1; form 9,1 (D); form 11,4.
- 299 *Feature 130*
Fabric H (R10), orange-red to dark brown exterior, orange interior. The irregular rim is lightly decorated with oblique finger tip decoration. C. Form 9.
- 300 Fabric H (R4) as no 299, the interior being somewhat darker. The lower part of the vessel is decorated with coarse oblique incised lines, against a very sandy background. The central section is smooth, dark grey, and is decorated with lightly incised, irregularly spaced, vertical lines. The 'Belgic' undertones are clear. C. Form 18.
Not illustrated: form 3,2 (1 D); form 9,1 (D).
- 301 *Feature 165*
Fabric E, grey-brown, granular, with a 'soapy' feel. The exterior is brown, the rim and shoulder retaining traces of burnishing; the interior is mostly grey and slightly flecked. The body is decorated with rows of holes made by a blunt, tapered instrument; they penetrate approximately half the thickness of the wall. A large section of the irregular rim survives but only a small part of the decoration, thus the pattern is obscure. Probably hand-made. C. Form 18.
- 302 Fabric H (R72), with fine sand and vegetable tempering; the exterior is dark brown and retains traces of burnishing. D. Form 3.
- 303 Fabric H (R3), with vegetable tempering; brown to orange-red surfaces. The body is decorated with lightly incised vertical scoring, in which some lines are paired. C. Form 3.
- 304 Fabric H (R3), orange-brown exterior becoming dark brown on the shoulder and rim; dark brown to grey interior. The exterior is flaking in places. C. Form 3.
- 305 Fabric H (R8), brownish exterior, burnished interior. D. Form 7.
Not illustrated: form 3,3; form 4,3; form 11,4.
- 306 *Feature 171*
Fabric H (R1), brownish-grey exterior. The rim of a large storage jar, possibly *c* 30 cm in diameter; badly flaked, the thickness being restored from other fragments. C. Form 4.
Not illustrated: form 11,1 (D).
- 307 *Feature 173*
Fabric H (R4), hard, tempered with fine sand, dark brown exterior. possibly once burnished. C. Form 11,
- 308 Fabric H (R 13), dark brown exterior, undulating rim. Diameter *c* 20-25 cm. E. Form 6.
- 309 Fabric H (R8); the exterior is brown and flaking. Large-diameter vessel. E. Form 9.
- 310 Fabric H (R4), including some coarse grains; the exterior is patchy orange-brown, possibly as a result of secondary burning, and the surface is flaking. Traces of 'ribbing' in manufacture on the rim and shoulder. C. Form 11.
- Fig 53
- 311 Fabric H (R1), dark grey, fairly soft, with coarse sand tempering. Grey to orange-red exterior: signs of differential burning after breakage. C. Form 12.
- 312 Fabric G (R6). brown exterior. Slight and irregular oblique finger tip decoration on the rim. C. Form 3.
- 313 Fabric H (R14), coarse sand tempering, orange exterior; the sherd is abraded and fairly soft. Diameter *c* 15-20cm. E. Form 11.
- 314 Fabric H (R22), heavily tempered with coarse sand; bright orange-red exterior below shoulder, interior tends to dark brown. The exterior shows signs of light vertical striation but is much abraded. C. Form 3.
- 315 Fabric H, brownish exterior. The rim is decorated with well-defined oblique thumb nail impressions and the body with vertical scoring, with some evidence of paired lines. Traces of a burnt substance adhering to the inside, evidently in charred spongy form, may be food remains (reported below p 118). C. Form 8.
- 316 Fabric H (R71), heavily tempered with coarse sand, brownish surfaces. E. Form 16.
- 317 Fabric H (R9), tempered with fine sand and vegetable material. Orange-red to brown exterior, brownish interior. C. Form 8.
- 318 Fabric H (R8), heavily burnt after breakage causing crazing, spalling, and surface coloration ranging from bright pink to buff. C. Form 2.
- 319 Fabric H (R1), heavily tempered with coarse sand. The upper part of the exterior is burnished, the lower part is rough and tends to orange-brown in colour. B. Form 15A.
- 320 Fabric H (R3), burnished on the rim and shoulder. C. Form 4.
- 321 Fabric H (R9), dark brown exterior; large-diameter vessel. D (non-joining).
- 322 Fabric H (R8), coarsely made, dark brown exterior. The rim is decorated with light oblique finger tip impressions and there are traces of

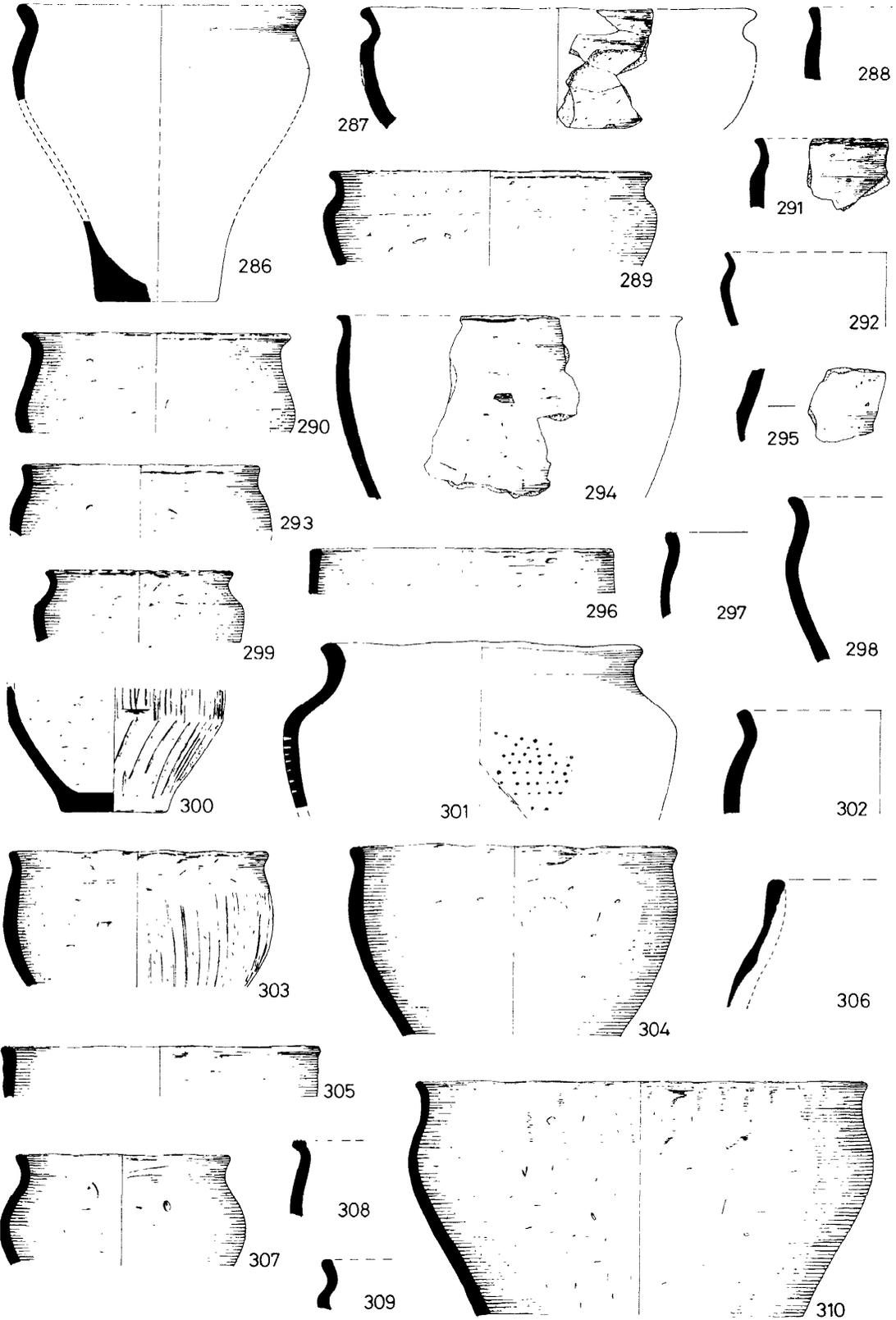


Fig 52 Little Waltham: pottery of Period III, 286-292, and Period IV, 293-310, scale 1:4

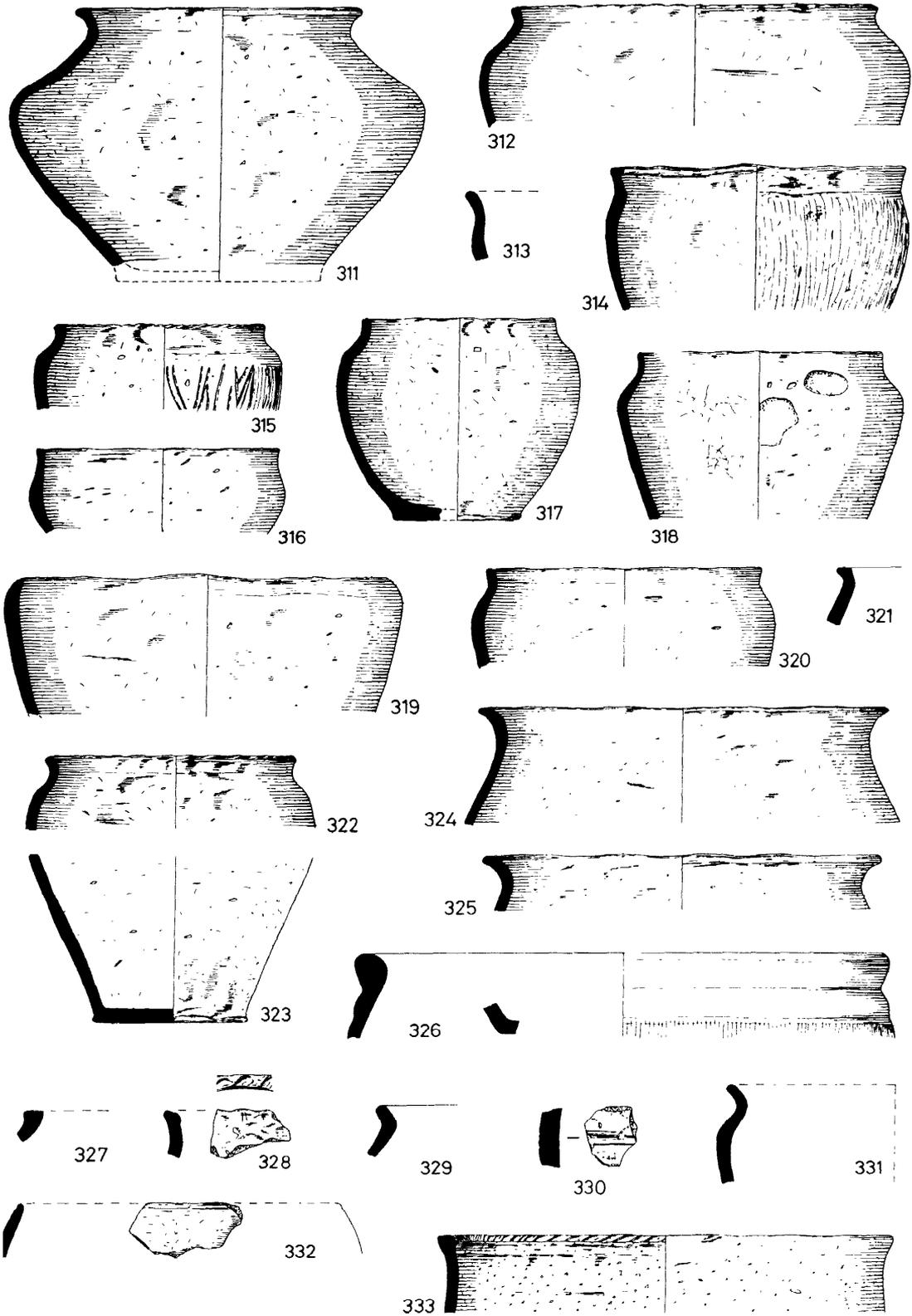


Fig 53 Little Waltham: pottery of Period IV, 311-326, and Periods II-IV, 327-333, scale 1:4

323 faint vertical striation on the body. C. Form 9. Fabric H (R71), tempered with coarse sand; orange-red to brown exterior. C.
Not illustrated: form 1,4 (1D); form 2,1; form 3,3; form 4,2; form 5,1; form 9,1; form 11,2

Feature 189

Not illustrated: form 3,1; form 4,1(D); form 11,1.

Feature 232

324 Fabric H (R1), patchy brown surfaces, abraded interior. C. Form 13.

325 Fabric H (R5), dark brown surfaces, traces of external burnishing survive despite abrasion. C. Form 13.

326 Fabric E, brown, granular with grey flecks; tempered with grog (grey and red) and some sand; probably hand-made; grey surfaces. The body has light vertical rilling. C (very fragmentary). The base angle (base *c* 25cm dia) is shown within the main illustration. Form 18.

Not illustrated: form 11,2.

PERIOD II-IV

From the spring line:

327 Fabric H (R8), with some fine, sharp, white grits; orange-red exterior. From a vessel of moderate diameter. E. Form unclassified.

328 Fabric H (R21), dark brown, tempered with coarse sand including quartzite grains up to 4 mm. Exterior reddish-brown, interior grey. The rim has finger tip decoration. Diameter *c* 30cm. E. Form 6.

From site clearance:

329 Fabric J (R2), brown, fairly soft, heavily tempered with fine flint grits. Reddish brown flaking surfaces. Diameter *c* 30 cm. D. From the vicinity of postholes 51 and 52.

330 Fabric E, brown, granular, with 'soapy' feel. tempered with vegetable material and a little sand; dark brown abraded surfaces. The exterior is decorated with 3 horizontal grooves somewhat irregularly executed. Large vessel. E. Form 18. From the alluvial silt north-east of hut C1.

331 Fabric H (R3), burnished on shoulder and rim, brownish colour on exterior below shoulder. E. Form 1. From the vicinity of the northern part of hut C17.

332 Fabric G (R6), with brown, flaking surfaces; exterior probably once burnished. D. Form 15C. From the southern area of the Period II settlement.

Residual in feature 259 (Period V)

333 Fabric J (R3), heavily tempered with flint grit. The surfaces are very rough, and the rim is decorated with faint oblique finger tip marking. E. Form 6.

Period V: Romano-British

Phase 1

CREMATION BURIAL., F360

Letters in brackets refer to the plan, Fig 28.

Fig 54 *Buff ware*

334(A) Single-handled flagon in cream fabric with a few grog inclusions, *Camulodunum* form 140B, there occurring in Periods I-VI, *c* AD 10-65.

335(F) Two-handled flagon similar to no 334, *Camulo-*

dunum form 161A, also occurring there in Periods I-VI.

336(G) Butt beaker in a cream/buff fabric, slightly more sandy than that of the flagons but with similar inclusions. There are three panels of rouletting divided by slightly raised cordons. The bottom was pierced (or worn through?) in antiquity. *Camulodunum*, form 113.

337(D) Butt beaker, smaller than, but otherwise similar to, no 336. *Camulodunum*, form 113.

Nos 336 and 337 are almost certainly products of the Colchester area (Hawkes & Hull 1947, 205) which also seems to be the source of the flagons, in view of the similarity of the two fabrics, Form 113 does not appear in the *Colonia* at Colchester, but was nonetheless probably manufactured down to the Boudiccan revolt (*ibid*, 239).

Terra nigra Miss Valery Rigby reports as follows:

338(B) Platter, *Camulodunum* form 14. in dark blue-grey. poor quality TN: no trace of a highly polished finish.

STAMP: copy of a name stamp, probably made by an illiterate die maker. One central impression. There are no identified parallels for this die, but from the style, fabric, and form of the platter it is late Claudia-Neronian.

339(H) Cup, *Camulodunum* form 56C, large size, in typical TN. The surfaces vary in colour from light to dark blue-grey, both retaining traces of the original highly polished finish.

STAMP: EDTAT, bordered, retrograde; one central impression. Seven other stamps from this die have been found in Britain, all on TN cups of form 56. Four are from *Camulodunum* (stamp no 124), where one was stratified in a Period II-III context (*c* AD 43-8; Hawkes & Hull 1947, 211); two more come from Colchester, and the other from Ardeley, Essex, nearby. At Nijmegen (Holwerda 1941) the stamp, no 137, occurs on a TN cup of the same form, from Cemetery C, *c* AD 30-70. The die was almost certainly made by the same die maker as *Cumulodunum* no 123, which reads EDATO retrograde. Neither die is securely dated but the potter was certainly at work during the Claudian period.

This was the only vessel to survive intact, apart from a chip on the rim probably sustained during use; indeed, the general impression is of a well-worn vessel.

Native ware

340(C) Small cup in soft, sandy, friable brown fabric with black surfaces. The pot was too shattered to permit reconstruction; the drawing is the best that could be managed from the fragments.

341(E) Small jar in fabric as no 340; wheel-thrown, though buckled in firing. *Camulodunum* form 221.

The butt beakers and *terra nigra* vessels suggest a terminal date of *c* AD 60 for the group, 338 belonging in the preceding decade. A date of deposit between AD 50 and 60 would also accord with the worn state of 339, and would fall within the accepted date-range of the other vessels.

DITCH 259, AREA A

This produced no pottery from the excavated sections, tempered fabric, and a small number of other early sherds, consistent with the Claudio-Neronian date suggested by the samian, noted above (p 40).

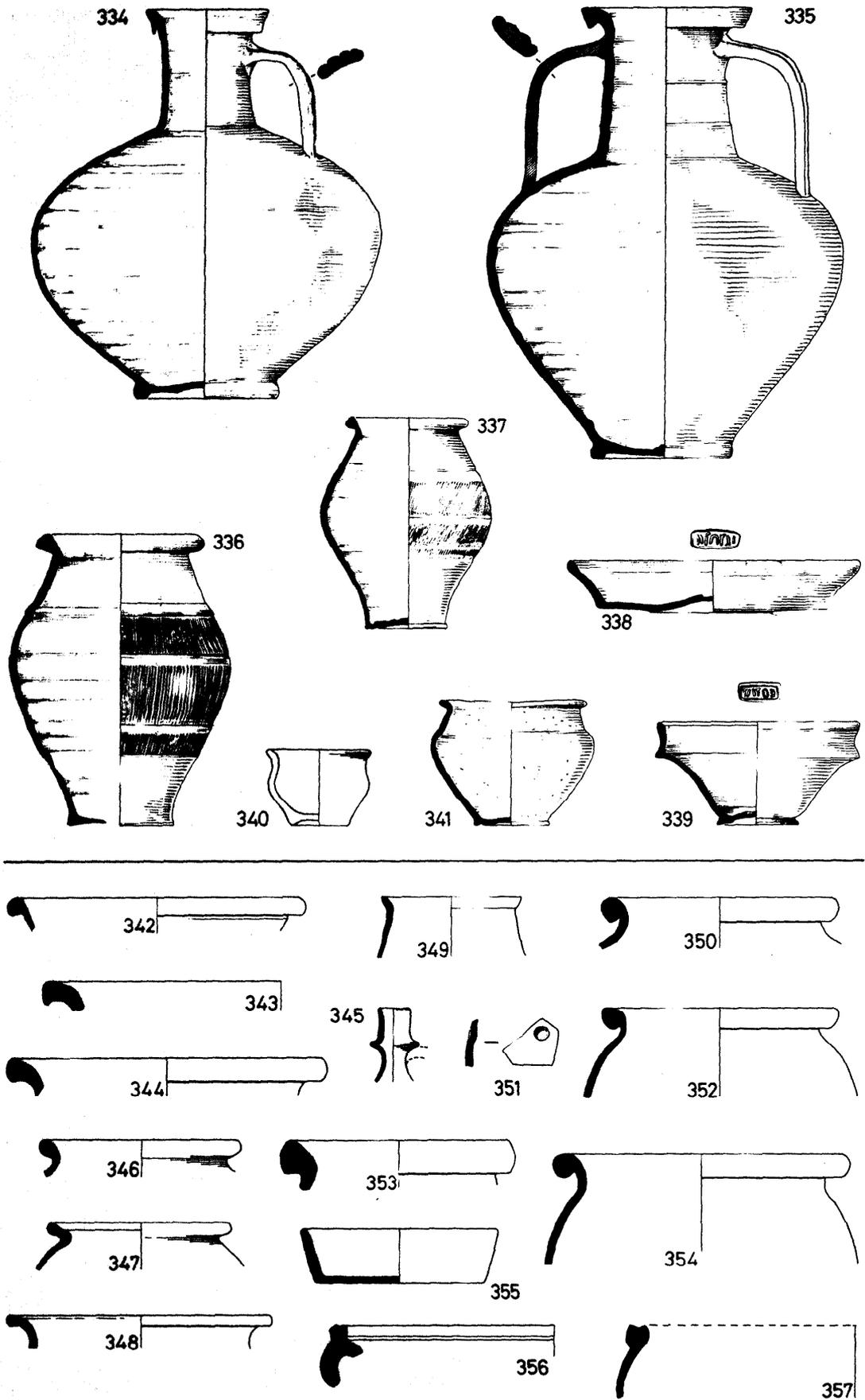


Fig 54 Little Waltham: pottery of Period V, phases 1 (334-341) and 2 (342-357), scale 1:4

DITCH 232, THE EARLY ROAD DITCH

This produced no pottery from the excavated sections.

Phase 2

A FIELD DITCHES

The material from these was generally sparse and fragmentary, spanning the period from the 1st to the late 3rd century; only in the case of ditch 314 can a continuation into the 4th century be postulated on ceramic grounds.

Feature 309

- 342 Jar in light grey finely sand-tempered fabric with traces of black surface.

Feature 312

This contained predominantly early Romano-British sherds.

Feature 313

Fragments included part of a Belgic/early Romano-British storage jar with stabbed chevron decoration on the shoulder.

Feature 314

- 343 Jar in coarse grey, granular fabric, brown flaking surfaces. Probably 1st century.

- 344 Jar rim in soft, grey, shell-tempered fabric, light brown surfaces with many lacunae. Late 4th century onwards; cf Clarke, J (1972) with an illustration of a similar jar from Lower Thames Street, London, and discussion in Drury *et al* 1976,45. Found near the junction with feature 313.

Feature 338

Not illustrated: mortarium fragment in crude, reddish-brown grog tempered fabric; crushed burnt flint grits.

- 345 Flagon neck in fairly soft orange-brown fabric with dark brown colour coat. *Roman Colchester*, form 360, there dated 3rd-mid 4th century; Hull 1958, fig 61. 34, from the 'Mithraeum' filling, is a closer parallel than the type figure.

Feature 349

This contained predominantly early material, presumably explicable in terms of the early origins of the roadside ditch.

Feature 351

- 346 Jar in finely sand-tempered grey fabric.
- 347 Jar in dark grey fabric tempered with finely crushed calcined flint. This was the most common fabric for coarse jars on the site. The type is regional, occurring over much of Essex; it seems to have appeared during the 3rd century and to have continued in production until the end of the Roman period. The origin of the Waltham material is unknown, though the suggestion by Bazett and Chapman (1966) of a local centre of production may be correct. Kilns at Rettendon, Chelmsford, and Sandon are known to have been making similar material during the 4th century (Drury 1976). The range of forms present at Waltham was illustrated by Bazett & Chapman (1966, fig 4, 55), though their comments on dating should be treated with caution. The jar with a frilled pedestal base (no 7) would not be out of place in the 3rd century.

Feature 353

- 348 Jar in brown sand-tempered fabric with traces of black surface.

B THE FENCED ENCLOSURE

Predominantly 3rd century material, as follows:

Feature 340

- 349 Beaker rim; grey core, pink subsurface, dark brownish-black colour coat. The sherd is abraded and contains a flint fragment c 5 mm square.

Feature 344

- 350 Jar in dark grey fabric with coarse flint grits.

Feature 345

- 351 'Romano-Saxon' sherd in fine grey fabric, exterior once black. A single dimple survives. This need not be later than the end of the 3rd century (cf Frere 1972, 264).

Feature 346

- 352 Jar in dark grey fabric with fine flint grit.
- 353 Jar in dark grey fabric with very coarse flint grits.

Feature 360

- 354 Jar in dark grey flint-gritted fabric, reddish tinge on the exterior.

Unstratified and residual material

- 355 Bowl in finely sand-tempered grey fabric with a black surface now almost eroded away. From feature 370, Period VII.

- 356 Buff mortarium with pinkish core; no grits survive; cf Frere 1972, fig 131. 1053, dated there c 160-75. From feature 337, Period VI.

- 357 Jar in grey, once shell-tempered fabric now vesiculated due to the acid soil; surfaces brownish-red. Ledged rim jars in this fabric are one of the commonest forms of coarse pottery in Southern Essex in the 1st century, though they become noticeably rarer towards the north. Kilns producing these types at West Tilbury were Flavian (Drury & Rodwell 1973, figs 16-17), but examples occur in Claudian contexts in Chelmsford,³¹ occasionally with pre-firing graffiti. From feature 303.

Not illustrated: fragment of wall-sided mortarium in buff fabric, unstratified from area B.

C THE WELL, F339: lower sludge filling

Fig 55

- 358 Large folded beaker (5 ribs) in a hard grey fabric with shiny 'metallic' slip coat, burnished on the shoulder. Slightly distorted in the kiln.

- 359 Flagon, neck missing, in a fine hard red fabric, slip-coated and burnished. The broken edge has been abraded in antiquity, possibly suggesting use for raising water in the state in which it was excavated. The fabric and recessed base suggest that it may be a product of the Hadham (Herts) kilns.³² A similar example was found by Bazett and Chapman in the refuse pits, 1960-3 (fig 5.22, p 57).

- 360 Flagon sherd in a thin, very light grey fabric with horizontal stripes of brown paint. Mark left by applied handle visible on the exterior. Rare in this area, possibly from the Nene Valley.

- 361 Bowl, fabric and finish as no 358.

- 362 Bowl, in black fabric with burnished finish.

- 363 Bowl, in grey fabric, slightly underfired; traces of metallic slip coat.

- 364 Narrow-necked jar, fabric and finish as no 358, decorated with rouletting and a burnished wavy band. Fragments of other jars similarly decorated with straight and wavy lines on the shoulder occurred in this layer.

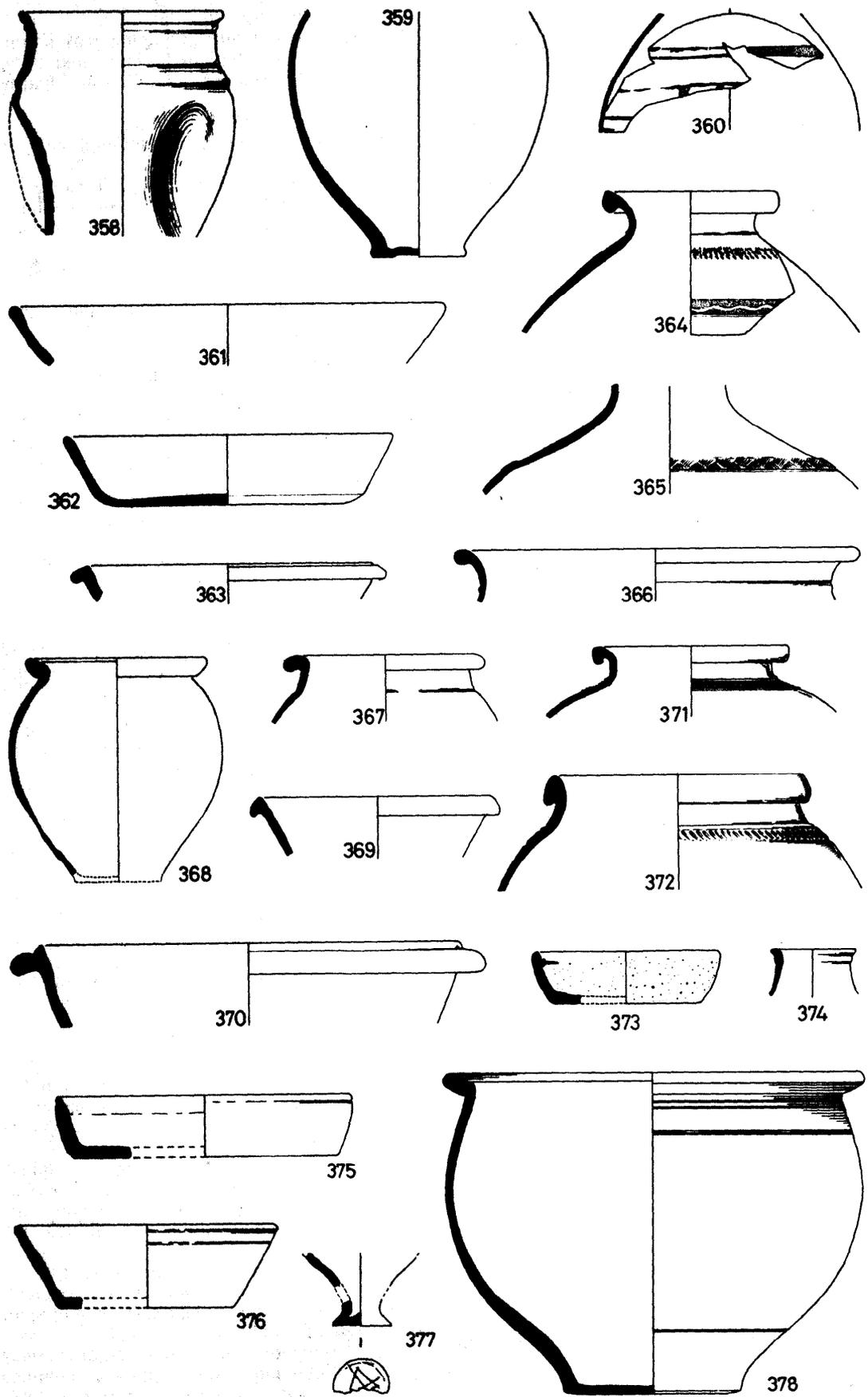


Fig 55 Little Waltham: pottery of Period V, phase 2, 358-378, scale 1:4

- 365 Narrow-necked jar, fabric and finish as no 358, with rouletted decoration on a raised cordon.
- 366 Jar, fabric and finish as no 358.
- 367 Jar in grey gritty fabric, sooted externally,
- 368 Jar in fabric similar to no 367, heavily sooted externally and coated with 'lime' deposit internally—probably used for boiling hard water. The profile is based on several non-joining sections.
- Not illustrated:* (i) base of large jar in grey flint-gritted fabric.³⁵
- (ii) small fragments of colour-coated vessels.
- (iii) residual sherds of ? butt beaker.
- From the clay filling*
- 369 Jar with rilled shoulder in grey sandy fabric.
- 370 Jar in light grey sandy fabric.
- 371 Beaker rim in hard grey fabric.
- Not illustrated:* (i) folded beaker sherds in pinkish fabric, applied strips on ribs, thin brown coat; Colchester manufacture.
- (ii) beaker sherd, black coat on buff fabric, decorated with extended phallae *en barbotine* and rouletted.
- (iii) heavy pedestal base.
- (iv) small flagon neck with two handles in soft red fabric with traces of slip coat, probably Much Hadham.
- (v) two fragments of Oxfordshire red colour-coated ware.
- (vi) much flint-tempered material.
- (vii) residual sherds including several of a soft under-fired orange fabric; probably from a 1st century Colchester flagon; with a single ribbed handle.
- From the upper loam filling*
- 372 Bowl in soft light brown fabric-
- 373 Bowl in grey gritty fabric, eroded.
- 374 Bowl, fabric as no 373.

Not illustrated: (i) ledged rim jar similar to no 368;

(ii) fine sherd of red fabric with dark blue-black colour coat, probably Colchester;

(iii) residual material including a sherd of an amphora in soft pink fabric, probably Spanish. A hole had been bored through it after firing, probably to facilitate repair with rivets.

D PIT, F361

- 375 Bowl in hard, charcoal grey coarsely sand-tempered fabric with traces of internal burnishing.
- 376 Bowl, in grey-brown finely sand-tempered fabric with black surfaces, burnished externally.
- 377 Pedestal base of small beaker, in soft brown fabric with grey surfaces; traces of external burnishing. A graffito, probably comprising a superimposed cross and triangle. has been scratched on the base after firing.
- 378 Jar in smooth grey fabric. with traces of black external finish, probably once burnished, cf Frere 1972, fig 134. 1157, there dated AD 310-15.

Not illustrated: fragment of roll-rim storage jar in similar fabric.

The best dating evidence for the well and pit groups comes from the associated coins, which place the filling of the features, and the cessation of intensive occupation of the site generally, in the final quarter of the 3rd century. The appearance of Oxfordshire colour-coated wares in small quantity provides some corroboration of this dating, as does the date of a vessel such as no 378, an unusual type, elsewhere.

Phases 2/3

THE HOLLOW WAY, F350

Fig 56

- 379 Bowl in grey finely sand-tempered fabric.
- 380 Folded beaker base in fine grey fabric with black surface similar to no 378; much abraded.
- 381 Beaker rim in orange-buff fabric with dark brown colour coat, lighter on the interior.
- 382 Fine beaker in grey-white fabric with chocolate brown slip, rouletted. Probably from the Nene Valley. Similar to Frere 1972, fig 133. 1117, there *c* AD 280-315.
- 383 Bowl rim in buff-white fabric, burnt, with traces of chocolate brown coat. Late Nene Valley; at the Jewry Wall site, Leicester, this fabric is not found in significant quantities before Period IX, dated to the first quarter of the 4th century; the form, however, may be a late one, since it only occurred on that site unstratified (Kenyon 1948, 119-21, 195).
- 384 Reeded rim of a mortarium in hard fine off-white fabric; non-joining base and body sherds have angular black ironstone grits. From the Northampton area, 3rd-4th century.³⁴

This feature contained a substantial amount of pottery, mostly non-joining and abraded; mechanical excavation of much of the filling undoubtedly led to the loss of a proportion of the material. Most of the material was of the 3rd century, comparable with that illustrated from other features; some, however, could be later, especially nos 382-4, which tend towards a date in the early 4th century.

The Roman Road cemetery

Numbers preceded by CM are Chelmsford Museum accession numbers.

- Pottery from the 1929 excavations*
- 385 Flagon in light grey finely sand-tempered fabric with red subsurface; coated in cream slip now mostly eroded. Complete except for a modern fork hole. Probably 2nd century. CM B 18259.
- 386 Flagon in fairly soft, fine, bright red fabric. There are two holes in the body, one ancient, the other a recent fork hole. The rim was presumably destroyed by ploughing. CM B 18253.
- 387 Carinated beaker in brown, friable fabric. black burnished exterior. CM B 18257; cf Frere 1972. fig 123.840, *c* AD 150—155/60, but this example could be earlier on the evidence of the fabric.
- 388 Shallow bowl in soft micaceous brick-red fabric with some sand and grog tempering. A single large sherd, much eroded, comprising about one-third of the vessel. CM B 18255; cf Frere 1972. fig 114.526, *c* AD 105-50, orange paste, mica-coated (as this example may have been) and fig 120.738, *c* AD 130-50, in hard buff fabric.
- 389 Small narrow-necked jar in brown fairly granular fabric. Rim damaged. CM B 18256.
- Pottery from the 1948 excavations*
- 390 Jar in greyish-brown sand-tempered fabric. Most of the rim and neck are missing. CM B 18265.
- 391 Jar in hard brown sand-tempered fabric with light grey surfaces; the rim distorted during firing. CM B 18262.

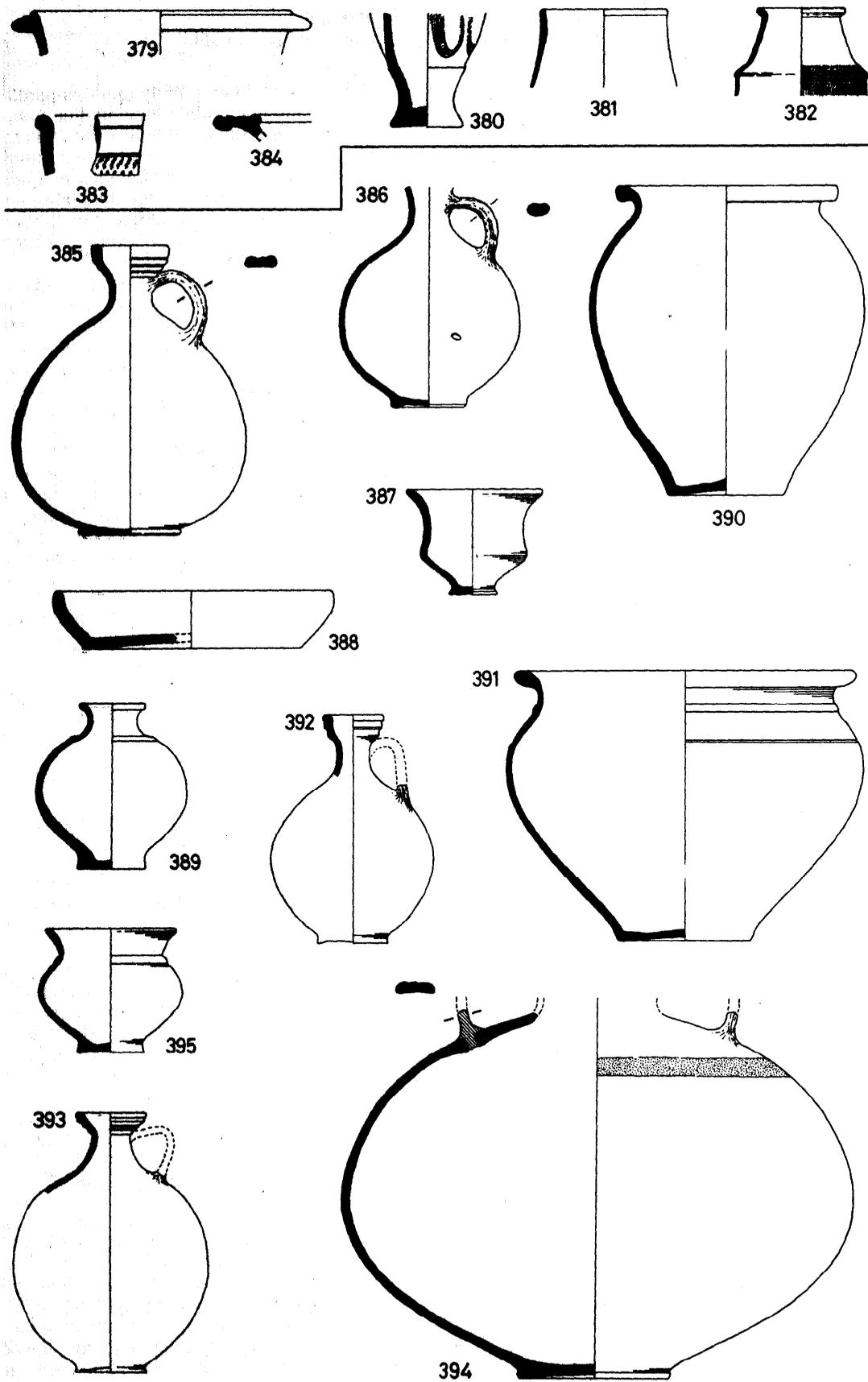


Fig 56 Little Waltham: pottery of Period V, phases 2/3, 379-384, and from the Roman Road cemetery, 385-395, scale 1:4

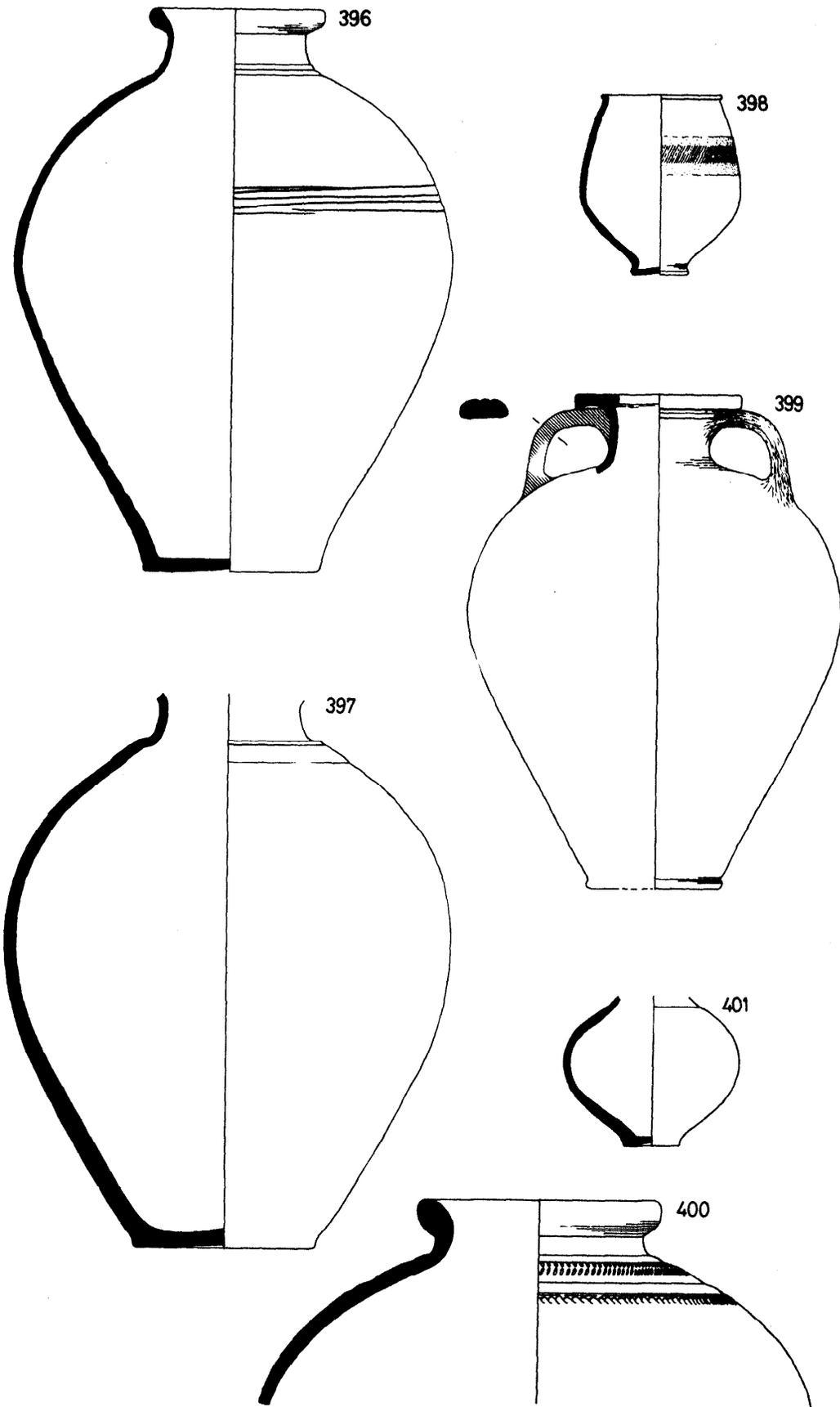


Fig 57 Little Waltham: pottery from the Roman road cemetery, 396-400, and from 'High Hedges', 401, scale 1:4

- 392 Flagon in very soft, friable buff fabric with some grog. CM B 18266. Probably 2nd century.
- 393 Flagon in fabric similar to no 392, but harder and containing much grog. CM B 18267; cf Frere 1972, fig 122.800, c AD 150-155/60.
- 394 Squat flagon in orange fabric with some grog and sand tempering, with a darker surface where this is not eroded. A band of black paint high on the body was applied whilst the pot was upside down, runs being visible. The handles and neck seem to have been broken off before burial; the breaks are well rounded and a samian bowl was found acting as a 'stopper'. The method of attachment of the handles—they are pushed through a hole in the body—and the recessed base are typical of the products of the Hadham (Herts) kilns, cf no 359 above.³⁵ The date is unlikely to be before the middle of the 3rd century. CM B 18273.
- 395 Poppyhead beaker in fine pale brown fabric with black core. The lack of barbotine dots is unusual, but since the whole of the vessel has been abraded in 'restoration' they might once have existed. CM B 18264. An example (without dots) from Chichester probably belongs to the first half of the 2nd century.³⁶

Fig 57

- 396 Narrow-necked jar in fine sandy grey fabric, with irregularly incised lines on the body. Half of the upper part is missing. CM B 18272.
- 397 Narrow-necked jar in coarse grey-brown sandy fabric. The rim and much of the upper half are missing; the vessel seems to have been truncated by ploughing. CM B 18275.

Not illustrated: 397A The lower part, and a few fragments of the upper part below the rim, of a similar narrow-necked jar in friable brown fabric. Again probably truncated by ploughing. CM B 18271.

- 398 Beaker in fine grey ware decorated with rouletted band; now abraded but probably once burnished apart from two bands above and below the rouletting, CM B 18269. *Roman Colchester* form 392; could be later 2nd century but perhaps more likely to belong to the early 3rd century.
- 399 Two-handled flagon in orange-brown fabric tempered with fine sand; traces of external burnishing. There is a hole in the bottom of the vessel, now filled with plaster. The rim is highly unusual, being applied as a ring of clay to the body, after throwing. An almost identical rim was found at Billericay in 1973, unfortunately residual in a recent feature.³⁷ CM B 18268.
- 400 Fragment of a large storage jar, c 20cm x 20cm. possibly used to cover the mouth of another vessel. Coarse brown heavily sand-tempered fabric, greyish exterior, fairly soft, eroded. The elaborate stabbed decoration tends to suggest a 3rd century date. CM B 18276.

Pottery from 'High Hedges', 1956

- 401 Small jar in soft grey sandy fabric with reddish-brown flaked surfaces. Probably 2nd century.

Period VI: Early medieval

The Period VI pottery is in two principal fabrics, as follows:

- 1 Grey fabric, heavily tempered with sand; dark orange-brown surfaces with lacunae probably due to the original presence of a small amount of shell or vegetable tempering.
- 2 Hard grey sand-tempered fabric, brownish-red sandy exterior surface.

Phase 1

- Fig 58 *Feature 306*
402 Fabric 1.
403 Fabric 1, black interior surface.
404 Fabric 1, black interior, many lacunae.

Phase 2

- Feature 307*
405 Sherd with applied strip in fabric 2.
406 Fabric 2.
Feature 330
407 Fabric 1.
408 Fabric 1.
Feature 328
409 Cooking pot in fabric 1 with finger-pressed rim.
Feature 329
410 Fabric 1.
411 Jug in fabric 1.
412 Sherd in fabric 1 containing white grains in the sand; decorated with a wide applied strip.

A small group of pottery from Waltham Abbey (Huggins 1972, 99-100, fig 19. 1-8) is generally comparable with the Period VI material 402-12, and is dated c 1150-1250. Another comparable group of 12th to 13th century date is published from the Bloomery Forge at Waltham Abbey (Huggins, P J & R M 1973, 163-6, fig 9). The jug 411 has a flat strap handle of the type common to many late Saxon and Saxo-Norman handled vessels, both insular and imported (see Dunning *et al* 1959, figs 13, 15, 16, 23, and 36) and seemingly typical on the (largely unpublished) evidence of early medieval coarse-ware jugs in central Essex. The broad applied strip of 412, and particularly its relatively 'soft' outline, indicate a relatively early date, although probably not before the middle of the 12th century, for the technique was absent from Blunts Hall, Witham, convincingly assigned to the 'Anarchy' (c 1135-50) by Trump (1961, 40); indeed the material from that site is markedly different from that of our Period VI. The forms represented at Waltham, the high proportion of the once partly shell-tempered fabric 1, and the absence of glazed wares strongly suggests a late 12th century date. although the material from F307 (405, 406) seems likely to be later, resembling early 13th century material from Writtle (Rahtz 1969, fig 52, esp no 11).³⁸

Periods VI/VII: Medieval to post-medieval

- Feature 337*
413 Fabric 1.
414 Fabric 1.
415 Fabric 2.
416 Fabric 2, brown sub-surface, grey surfaces.
This material seems to range in date from the 12th century or earlier (413) to the mid-late 13th century (416).
Feature 243, area A
417 Fabric 2, dark grey exterior surface; 13th-14th century.
Unstratified, area B
418 Hard, orange-brown sand-tempered fabric, similar to fabric 2; 13th century.
419 Fabric 1; 12th-13th century.

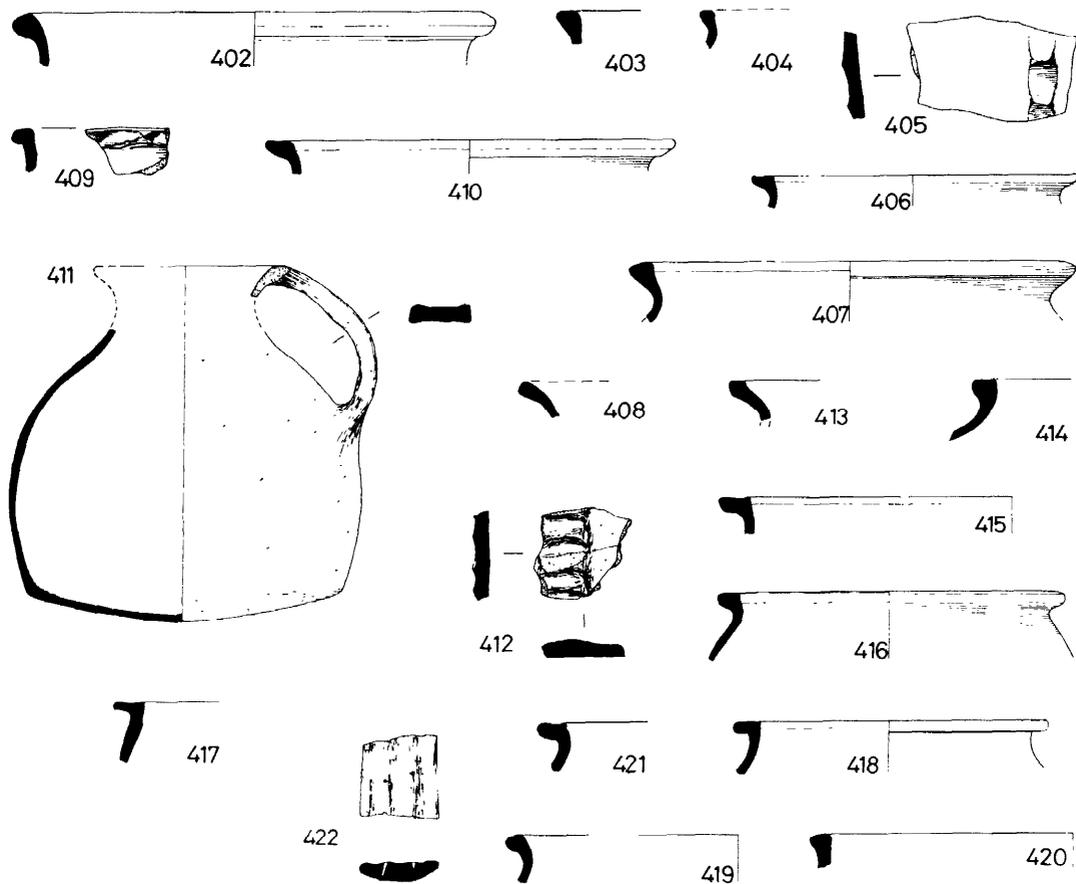


Fig 58 Little Waltham: pottery of Period VI, 402-22, scale 1:4

- Unstratified. area A*
- 420 Near fabric 1, soapy feel, with many lacunae; dark brown to black exterior surface. Intrusive in hut C8B wall trench, Period II; 12th century?
- 421 Fine, hard, dark grey fabric, probably 13th century.
- 422 Jug handle in grey, finely sand-tempered fabric; orange-red surfaces covered with off-white slip. Glazed with a near colourless glaze mottled green. The stab marks penetrate almost the full thickness of the handle. Probably 13th century.

2 Terra sigillata

W J Rodwell

Catalogue

Period V features

- F259 Four adjoining rim sherds, f 15/17. SG. Surface gloss mostly destroyed by soil acid. Claudian-Neronian.
- F313 Fragment of indeterminate form, CG, 2nd century.
- F339 Fragment, f 18, SG, late 1st century, and two burnt chips also 1st century. Rim f 38, CG, later 2nd century.

- F345 Chip f 38, EG, late Antonine.
- F349 Fragment f 31, ?EG, Antonine.
- F350 Rim f 35/36, burnt, but probably SG, 1st century. Rim fragments of forms 33, 38; CG, Antonine. Rim f 31, EG, late Antonine. Four fragments of indeterminate form, CG, 2nd century.
- F351 Crumb, EG, 2nd century.
- F353 Fragment f 31R, EG, late Antonine; plain sherd, possibly f 37, CG, Antonine; fragment of f 38, CG, Antonine.
- F363 Basal fragment f 30, SG, 1st century and possibly pre-Flavian.
- F364 Chip, EG, 2nd century.
- F365 Rim f 33, EG, late 2nd-early 3rd century.

Period VI features

- F307 } Chip, CG, 2nd century, from each.
- F336 }

Unstratified, area A;

Footring fragment, f 38 or f 45, burnt, late 2nd century.

Unstratified, area B;

Fragments of forms 31R, 33 (trace of burning), ?38, 45, all CG, late Antonine. Small decorated

sherd, f 37, Lezoux ware; probably Cinnamus group, c AD 150-80. Two chips, CG, 2nd century.

Swimming pool, 1959 (site 3, p 44)

Footring, f 15/17 or f 18, SC, pre-Flavian and probably Claudian.
Chip, SG, 1st century AD.

Discussion

The sherds examined are mostly small, abraded, and clearly residual in the contexts in which they were found. They are divisible into two groups: first, a small number of South Gaulish sherds of mid 1st century date which show that the occupants of the site were able to purchase *sigillata* in the pre-Flavian period. The appearance of such early material on a rural site may be of significance, but as the main area of occupation clearly lay outside the excavated area, no conclusions can be drawn from the presence of these few sherds. *Sigillata* of the later 1st and first half of the 2nd century is never common on rural sites in Essex and is almost totally absent from this site. The second group, to which the majority of sherds belong, covers the later Antonine period; only the commonest forms are represented and include but one decorated sherd. Once again, it gives the impression of being material scattered from a nearby occupation site, presumably that adjoining area B to the east.

Material from the Roman Road cemetery

Numbers with the prefix B are Chelmsford Museum accession numbers.

- 1 Platter, form 36, near complete (rim diameter 16.7cm). The vessel is of an uncommon type, having no ivy leaves *en barbotine* on the rim. The surface has a high gloss, which is well preserved; there is little wear on the footring. Central Gaulish. Trajanic-Hadrianic. Found in building operations, 1929. B 18251
- 2 Deep dish, form 18/31-31, near-complete (rim diameter 18.0cm). The gloss is in a good state of preservation but the stamp was poorly impressed and is now illegible. It has been said to read CAL-
ENDIO (retrograde), but does not fit any known die and is not a product of the Lezoux potter of that name. It is possible that the stamp is an illiterate one. The graffito III has been cut on the footring after firing. East Gaulish, Hadrianic-Antonine. Found in building operations, 1929. B 18252.
- 3 Platter form 36, complete (rim diameter 15.8cm); gloss abraded in parts. Probably South Gaulish and of late 1st century date. From the 1948 excavations group 7; B 18270.
- 4 Platter of Ludowici type Tg, complete (rim diameter 17.6 cm). The gloss is badly abraded and there is no sign of a potter's stamp. Central Gaulish, Antonine. From the 1948 excavations, group 4; B 18263.
- 5 Flanged bowl, form 38, near-complete (rim diameter 14.4 cm). The gloss is badly abraded and the potter's stamp totally excoriated. Central Gaulish; second half of the 2nd century. From the 1948 excavations, group 6; B 18274.

3 Roman coins

Richard Reece

Thirteen Roman coins were excavated in 1970-1, and fourteen by Bazett and Chapman in 1960-3. In view of the erroneous published identification of the latter, they are included in the following report (numbers preceded by L are Chelmsford Museum accession numbers for the 1960-3 coins)

Feature		
314	Period V, ditch	Sestertius, probably of Hadrian
339	Period V, well upper filling	Gallienus, RIC 189 Two barbarous radiates, AD 270-90
340	Period V, enclosure slot	1st or 2nd century Sestertius, probably Antoninus Pius
345	Period V, enclosure slot	Claudius II, RIC 266
350	Filling of Period V hollow way	Two Gallienus, RIC 195, 266 Four barbarous radiates, AD 270-90 (L28014, 28015)
364	Period V, ditch	Barbarous radiate, AD 270-90
371	Period V, posthole	Sestertius of Hadrian
unstratified	Area A	2nd century Sestertius, possibly Trajan
unstratified	Tennis court area	Dupondius or As possibly Lucius Verus (as 1291), L 28017
Destruction level	above hut floor, tennis court area 1960	Four barbarous radiates, AD 270-90, L 28018: 1-4
1963 pit		Tetricus I, reverse uncertain, L 28022: 1 Antoninianus of Gallienus, RIC 304, L 28020 Five barbarous radiates, four of which certainly belong to the late 3rd century

All the coins are in poor condition, making identification difficult. Of the sixteen barbarous radiates, almost all can be satisfactorily assigned to the late 3rd century by a small remaining piece of the obverse or reverse design, but in only one case is enough left of the surface to suggest a prototype which has been copied. The one legible coin shows a female figure with a palm branch, copying the *Hilaritas* reverse of Tetricus I. The number of these coins, and others probably in contemporary circulation may suggest a scattered hoard, probably deriving from the building in the tennis court area. In general the range of coins reflects the varying intensity of occupation of the site discussed in detail above, particularly the virtual abandonment in the 4th century, illustrated by the complete absence of the usually common coins of that period.

4 Objects of bronze (Fig 59)

Period II

- 4.1 (unfigured) Fragment of thin sheet, probably c 5 mm in diameter when excavated. Hut C17B, wall trench, from the primary filling.
- 4.2 (unfigured) Fragments of sheet, c 0.5 mm thick, probably about 10 mm in diameter when excavated. Hut C8, wall trench, 0.30m deep.

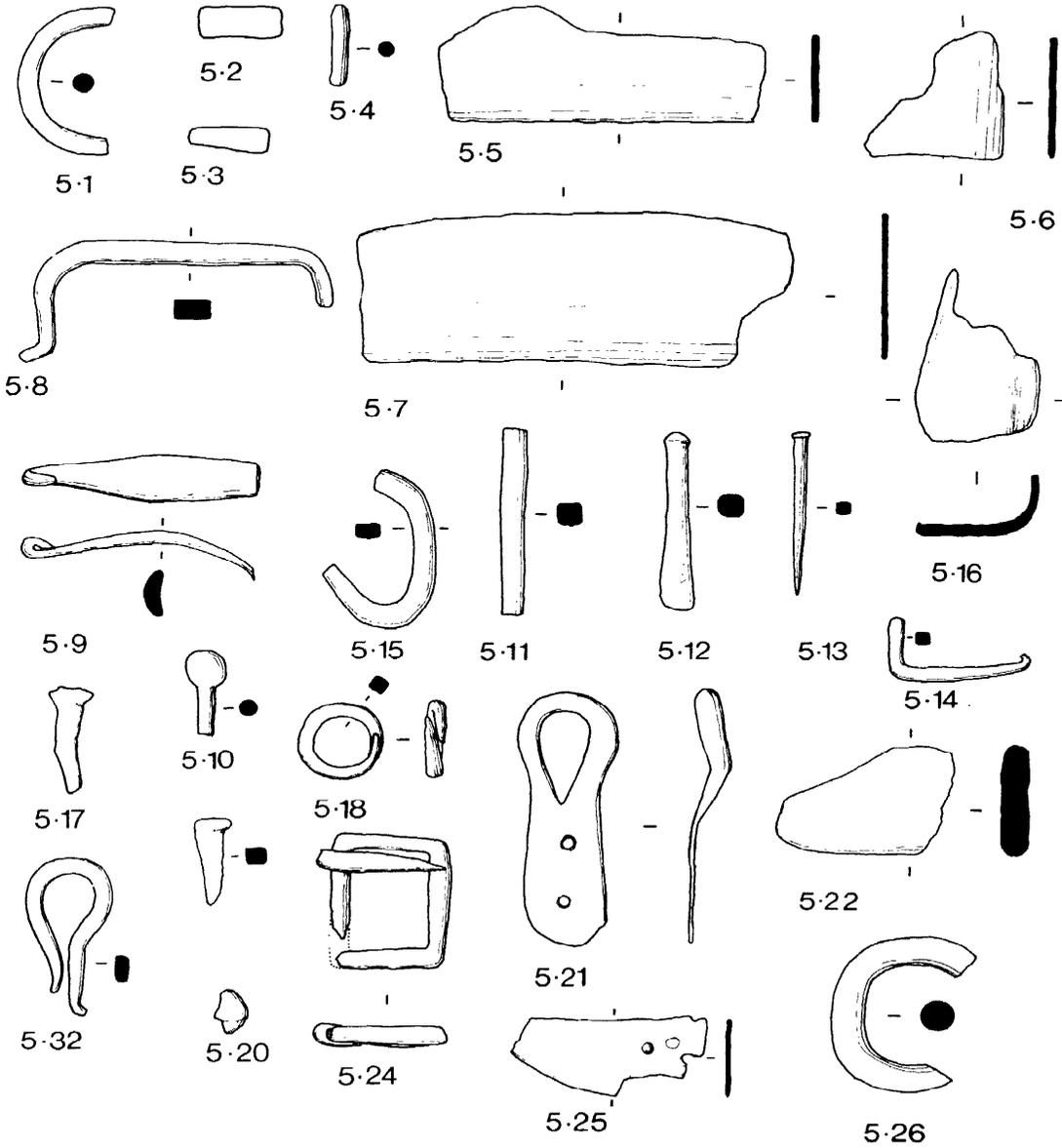
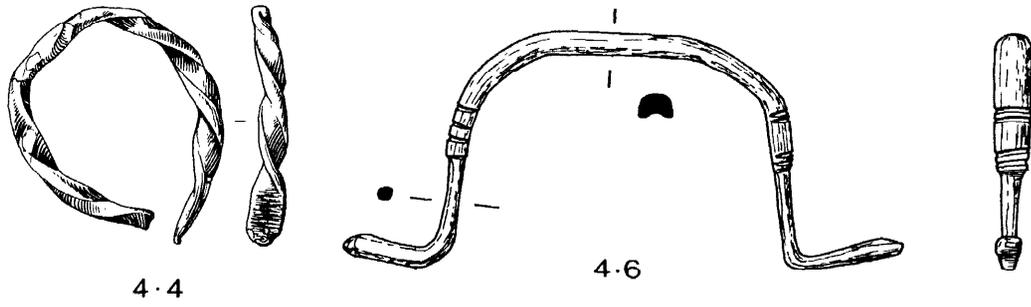


Fig 59 Little Waltham: objects of bronze, 4.4, 4.6, scale 1:1, and iron, 5.1-5.26, scale 1:2

Period III

- 4.3 (unfigured) Small fragment of thin sheet. *c* 2mm x 4mm. From F 263.

Period V

- 4.4 Fragment of a bracelet, formed by twisting a flat strip of bronze. Incomplete, and bent after breakage in antiquity to form a rough loop. Another fragment may be part of the same object. Upper filling of the well, F 339, *c* AD 300. For a parallel, see Brodribb *et al* 1972, 71, no 131, late Roman.
- 4.5 (unfigured) Fragments of very thin sheet bronze binding. *c* 10 mm x 15 mm. probably from leather-work. From the hollow way, F 350, at the western end.
- 4.6 Handle, perhaps of a casket, in cast bronze. From the Roman Road cemetery, 1929. Chelmsford Museum, B 18258.

Period VII

- 4.7 (unfigured) Lace end, 14 mm long, ribbed. Late medieval, from the lower filling of ditch 261.

In addition, a fragment of bone with distinctive green staining, apparently from contact with a bronze object no longer extant at the time of excavation, was found in the Period III feature 255. For possible casting debris, see below (p 116).

5 Objects of iron (Figs 59, 60)

A Objects from Iron Age contexts: Periods II-IV

C Saunders

All the 30 iron objects listed below have been X-rayed at the Ancient Monuments Laboratory. As a group they are typical of normal site finds, in that many of the pieces are small and fragmentary and can only be catalogued in descriptive terms rather than in terms of function. Many are badly corroded, and even with the help of radiographs their exact form remains uncertain. The entire group is illustrated in Figs 59-60.

Period II

- 5.1 Half of a ring of originally 35 mm diameter, made from circular cross-sectioned rod 7mm in diameter. Such rings are not uncommon and could have had a variety of uses; cf 5.26. Hut C3, wall trench.
- 5.2 Small fragmentary rod probably 10mm square in cross-section. Overall length 23 mm. Hut C4, wall trench.
- 5.3 Small fragment of badly corroded rod of indeterminate cross-section. Overall length 22mm. Hut C4, wall trench.
- 5.4 Small fragment of circular cross-sectioned rod. Overall length 25 mm. Hut C6, wall trench,
- 5.5 Fragmentary strip, probably part of a binding for a wooden object. Overall length 90mm. Thickness 2mm. Hut C8, wall trench.
- 5.6 Fragment of plate *c* 2mm thick. Hut C8, wall trench.
- 5.7 Large fragment of plate/strip. Overall length 125mm. Thickness 1.5 mm. Hut C8, wall trench.

- 5.8 Small dog or staple, one end clenched over, the other missing. Made from a bar of rectangular cross-section, 10mm x 5mm, tapering to a point at the end. Overall length 8.2cm. Hut C9, wall trench.
- 5.9 Fragmentary curved strip of plano-convex cross-section, tapering to a point at the surviving end which has been turned over. Overall length 66 mm. Maximum width 15 mm x 3 mm thick. Hut C10, wall trench.
- 5.10 Pin with spherical head and shank of circular cross-section, 5 mm in diameter. Overall length 26mm. Perhaps a dress pin, although iron pins other than the normal ring-headed variety are practically unknown. Hut C10, wall trench.
- 5.11 Badly corroded square-sectioned rod 7 mm thick. Overall length 58 mm. Hut C10, wall trench.
- 5.12 Badly corroded rod of ? rounded rectangular cross-section 7mm thick. Apparently hammered at one end to form a head. Perhaps a large rivet. Hut C11, wall trench.
- 5.13 Badly corroded nail shank. Overall length 50mm. Hut C12, wall trench.
- 5.14 Badly corroded nail shank bent to a right angle and with the point turned over. Of square cross-section, maximum thickness 5 mm. Hut C14, wall trench.
- 5.15 A fragmentary chain link of indeterminate cross-section, maximum thickness 6 mm. Overall length 49 mm. Hut C18, wall trench.
- 5.16 Fragments perhaps of a socketed implement. Hut C18, wall trench.

Period III

- 5.17 Badly corroded nail shank. Overall length 33mm. Hut C1, gully.
- 5.18 Small spiral ring formed of square-sectioned rod, the overlapping terminals tapering to a point. The internal diameter of 16-17 mm shows that this is a finger ring of the wellknown class more commonly found in bronze (Jope & Wilson 1957, 79-81). This example falls well within the normal distribution of the type. For iron examples, cf Glastonbury (Bulleid & Gray 1911, pl XLI, I6, I15, I19). Hut C1, gully.
- 5.19 Part of the head and shank of a badly corroded nail. Overall length 27 mm. Hut C2, gully.
- 5.20 Hobnail with conical head. No hobnails have been recorded from secure pre-Roman contexts, hence this may be intrusive. Overall length 13 mm. F14, at cleared level.
- 5.21 Mount for a bucket handle, consisting of a plate, rounded at the bottom and pierced by two rivets by which the plate was fastened to the side of the bucket immediately below the rim. This plate is surmounted by a ring to which the bucket handle was attached. Overall length 79 mm; from F253. I know of no other bucket mount of this type; in fact iron bucket fittings have rarely been recovered as site finds. That buckets were commonly used is shown by the surviving wooden fragments from Glastonbury (Bulleid & Gray 1911, 313, 320) where both stave-built and two-piece vessels occurred. Further evidence comes from several La Tene III graves (Stead 1971, 274, fig 11) where bucket fittings have been found, and from a series of bronze mounts (Hawkes 1951). Our present piece could have held either a ring handle or a

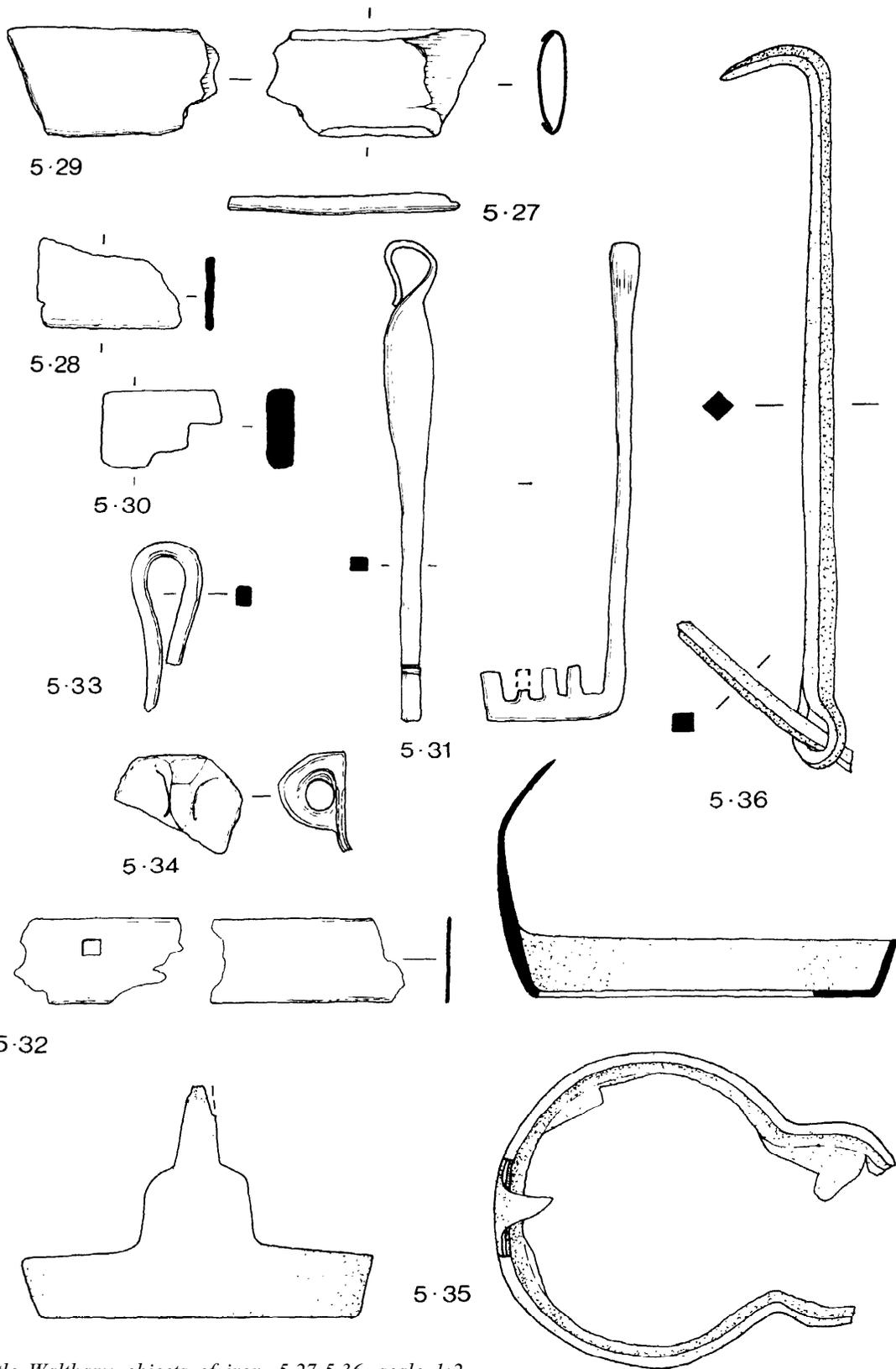


Fig 60 Little Waltham: objects of iron, 5.27-5.36, scale 1:2

swing handle, but more probably the latter. At least a dozen handles of the swing form have been found on settlement sites. These can be divided into two types by means of the way they were attached to the bucket. Type 1 has a loop at each end of the handle set at a right angle to the plane of the curve; type 2 have their ends turned into loops set in the same plane as the curve of the handle. In all examples of type 1 the loop is closed, suggesting that the handle was riveted to the handle attachment, although a handle from Cassington, Oxon (Harding 1972, pl LXXVI, F) appears to have been riveted directly into the wood of the bucket. Handles of type 2 have open loops and these would have hooked into a mount of our type. These swing handles show that the buckets they fitted were 130-255 mm in diameter.

- 5.22 The tip of a fragmentary bar tapering to a rounded point. Maximum width 32mm, thickness 8 mm. The shape and dimensions of this piece suggest that it could be the tip of a ploughshare, but the condition precludes positive identification (for Iron Age ploughshares, see Payne 1947). From F255.
- 5.23 Split pin. Overall length 48mm. Split pins were used to fasten objects to wood; cf those used to fasten ring handles to a wooden vessel found in a La Tène III grave at Welwyn Garden City (Stead 1967, fig 22). From F257.

Period IV

- 5.24 Rectangular buckle (traces of non-ferrous metal plating, possibly tin). This appears to be a medieval intrusion, cf an example from London (Ward-Perkins 1940, pl LXXXIX, 1). Hut C5, wall trench.
- 5.25 Knife with curved triangular blade and broad tang with one surviving rivet and a fragmentary rivet hole. Overall length 53 mm. Similar knives are known from Hunsbury, Northants (Fell 1936, pl IV, 2 = Northampton Museum D306/1956-7, also Northampton Museum D125/1957-8: the former still retains a bone handle but has only one rivet, the latter has two rivets) and Standlake, Oxon (Harding 1972, pl LXXVI, D). From F171.
- 5.26 Badly corroded fragmentary ring. Diameter 32mm; made from rod of circular cross-section 9 mm in diameter. From F171.
- 5.27 Very badly corroded rod of indeterminate cross-section. Maximum thickness 7mm, overall length 74mm. From F171.
- 5.28 Fragment of strip. Width 30mm, thickness 2-3 mm, overall length 48 mm. From F189.
- 5.29 Fragment of a sword scabbard made in the normal manner with the edges of the front plate turned over to secure the back plate. Made from plate 1 mm thick. Overall length 65 mm, width 38 mm. Such a scabbard would have belonged to a sword of Pig-gott's (1950) group II. Such swords were ultimately of La Tène origin but appear to have remained in use until the Roman Conquest. The majority of surviving scabbards for swords of this type are of iron. The scabbard is too narrow to have accommodated a sword of La Tène III type. From F277, a posthole of R7.
- 5.30 Fragmentary heavy plate of unknown function; 9 mm thick, overall length 37 mm, From F232.
- Bloomery iron from hut C2 is described below (p 115) by Dr R F Tylecote.

B Objects from Roman and later contexts: Periods V-VI

Only a selection of objects from Roman and later contexts were submitted for X-ray examination.

Period V

- 5.31 L-shaped lift-key with four teeth, one of which was broken in antiquity. Those with two teeth are the most common (see Manning, in Neal 1974, 166, no 388); for an example from Braintree comparable to this one see Manning, in Drury *et al* 1976, fig 16.16, pp 29-30. From the hollow way, F350.
- 5.32 A fragmentary iron band, 30mm wide, of which two fragments (of 14 found; total length c 550mm) are illustrated. One has a 6mm square rivet or nail hole; the others are plain, and the larger ones are curved, although it was not possible to determine the original diameter. Traces of wood adhering to the corroded iron were tentatively identified as being of Oak by Mrs C A Keepax of the Ancient Monuments Laboratory. The fragments were found in the sludge at the bottom of the well, F339, and are almost certainly part of a hoop from a wooden bucket, of the type described by Manning from Gadebridge Park, Hemel Hempstead (in Neal 1974, 187, and fig 79). Since no other fragments of the bucket were found, it seems likely that the hoop became detached during use.
- 5.33 Split spiked-loop: for the general type see Manning, in Neal 1974, 176-8, nos 529-41. From the ditch, F353.
- 5.34 The end of a flat bar c 40mm × 2mm. with a heavy, turned-over loop; almost certainly the top of a linch-pin with a spatulate head, of Manning's type 2b. as defined by him in Frere 1972, 174-5. This example is closely comparable to three examples there illustrated (nos 33-35, fig 64) from Verulamium. From the ditch, F353.

AM 729629: Pls VIII-X.

Note by Leo Biek

Collar or tube (fragment?) internal diameter c 45 mm, average thickness 5 mm (measurements from X-radiograph), estimated surviving length c 35 mm. This was received in the AM Laboratory in the form of a superficially solid grey clay ball, cracked in two places. X-radiography revealed a void in the shape of a collar, lined on both surfaces with radiopaque material. The lump was separated into three pieces along the cracks and was seen to represent an iron object in the final stage of severe and rapid corrosion, such as have been found in some special environments (Biek 1969). The mode of cracking made it possible to examine the inside lining of the void in places without damaging the specimen. The immediate surface of this lining consisted essentially of a cracked layer of black clayey material up to 1 mm thick, adhering to—but distinct from—a heterogeneous yet compact envelope of grey clay, in places sandy and stained with a variety of rusty colours, and of inconsistent thickness. Chemical analysis by John Evans, NE London Polytechnic, showed the black layer to contain carbonates and silicates but no sulphides; 4350ppm of iron and 43.5 ppm of manganese were present. The material is thus interpreted as iron oxide, with some manganese oxide, dispersed in a matrix of calcareous clay. The implications of these findings are discussed on p 8.

Other ironwork (not illustrated) comprised:

- (i) Forty-five much corroded iron nails, mostly 30-55mm long, from features 314 (1); 339 (16); 340 (4); 350 (18); 351 (3); 353 (2); and 365 (1).
- (ii) Two 12 mm long hobnails from F313 (see also 'Objects of leather', below).
- (iii) A fragment of a knife blade 27 mm wide, 2 mm thick (maximum), from F339.
- (iv) Fragments of plate *c* 2mm thick from F350 (3 fragments), 351, 353 (possibly part of a knife blade), 361, and 368 (bent to U-section, 90mm long, 30mm high).
- (v) Part of a ring *c* 12 mm in diameter, from F311.

Objects from the Roman Road cemetery, 1929 (see p 44 above)

- 5.35 Open hanging-lamp. The base is almost completely missing, and the sides have probably moved apart as the object has corroded; the terminal of the lamp stem is also missing. For a good example of the type (often erroneously called 'lampholders') see Manning (in Neal 1974, 158-61, no 346), where a long list of comparable examples is given. They occur in other, often relatively rich, to rich, graves in Essex, for example at Eastwood, Prittlewell and in the Bartlow Hills (Barrows III, V, VI, and VII) at Ashdon (*VCH Essex* 3, 1963, 127, 167, and 39-43 respectively).
- 5.36 Iron hanger, almost certainly associated with 5.35; the two rods are corroded together in the position shown. It is probable that the smaller rod formed the link between lamp and hanger: the development of the usual short linking swivel into a distinct rod, as here, is noted by Manning (in Neal 1974, 161) in examples from Newstead, the Bartlow Hills, and Norwich. The hook at the end of the main rod provided a means of suspension.

Period VI

The iron objects from Period VI features comprised 8 corroded and fragmentary nails, from features 303, 306, 328, 336, and 337, and a fragment of sheet or plate from F336. Most, if not all, of this material is probably Romano-British, and therefore residual in these contexts. See also no 5.24 above.

6 Objects of bone (Fig 62)

Period V

- 6.1 Handle, cut from a long bone near the joint. Decorated with two incised bands of cross-hatching and polished to a high gloss. From the well, F339, lower sludge filling: *c* AD 300.

Bone did not normally survive unless special conditions prevailed, as in this case (see p 9).

7 Glass

Period V (not figured)

- 7.1 Two fragments of greenish clear glass vessels, one 0.5 mm thick with fine air bubbles, the other 3.5 mm thick. Upper loam filling of the well. F339, *c* AD 300.
- 7.2 Similar fragment 3.5 mm thick. Sludge in bottom of well, F339, *c* AD 300.

- 7.3 Fragment of vessel of greenish clear glass, 1 mm thick, with fine air bubbles. Decorated with single narrow horizontal cordon. Also an abraded fragment of green translucent glass 5mm thick. From the filling of the hollow way 350, probably late 3rd-early 4th century.

Note by Leo Biek

It is interesting that the fragments are quite different in almost all respects—thickness; shape, size, and distribution of air bubbles; clarity; and colour hue. Although they come from three very different contexts they do have an important feature in common (apart from their colour chroma: a faintly greenish pale blue)—their state of preservation which is uniformly excellent, thus making these observations possible and resultant comments valid (see p 8); they lack any vestige of surface film or other sign of low-power microscopically visible weathering.

8 Objects of wood (Fig 61)

Two wooden objects, 8.1 and 8.2, recovered from the grey sludge in the bottom of the well, F339, are illustrated in Fig 61. They are essentially similar, being approximately spherical balls 90mm (3.5 inches) in diameter, with an upstanding lug pierced by a 12mm diameter hole. Each object is carved from a single block of wood, and in both cases the lug is broken across the hole, the weakest point. The wood has been identified as Oak by Mrs C A Keepax of the Ancient Monuments Laboratory; it was also noted that no features suggesting that the wood was replaced by inorganic materials were observed, and no penetration by iron into the wood was noticed (Keepax 1975; however, the Waltham material was not examined in this way).

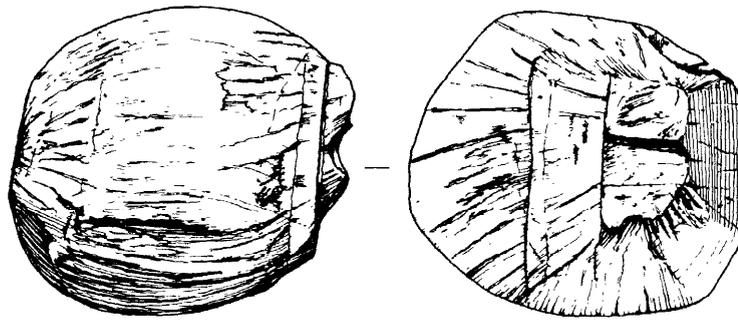
It is difficult to suggest a use for these objects connected with the well, or even in a domestic context, unless they were intended as decorative ornaments on wooden structures, the 'lug' in fact being a tenon, secured by a dowel through the hole. The hole, however, seems too close to the end of the lug for this to be a likely explanation; furthermore the fact that both lugs have broken seems to suggest that pressure was exerted from within the hole. The obvious conclusion—that they were attached to a rope passing through the hole—seems to suggest a function as floats, perhaps net floats. The River Chelmer is close at hand, and is suited to fishing with a net stretched across the stream. Such a net would need weights on the bottom and floats on the top. As a heavy wood, oak may seem an odd choice for floats, but most hardwoods become waterlogged much more slowly than softwoods.

9 Objects of leather (Fig 62)

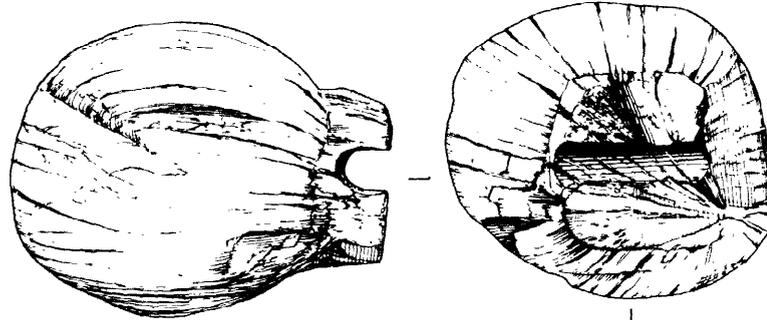
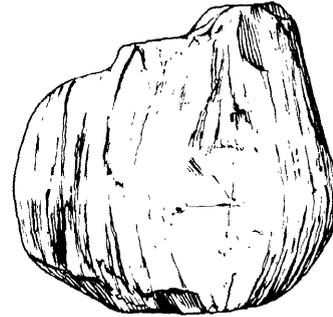
J H Thornton

The following leatherwork, illustrated in Fig 62, was found in the grey sludge forming the lower filling of the Period V well, F339, backfilled *c* AD 300:

- 9.1 Fragments of a pair (?) of nailed sandals. One specimen is the waist portion of a left foot laminated sole unit consisting of an *insole*, a *shank*, a *middle sole*, and an *outer sole*, heavily nailed, and also traces of a central thong to hold the sections together before nailing. The scatter of nail holes, and some nails *in situ*, suggests that the sandal was nailed more than once, possibly as a repair. The presence of two different types of nail (9.6) may support this suggestion. In some cases several nail heads have corroded together.



8·1



8·2

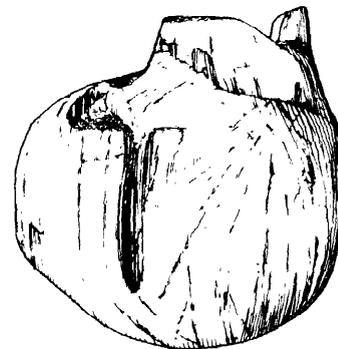


Fig 61 Little Waltham: objects of wood, 8.1, 8.2, probably net floats, scale 1:2

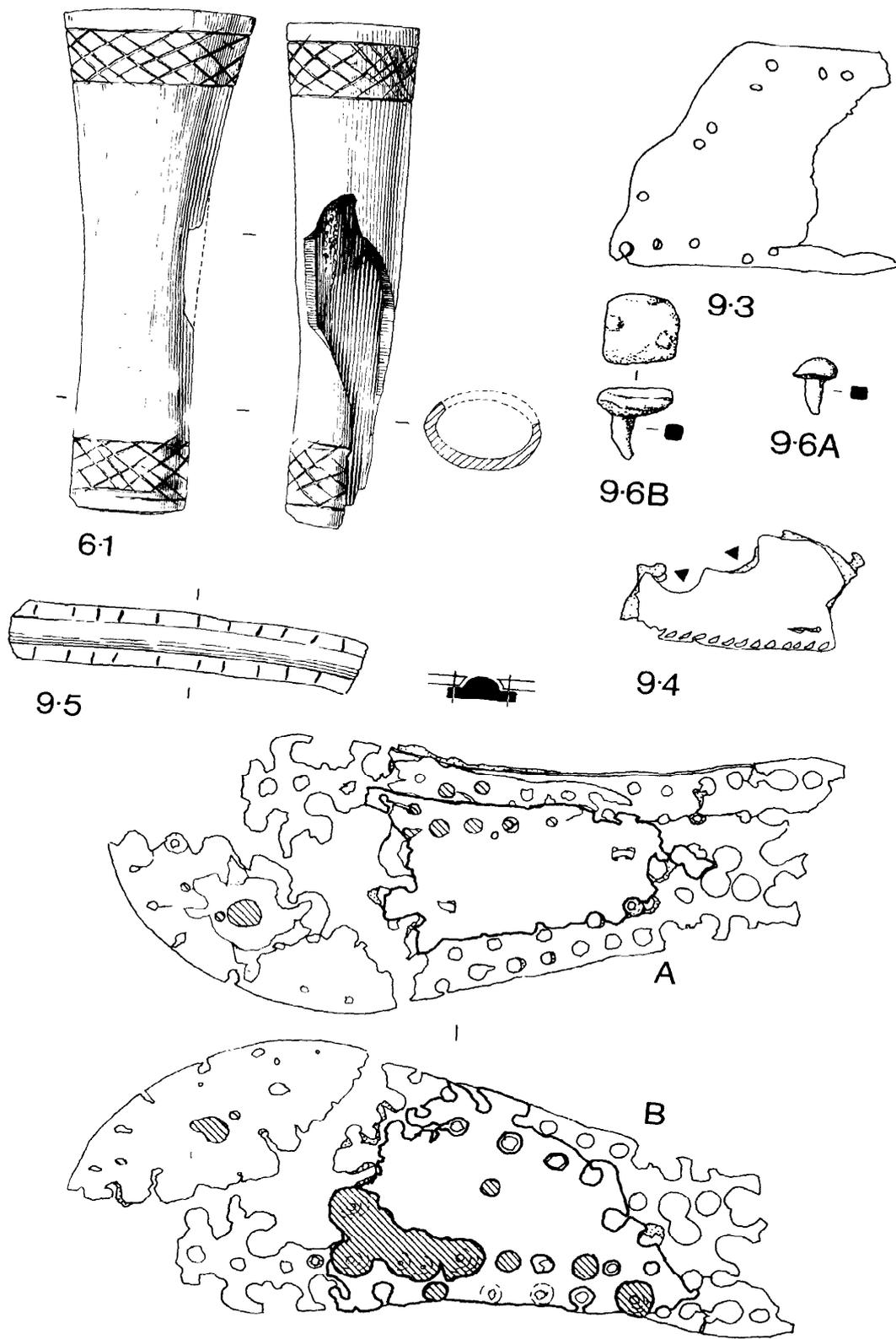


Fig 62 Little Waltham: bone handle, 6.1, scale 1:1: leather, 9.1-9.6, scale 1:2 except 9.5 (2:1) and 9.6 A,B (1:1)

Another section appears to be the outside toe portion of the same sandal, with small fragments of all the laminae held together in one place by a complete nail. The two major portions are shown in their correct relative positions in Fig 62. The insole grain side is shown in 9.1A, and the sole side is shown in 9.1B, corroded iron nails being hatched.

- 9.2 At least two other bottoming portions, with nail and thong holes. These may possibly be from the right foot of 9.1.
- 9.3 Various pieces of upper (?) with pairs of stitch or thong holes near the edges. It is not clear where these were placed; a representative piece is illustrated.
- 9.4 Two pieces of upper, possibly from the back, with stitch holes (4.5 mm between centres) along one edge and traces of what may be decorative cut-outs. The most substantial piece, with cut-outs arrowed, is illustrated.
- 9.5 Small pieces of beading with traces of fine stitching along the flanges (stitch length *c* 2.5 mm). The purpose of these is unknown, but they may have been inserted between adjacent edges of upper (see illustration with diagrammatic section). I have not previously seen this feature in Roman shoes.
- 9.6 Numerous small fragments and nails. Two types of nail are present, 9.6A with a small, domed head, and 9.6B with a large square head. Some show the typical bend resulting from the nails being hammered through the sole unit on to an iron last.

Note by Leo Biek

In several fragments, including 9.4, the grain surface was noted. The pattern was well enough preserved to permit comparison with reference micrographs (BLMRA 1975, fig 16B) which suggests that the material is calfskin.

10 The flint (Figs 63, 64)

Elizabeth Healey

Circumstances of discovery

The flint described in this report is of Mesolithic, Neolithic, and Bronze Age date. It was found during the excavations but from residual contexts (mainly the ploughsoil and Iron Age features, very little being recovered from the buried soil). Its fresh condition and the presence of spalls, cores, and flakes of similar flint, some joining, suggest that it had not been greatly disturbed by the later occupation on the site. Almost all of the flint was found on the brickearth on the lower valley slope (area A) rather than on the clay and gravel south of the spring line (area B) where only a thin scatter of flints was found. In area A the distribution of the flint reflects the features, except for a possible concentration on the south-west side of hut C2 and the four-post structure.

Raw material

The majority of the flint is translucent dark brown or grey in colour, but lighter greys and browns do occur and some opaque flint is present, including a pinkish white flint, eg the core 1. A light patina was observed on about 17% of the flints. Nearly 65% of the flakes and about the same proportion of the cores had areas of cortex on them, suggesting that small nodules were used. Flint occurs plentifully in the

gravels of the river bed and it seems likely that this provided a ready source of raw material. It appears to have been of good quality for flaking.

Typology

The flints recovered from Little Waltham may be described as follows:

Flakes and blades (unretouched)	592
Cores	28
Flake scrapers	11
Concave scrapers	3
Microliths	4
Gravers and spall	10
Micro-burins; intermediate forms	3
Axe and sharpening flakes	5
Truncated blades	11
Obliquely trimmed leaf-shaped points	5
Perforators	8
Serrated flakes	14
Flakes with small notches	9
Edge-dressed flakes and blades	10
Spurred implement	1
Tool with abraded end	1
Laurel-leaf (?)	1
Unclassifiable and miscellaneous retouch	26
Arrowheads	2
Bifacially worked point	1

The flint does not belong to an homogeneous industry so that it is not possible to comment on the composition of the assemblage, but some general observations on technique may be made.

All the industries are based on the production of flakes for retouch as tools; the axes are the only core tools present. The flakes are mainly squat (see Table 13); regular blades like 29 and 30 are comparatively rare. A number of flakes of similar flint, some joining, from a restricted area, and the presence of cores, indicate that flint was knapped on the site; however, the numbers are too few to suggest a flake/core ratio or to indicate the scale of activity in any period. The presence of a number of flakes (13) from hammerstones and a partly abraded core suggest that this was the most likely method of detaching flakes.

Two main distinctive types of secondary retouch were observed, which may reflect cultural differences: steep edge retouch, some of which is attributable to the Mesolithic horizon; and invasive scale-like flaking which is characteristic of the Bronze Age (Clark 1933a, 271). No ground or polished tools were present, and utilization of Smith's Class A (Smith 1965, 92-3) was virtually absent. Wear in the form of abraded areas was observed on five flakes (including 52, 56, and 57); the scrapers had lines of chipping on their edges which was probably occasioned in use (Rosenfeld 1971, 178).

Cores

The main types (after Clark *et al* 1960, 216)³⁹ of core present at Little Waltham are as follows:⁴⁰

Undeveloped single platform cores	6
Two platform cores	
(a) prismatic (1)	4
(b) others (2 and 3)	4
Multi-platform cores	5
Unclassifiable	9

Twenty of the cores have areas of cortex on them, four are patinated, and two are burnt. The unclassifiable cores

include pieces of shattered cores and other struck, but shapeless, lumps.

Most of the cores weigh 55 g or less and range between 15 g (2) and 115 g. The largest flake bed is usually between 30 mm and 40 mm in length (which is in agreement with the waste flakes) although five cores had larger beds and three smaller. Blade-like flake-scars were observed on eleven cores.

The striking platforms are usually formed from the scars of struck flakes, but in four instances a suitable platform has been provided by a thermally detached flake.

Two cores have been retouched as scrapers (eg 2); seven other cores and three core-rejuvenation flakes have trimmed edges, but this was probably to regularize the core edge rather than to provide a scraping edge. Another core has a heavily abraded area on one face, perhaps resulting from use as a hammerstone.

AFFINITIES

A Mesolithic date is suggested by the blade cores, 1, and the micro-blade core, 2; the flat, roughly discoidal core, 3, is like examples from Grooved Ware sites at Lion Point, C l'acton (Wainwright, in Longworth *et al* 1971, 121, and pl XL, nos 4 and 6), but both types also occur in earlier Neolithic industries (see, for example, Windmill Hill, Smith 1965, 87 and figs 1, 6, and 8).

Illustrated material (Fig 63.1-63.3)

63.1 Prismatic blade core. Edge of one platform neatened. Opaque grey-white flint with pink tinge. Location: subsoil within hut C4.

63.2 Micro-blade core. Two platforms, the edge of one has a concave profile and has been retouched as a scraper (angle of retouch 70°). Dark brown flint. Location: hut C15, wall trench.

63.3 Flat (?prepared) core, roughly discoidal in shape. Grey flint; some cortex (unrolled). Location: subsoil, south-west of hut C2.

Core-rejuvenation flakes⁴¹

Four core-rejuvenation flakes of Mesolithic character were present; three had been struck along the edge of an existing platform and one across the platform. Three of the original cores had scraping edges. Two other flakes removed a second platform from a Class B2 core. Three flakes, deliberately struck to remove awkward pieces on the core face, were recognized and others may be present.

TABLE 13 The bivariate frequency distribution of dimensions of intact flakes

	Length (mm)								Total
	10	20	30	40	50	60	70	80	
10	—	7	5	3	2	—	—	—	17
20	1	24	68	48	20	2	—	—	163
30	—	20	69	57	28	10	4	1	189
40	—	1	22	12	9	5	—	—	49
50	—	—	4	7	3	1	—	—	15
60	—	—	—	1	—	1	—	—	2
70	—	—	—	1	—	—	1	—	2
Total	1	52	168	129	62	19	5	1	437

Flakes and blades

Most of the struck flint from Little Waltham comprises unretouched and apparently unutilized flakes, which presumably are the by-products of flint knapping. Their dimensions are given in Table 13.

It is clear from this table that most (over two-thirds) of the flakes were short and broad, only a very small proportion having blade-like proportions (ie with a breadth/length ratio of 2.5 or under).

Scrapers

The metrical details of the intact scrapers are given in Table 14.

TABLE 14 Flint scrapers

Fig ref	Classification (after Clark <i>et al</i> 1960) ⁴²	Dimensions of flake			Angle of retouch
		length mm	breadth mm	thickness mm	
4	Ai	62	30	11	60°-70°
6	Ai	39	23	6	50°-60°
5	Ai	36	20	9	70°-80°
7	Aii	26	33	9	70°-80°
11	C	42	40	16	60°-70°
10	C	31	29	13	60°-70°
9	C(?)	44	40	14	90°+
—	C	38	(30)	9	90°
13	D	34	24	6	60°-70°
12	thermal flake	79	51	18	60°-70°
8	thumb nail	17	19	4	40°-50°

Cortex was present on six scrapers and one, 6, had been burnt. No heavily abraded areas were present, but wear in the form of lines of chipping caused by the removal of rows of hinged flakelets (Rosenfeld 1971, 178) was present in every instance except 6.

The scrapers are of course numerically too few for any conclusions to be drawn from the above data, but if considered in conjunction with flaking techniques and shape of the scraping edge the following groups emerge:

- A End scrapers with light edge retouch. The shape of the scraper edge tends to be flattened (4, 5, and 6). They recall the straight end scrapers from Boyers Pit, Denham (Lacaille 1963, 169 fig 10 and may be Mesolithic in date.
- B Scrapers with heavier retouch usually on the ends and sides of the flake (one end scraper has type B(i) retouch). The shape of the scraping-edge is rounded. (i) With steep retouch, 9. Perhaps early Neolithic in date; a series of thick, steeply retouched scrapers were found at Windmill Hill (Smith 1965, 95-6). (ii) With invasive scale flaking, 10, 11, and 12. These may be of Bronze Age date (see Clark 1933, 27 1-2).
- C Scraper on a small flake with flattish edge retouch, 8. This is perhaps a crude thumb nail scraper and may be from a Beaker context (Bradley 1970, 35 7-8; Wainwright 1972, 62).

How much these groupings reflect chronological or cultural change (Smith 1965, 95, 107; Wainwright 1972, 52, 61-2) and how much they reflect functional differences (Pike & Bradley 1974, 29) it is not at present clear; the two are, of course, not necessarily mutually exclusive.

Illustrated material (Figs 63.4-63.13)

63.4 Scraping-edge on the distal end of a long flake with a keeled cross-section. The scraping-edge is oblique and has a straight or flattened contour. The retouch is fairly steep; there are lines of



Fig 63 Little Waltham: flints, 1-28, scale 1:2

chipping on the edge. The margins of the flake are damaged, probably by utilization. Dark brown-grey flint, small amount of cortex. Location: hut C14, wall trench.

- 63.5 Scraping-edge on the distal end of a flake. The scraping-edge is oblique and has a flattened or straight contour, only part of the available length being retouched. The depth varies with the thickness of the flake. The angle of retouch is steep. The pattern of retouch is semi-convergent and there is some step fracturing on edge. The margins of the flake show signs of utilization or light retouch, partly inversely in a concave area near the scraping-edge. Light brown flint, old heavily patinated scar on right edge. Location: unstratified, northern part of area A.
- 63.6 Scraping-edge on the distal end of a flake. Its contour is flattened and irregular. The angle of retouch is fairly steep but the retouch is light and rather irregular. The pattern of retouch is non-convergent. The flake has been burnt. Location: F251 (Neolithic hearth).
- 63.7 Scraping-edge on a flake with scraper like profile, but having non-specialized steep edge retouch. Much step-fracturing on edge. Dark brown-grey flint, small area of cortex. Location: unstratified, southern part of area A.
- 63.8 Scraping-edge on the butt end of a small flake. The retouch which forms the scraping-edge has removed the bulb of percussion. It has a rounded contour with shallow invasive retouch of semi-convergent pattern. The distal end has been modified by light retouch and was perhaps also intended for use as a scraper. Dark brown-grey flint. Location: C16, wall trench.
- 63.9 Scraping-edge on the distal end and sides of a thick, squat flake. The scraping edge (partially inverse) uses about two-thirds of the circumference of the flake. The contour is rounded. The direct retouch is steep, but not invasive (contrast 8 and 9 above); on the ventral face, it is shallow and invasive modifying the thickness of the flake. There is step-fracturing or chipping on the edge which is heavy on projecting areas. Dark brown-grey flint. Unlocated.
- 63.10 Scraping-edge on the distal end and sides of a thick small squat flake. The scraping-edge occupies about three-quarters of the circumference of the flake. The contour is slightly irregular but basically rounded. The retouch is mostly scale flaking, its angle varying with the thickness of the flake; it is steepest at the distal end and flatter and invasive on sides. There is much step-fracturing on the edge, and a small area of damage or spalling on the ventral face. Dark grey flint. Location: unstratified, northern part of area A.
- 63.11 Scraping edge on the distal end and sides of a thick squat flake. The scraping edge occupies about half of the circumference of the flake and has a regular rounded contour. the retouch is scale-like and invasive, thus reducing the thickness of the flake, making the angle of retouch shallower than the original profile of the flake would have allowed. Step-fracturing on projections. The left margin at the butt end has flat inverse retouch. Dark brown-grey flint with small area of cortex. Location: water main trench, area A.
- 63.12 Scraping edge on a large, irregularly shaped,

thermally fractured flake. The scraping edge has a rounded contour, but the longitudinal profile is less markedly concave than usual. The working is invasive and there is step-fracturing on the edge. Dark grey-brown flint; small area of cortex. Location: hut C6, wall trench.

- 63.13 Scraping-edge on the right side of a small flake with a hinge fracture. The contour is slightly rounded. The angle of retouch is steeper towards the butt end, and heavier in this area. There are lines of chipping on the edge. Dark grey mottled flint; small area of cortex. Location: F349.

Concave scrapers

Three flakes with relatively shallow concave area were present, including 14 and 15. They have all been steeply retouched.

Illustrated material (Figs 63.14-63.15)

- 63.14 Concave scraping-edge on the butt end of a thick flake. The butt has been modified by steep heavy retouch to form a wide concave area. The bulb of percussion has also been modified. Dark grey flint with old patinated scar. Location: F349.
- 63.15 Concave scraping-edge on a truncated flake. The business edge has been inversely worked with steep retouch and the lower part of this edge shows irregular spalling. The opposite edge has been partially and somewhat irregularly retouched. Light grey flint corticed. Location: hut C13, wall trench.

Microliths and related forms

The following varieties are present:

Obliquely blunted points (16 and 18)	2
Fragment of a broken microlith (17)	1
Sub-triangular form (19)	1

One obliquely blunted point, 16, belongs to Clark's (1933b) Class A: the other, 18, has been broken at one end but is probably Class B. The fragment may be the tip of an obliquely blunted point. The sub-triangle is made on a bladelet and still retains a portion of its bulb of percussion; it has been inversely worked.

Although occasional microliths and other types usually found in Mesolithic industries have been recorded from otherwise Neolithic contexts (eg Hurst Fen, Clark *et al* 1960, 223-5; Broome Heath, Wainwright 1972, 68) the range of Mesolithic types from Little Waltham would indicate that these microliths belong to the Mesolithic horizon. The sub-triangular form suggests a later Mesolithic date.

Illustrated material (Fig 63.16-63.19)

- 63.16 Obliquely blunted point (Clark 1933 b, Class A) made on a small truncated bladelet, patinated. Location: F250 (Neolithic).
- 63.17 Fragment of a microlith, perhaps the top of an obliquely blunted point. Brown flint. Location: area A, region of R4.
- 63.18 Obliquely blunted point with blunting down all of one edge of a blade (Clark, Class B), (broken at butt end). The retouch is deeper and steeper towards the tip where it shows considerable crushing and undercutting on the edge. There is spalling on the opposite edge, possibly indicative of utilization. Light brown-grey mottled flint. Location: F186.
- 63.19 Microlith of sub-triangular form (inversely retouched on two edges. (? unfinished scalene trian-

gle; Clark, Class D). Part of the bulb of percussion remains, indicating that it was made from a micro-blade rather than by the micro-burin technique. Brown flint. Location: subsoil, SW of hut C2.

Gravers

The gravers or burins are mostly crude specimens and some are not very convincing. The better ones have been illustrated. One core, 21, also has a graving edge. One (unillustrated) has trimming on the opposite edge. A single burin spall was found. These are also likely to be part of the Mesolithic horizon.

Illustrated material (Figs 63.20-63.23)

- 63.20 Graving edge on a large flake with sporadic edge retouch, partially alternate and of varying intensity. Dark brown-grey flint, small area of cortex on platform. Location: hut C8, wall trench.
- 63.21 Core graver. Dark grey flint with rolled cortex. Location: hut C12, wall trench.
- 63.22 Graver. a truncated scar on the right edge (as illustrated) may have been an earlier graving edge. Light brown flint. Location: subsoil. immediately east of F250.
- 63.23 Graving edge on a flake. the distal end of which has been truncated. The burin blow has been struck using the truncated end as a platform. Grey-brown lightly patinated flint. Location: hut C5, wall trench.

Micro-burins: intermediate forms

Although no micro-burins were present in the assemblage, 3 blades, including 24 and 25, with lateral notches may be intermediate or unsnapped forms; a fourth thicker blade with a notch near the butt end perhaps also belongs to this category and 34, a truncated blade with a small lateral notch near the butt end, might also be an unsnapped micro-burin. These presumably belong to the Mesolithic horizon on the site.

Illustrated material (Figs 63.24-63.25)

- 63.24 Small steeply retouched lateral notch on an irregular flake (? unsnapped micro-burin). There are indications of utilization on the edge of the flake opposite the notch. Dark brown-grey flint. Location: hut C9, wall trench.
- 63.25 Small lateral inversely worked notch near the butt end of a blade, part of this edge has also been blunted inversely (? unsnapped micro-burin). The rest of the edge has been steeply retouched before the flake was detached from the core. Grey mottled flint, trace of cortex. Location: unstratified, central third of area A.

Axes and adzes

Five axes or adzes are represented by the blade end of a broken adze and by four sharpening and thinning flakes. No complete specimen was found. The adze, 28, has been sharpened by a tranchet blow. It appears to have had a quadrangular or lozenge cross-section. but insufficient of the shaft remains to be certain. Two sharpening flakes, including 26, have also been struck from tranchet axes of about the same size. There is also a large flake. probably struck from an axe, perhaps in the preliminary stages of manufacture. It has sporadic spalling on the edges and one short length lightly retouched. The fifth axe is represented by a keeled flake, 27, apparently struck during the manufacture of the axe which has been classified as a thinning flake.

Illustrated material (Figs 63.26-63.28)

- 63.26 Axe sharpening flake. Light brown mottled flint. Location: unstratified, southern part of area A.
- 63.27 Axe thinning flake (?). Grey flint. Location: subsoil. south-west of hut C2.
- 63.28 Blade of a tranchet adze. The adze has been broken in antiquity. The median ridge has been flattened by the flaking at the blade end, but is more prominent near the break; the adze was probably originally of lozenge cross-section. Patinated, including the break. Location: subsoil, immediately east of F250.

Truncated blades and associated forms

In this category there are seven blades with the distal end truncated obliquely by steep secondary working, including 29, 30, 31, and 32 (inversely worked); another one, 33, has its distal end transversely truncated and the retouched area worn smooth. There are also three less regular blades with their butt ends truncated and trimmed, including 34 and 35; 35 has inverse flat flaking and 34 has a lateral notch and may be an unsnapped micro-burin. Truncated blades are of course well known in Mesolithic contexts.

Illustrated material (Figs 64.29-64.35)

- 64.29 Truncated blade. The distal end of the blade has been truncated obliquely by steep retouch, producing a slightly concave edge. There is irregular spalling on the edges of the blade. Brown flint with light grey-white patina. Location: hut C14, wall trench.
- 64.30 Truncated blade. The distal end of the blade has been obliquely truncated by steep nibbling retouch. There is spalling on the right margin of the blade. Brown flint; cortex on one edge. Location: area B, unstratified.
- 64.31 Truncated blade (irregular shape) perhaps like 30. The distal end has been obliquely truncated by steep but minimal retouch. There are indications of utilization on the left edge towards the point and irregular spalling on the right edge. Orange-brown flint. Location: area B. unstratified.
- 64.32 Truncated blade. A small irregular blade has had its distal end obliquely truncated by flattish inverse retouch. Light grey-white flint. Location: hut C2, wall trench, L1.
- 64.33 Transversely truncated flake with nibbling edge retouch across the distal end. This has been worn almost smooth in parts. Light brown flint, cortex on one edge. Location: hut C2, wall trench.
- 64.34 Truncated blade. The butt end of the blade has been truncated and inversely worked by relatively heavy steep edge retouch. It also has a small inversely worked semi-circular notch, and a short length of edge retouch on the side. Light brown flint. Location : F67.
- 64.35 (?) Truncated flake. Keeled fake with light retouch on part of the right edge and slight (? accidental) retouch on the point. The butt end has been truncated by flattish invasive retouch. The upper part of the left edge also shows sporadic spalling. Brown grey flint. Location: unstratified. northern part of area A.

Obliquely trimmed leaf-shaped points

Three leaf-shaped flakes like 37 and 38, one blade, 36, and a squat flake, 39, have been regularly and steeply blunted along one of the oblique edges on its upper part. These are

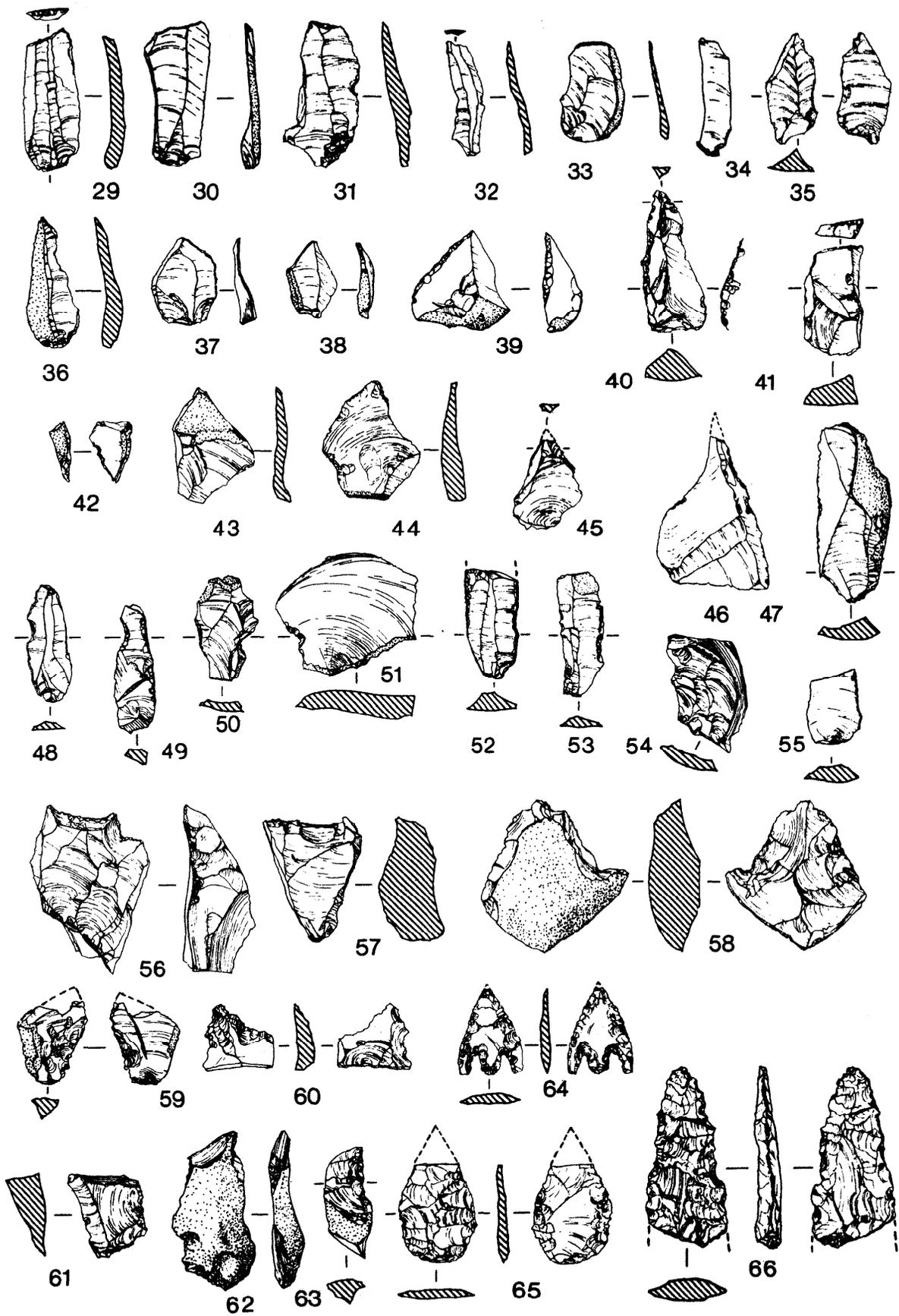


Fig 64 Little Waltham: flints, 29-66, scale 1:2

probably related to the obliquely truncated blades. Perhaps of Mesolithic date.

Illustrated material (Figs 64.3 6-64.39)

- 64.36 Blade obliquely blunted. Steep minimal edge retouch on the upper part of an elongated leaf-shaped blade. Light brown flint, cortex all along one edge. Location: subsoil within R2.
- 64.37 Leaf-shaped flake, obliquely blunted. The upper oblique part of the right edge has regular steep nibbling edge retouch. Brown flint. Location: F253.
- 64.38 Small leaf-shaped flake, obliquely blunted. The upper oblique part of the left edge shows steep but minimal edge retouch. Light grey-brown flint, cortex on side. Location: hut C2, wall trench.
- 64.39 Thick squat flake, obliquely blunted. The oblique left margin has been steeply retouched to the point. Dark grey flint, cortex on the butt end. Location: F255.

Perforators

This is a heterogeneous group of eight flakes, the working end of which has been formed by retouching the naturally pointed contour of the flake. Only one point, 43, has been offset by notches. The degree of retouch varies from steep heavy retouch like 40 and 44, to minimal edge retouch, 41. The points are normally short and wide, but there are two longer points, 45 and 46. Additional edge retouch was noted on three flakes, 40, 44, and 46, and two of these also have small semi-circular notches. This group of points is largely undiagnostic: short points with the minimum of retouch may belong to an earlier Neolithic context (see Windmill Hill, Smith 1965, 93) or they may be Mesolithic (eg Thatcham, Wymer 1962, 348).

Illustrated material (Figs 64.40-64.46)

- 64.40 Perforator on a flake of keeled cross-section. The left margin has been steeply retouched, the right edge shows some flat inverse retouch. The point is formed by retouch along the natural contours of the flake, the keeled ridge showing more extensive retouch than that on the left edge which amounts to little more than the removal of small squills. Dark grey flint. Location: F243.
- 64.41 Perforator on a thick flake. The point is triangular sectioned and has minimal steep nibbling retouch on three edges. The point is abraded. Dark brown flint. Location: area B, unstratified.
- 64.42 Perforator on a truncated flake. The upper part of the left edge shows steep retouch which meets the light steep retouch on the right edge, to form a sharp point. Dark grey flint, cortex on edge. Location: hut C11, wall trench.
- 64.43 Perforator on a squat irregularly-shaped flake with cortex on the distal end. The point has been offset by two very small notches on either side of it and the left margin has been steeply retouched. Dark grey flint, corticed. Location: F303.
- 64.44 Perforator. An irregularly shaped flake has been steeply and inversely retouched on a corner to form a point, which is abraded. There is a lateral semi-circular notch and sporadic edge retouch on the margins of the flake. Brown grey flint. Location: unstratified, southern part of area A.
- 64.45 Perforator with a long point on a leaf-shaped flake. The point is broken, but originally the light steep edge retouch on the remaining part continued for its length. Brown flint. Location: hut C16, north butt end of wall trench.

- 64.46 Perforator with a long point. The point (broken) has steep moderately heavy edge retouch. The margins also have sporadic retouch including a small semi-circular notch. Grey flint. Location: hut C5, wall trench.

Serrated flakes

Minute denticulations formed by the removal of a single spall on either side of a tooth were observed on fourteen flakes. It is in fact likely that more flakes were serrated, but that the serrations have been worn down by use so that the edge is then difficult to distinguish from ordinary utilization. The more distinct examples have about eight or nine teeth per cm. The serrated edges may occur on a variety of blanks; at Little Waltham ten blade-like flakes have serrations on straight edges, of which three have been truncated but not retouched. Two irregular flakes have serrations on concave edges, and one irregular core-rejuvenation flake has serrations on a straight edge. Gloss was observed on the edge of two flakes. Serrated flakes are well documented in Mesolithic and Neolithic contexts, and there is some evidence to suggest that the serrations become coarser later in the Neolithic period (Smith 1965, 91, 239).

Illustrated material (Fig 64.47)

- 64.47 Serrated edge on a large keeled flake, perhaps struck from a hammerstone (incipient cones of percussion on side and butt). There is an average of about eight teeth per cm on the serrated edge. The other edge is corticed. Grey-brown flint. Location: hut C2, wall trench.

Notched flakes

Small semicircular notches (all lateral) were observed on nine flakes and blades, and three perforators. The notches are between 4 mm and 10mm wide (from shoulder to shoulder) and 1 mm and 2.5 mm deep. The edge opposite the notch has been retouched in four instances, including 48, 49, and 50; 48 and 49 have been more extensively retouched. These notched flakes are unlike the intermediate or unsnapped form of micro-burin (see above) in that they usually occur on thick irregular flakes rather than blades. But regular blades like 48 suggest that there may be some overlap. They may be a form of spoke-shave and are perhaps related to the larger more robust concave scrapers. 14 and 15.

In date it has been shown that they range from the Mesolithic right through the Neolithic (Ozanne, in Alexander *et al* 1960, 295) and in such a context as this must be treated as undiagnostic.

Illustrated material (Figs 64.48-64.51)

- 64.48 Small lateral notch on the side of a blade (? perhaps an unsnapped micro-burin). The notch is shallow and has been moderately steeply retouched and slightly undercut. The other edges show light retouch. Light brown-grey flint. Unstratified.
- 64.49 Lateral notch on a flake with a keeled cross-section. The notch has been formed by steep inverse retouch, and there is flat inverse retouch on the edge opposite the notch. Brown flint, small area of cortex. Location: F336.
- 64.50 Lateral notch on a flake. The notch has been formed by a single blow. The edge opposite the notch has light alternately executed retouch. Dark brown flint, some cortex. Location: hut C8, wall trench.

- 64.51 Small lateral notch on a large squat flake. The notch is towards the butt end and has been steeply and inversely retouched. Dark grey flint, some cortex. Location: hut C5, wall trench, L1.

Edge dressed flakes and blades

Ten flakes and blades had varying degrees of retouch along one or both edges. Five of these have neat, light trimming on the one edge, including 52, 54, 55, and four, including 53, have heavier, less regular retouch along part of a long edge. Four are abraded on this edge (including 52 and 54), and two of these, including 52, have worn butt ends, immediately below the retouched edge.

Illustrated material (Figs 64.5 2-64.55)

- 64.52 Edge dressed flake (truncated) with worn edges (indicated by heavy black line). Both margins have steep edge retouch; on the upper part this appears to have been invasive, the scars intersecting with the main flake beds on the back of the flake but the blade has been truncated at this point. Dark grey flint. Location: unstratified within southern part of Period IV enclosure.
- 64.53 Blade with medium steep edge retouch on the right margin and flat invasive scale flaking on the left edge near the butt end (?unfinished). Orange flint. Location: F250 (Neolithic).
- 64.54 Flake with a bevelled edge (truncated) which has been worn. The ventral face shows flat flaking which removes the bulb of percussion. Grey-brown flint. Location: hut C10, wall trench.
- 64.55 Edge dressed blade (truncated) inversely retouched with light, regular edge retouch. Dark grey-brown flint. Location: unstratified, northern part of area A.

Spurred implement

This artefact is characterized by a short projection or spur on an edge with scaper-like retouch. Such implements are known from late Neolithic contexts, for example, the Upper Levels at Windmill Hill and from West Kennet Avenue (Smith 1965, 105). The Little Waltham specimen, 56, is larger and more pointed than most of the examples quoted and has a double spur. Other, possibly analogous, forms were found in an apparently Mesolithic context at Abinger, Surrey (Leakey 1951, fig 7, esp nos 17 and 18), where they are described with the scrapers.

Illustrated material

- Fig 64.56 Spurred implement on a large core-rejuvenation flake with a prominent bulb of percussion. Two points or spurs are offset by heavy steep scaper-like retouch on side and on concave edges. Mottled grey flint. Location: unstratified, central part of area A.

Tool with abraded end

A small nodule of flint has one rounded end abraded and worn and the opposite end steeply retouched, 57. The abraded end is like that of a fabricator, but in other respects the artefact is atypical, although it is somewhat like one from Windmill Hill (Smith 1965, fig 39, 93, F21).

Illustrated material

- Fig 64.57 Tool with abraded end. Small nodule with round end abraded and rubbed. The opposite end has been heavily and steeply retouched forming slightly concave profile. Mottled grey flint. Location: hut C7, wall trench.

Laurel-leaf (?)

A crude triangular-shaped artefact with flat invasive retouch, 58, may be of similar type to some of the laurel-leaf rough-outs from Hurst Fen (Clark *et al* 1960, 223), and as such would be of Neolithic date.

Illustrated material

- Fig 64.58 Laurel-leaf (?). A thermally detached corticed flake with flat, invasive retouch from the edges inwards meeting at a ridge, perhaps a laurel-leaf rough-out. Mottled brown grey flint, cortex on back. Location: hut C14, wall trench.

Unclassifiable retouch

This category comprises five retouched flakes which have been damaged beyond reconstruction- They include a possible point, 59, which has bifacial flaking on one edge; a flake with flat invasive retouch, and the other three have been truncated across a regularly retouched edge.

Illustrated material

- Fig 64.59 Core-rejuvenation flake, damaged (? struck from a core-scaper), edge bifacially retouched with flat invasive flaking, and with steep nibbling edge retouch on distal end. Dark grey flint. Location: F256.

Miscellaneous retouch

This category comprises 21 flakes, which have been retouched but which cannot be assigned to another category. Some, at least, may be chance forms recalling artefacts and seem to have been retouched to fulfil an immediate purpose. On this assumption they have been subdivided as follows:

Retouch on a scaper-like edge (61)	6
Tanged (62)	1
Thermal flake with retouch	1
(?) Graver-like edge	1
Edge retouch	8
Retouched butt	1
Others (63 and 60)	2

In addition there is a large primary flake (96mm × 40mm) which has been rolled, but which may also have some edge retouch.

Illustrated material (Figs 64.60-64.63)

- 64.60 Point (?) fragment of an irregular flake with crude scale flaking offsetting a point. Grey flint. Location: hut C5, wall trench.
- 64.61 Irregular retouch on the left side of a core trimming flake, perhaps intended as a scraping edge as it has a concave profile. Dark brown-grey flint. Location: F29, hut C2, wall trench.
- 64.62 Primary flake with retouched point and oblique edge steeply retouched near butt forming a crude tang. Similar blunting also occurs on the margin opposite. There is some flat retouch on the bulbar face. The pointed end has a small notch immediately below and shows minimal edge retouch. Brown flint. Location: F232.
- 64.63 Fragment of a flake with steep keeled section with steep heavy and invasive retouch on truncated edge forming a concave area. Perhaps a hollow scraper. Grey flint. Location: F263.

Arrowheads

Two arrowheads, one leaf-shaped and one barbed-and-tanged, were recovered. The leaf-shaped arrowhead, 64, is of birch leaf form and has its maximum width below 2/5ths of its length. This is the most usual form of leaf-shaped

arrowhead associated with Neolithic plain bowl cultures (Smith 1965, 100; Clark *et al* 1960, 220-1) but an unstratified example is as likely to be Bronze Age as of Neolithic date (Green 1974, 106, n36). The barbed-and-tanged arrowhead, 65, would, on typological grounds, seem to belong to a Wessex/Middle Rhine and Southern Beaker context (Clarke 1970,98), although it should be noted that ceramic associations of the various forms of arrowhead are by no means exclusive.

Illustrated material (Figs 64.64-64.65)

64.64 Leaf-shaped arrowhead (broken at tip) with a rounded shoulder at about 1/3 length. Side 1 has been flaked all over with parallel scars meeting and partially interlocking at the centre. Regular squilling on base. Side 2 has been less consistently retouched with large areas of the blank unworked; the flaking is flat and confined to the edges. Light brown flint. Location: subsoil within hut C13.

64.65 Barbed-and-tanged arrowhead of mitriform outline, the barbs and tang being of equal length. The barbs are curved with approximately square ends. The arrowhead has flat invasive flaking which is confined to the edge of both faces. The notches have been steeply retouched. Dark grey-brown flint. Location: subsoil, area of huts C1 and C2.

Bifacially worked point

This artefact is characterized by pressure or flat scale flaking on both faces of a narrow leaf-shaped flake with a lenticular cross-section. The context of this type is not clear but the Little Waltham example, 66, appears similar to 'fabricators' from an early Neolithic context at Broome Heath (Wainwright 1972, F104), from Maiden Castle (Wheeler 1943, fig 40, no 19), and from Hurst Fen (Clark *et al* 1960, 225, F53), and possibly to a perhaps later Neolithic 'fabricator' from a Grooved Ware site at Dorchester (Atkinson *et al* 1951, no 199) or are perhaps like the bifacially flaked knives from Scottish late Neolithic tombs, eg Tormore (Henshall 1972, 305, Tormore I (Arn 4, no 7).

Illustrated material

Fig 64.66 Bifacially worked point of lenticular cross-section damaged by heat and broken at the butt end. Face 1 (as illustrated) has been flaked all over with flat scale flaking, the scars tending to interlock at the centre, but some step-fracturing remains. The other face is less extensively worked. The edges are irregular (? damaged); some neatening of the edges especially at the point. Dark grey flint. Location: unstratified; central section of area A.

Summary and conclusions

The flint assemblage from Little Waltham has certain characteristics that indicate elements of Mesolithic, Neolithic, and Bronze Age dates. The Mesolithic tradition is predominant; artefacts include the microliths, the graver, the axe and axe sharpening flakes, and the truncated blade; the cores with long narrow scars may also be Mesolithic, and the possibility that some of the straight-ended scrapers are Mesolithic cannot be ruled out. The light patina, observed on some of the typically Mesolithic material, was absent from any identifiably later material, and this suggests that the patinated material may be Mesolithic in date. The Neolithic element is much less certain; an earlier

horizon is indicated by the steeply retouched scraper, the possible laurel-leaf and perhaps the perforators and leaf-shaped arrowhead, although this may be of Bronze Age date (see above). The later Neolithic and Bronze Age elements include the scrapers with scale flaking and the spurred implement; the barbed-and-tanged arrowhead is probably of Beaker date.

The absence of a specifically Neolithic flint industry associated with the Neolithic pottery (Fig 36) is unexpected. The general distribution of flint showed no particular concentration in this area, and the diagnostic flint found with the pottery (in features 250 and 251) is of Mesolithic tradition. It includes a scraper, 6 (F251), a microlith, 16 (F250), a graver, 22 (immediately east of F250), and the adze, 28 (as 22). The majority of the flint in F251 had been burnt so that it appears to have been disturbed by the Neolithic hearth. A fuller discussion of the contexts of the Little Waltham assemblages will be given in a forthcoming report on the flints from recent excavations in Chelmsford.

11 Objects of stone (Fig 65)

Identifications by *F W Anderson*

A Saddle querns and rubbers—Period II

- 11.1 Large fragment of a saddle quern in pale grey flint, probably an erratic, possibly originating from Yorkshire. The working face is heavily abraded and there is a little abrasion on the opposite face, though this seems to have quickly spalled. From the south butt end of the wall trench, hut C6.
- 11.2 (unfigured) Large fragment, 27cm × 10cm, 10cm thick, of a saddle quern in flint as no 1; the working face is heavily abraded. From the south butt end of the wall trench, hut C8A.
- 11.3 Fragment of a saddle quern in a hard sandstone, possibly Jurassic; could be an erratic. Seven other non-joining fragments of the same quern, which must have been at least 30cm wide, were found in the packing of PH 194.
- 11.4 Fragment of a saddle quern in a very hard greenish-grey compacted gritstone, possibly Lower Palaeozoic; could be an erratic. One slightly concave face is abraded. From pit 163A.
- 11.5 (unfigured) Fragment of a quern in stone as no 4. One face, c 9cm × 12cm, has been abraded flat: the fragment is a maximum of 6cm thick. From the wall trench, hut C7.
- 11.6 (unfigured) Quern fragment. c 2.5cm thick, in a very hard, dark brown compact gritstone, possibly Lower Palaeozoic; could be an erratic. One slightly convex face. c 9.5cm × 4cm. is rubbed smooth. From pit 82.
- 11.7 (unfigured) Quern fragment, c 8 cm × 9 cm. 5 cm thick, in ferruginous pink sandstone. possibly Carboniferous; could be an erratic. From the wall trench. hut C16.
- 11.8 (unfigured) Quern fragment. c 2.5 cm × 5cm. 4 cm thick, in calcareous sandstone, possibly Jurassic; could be an erratic. From the wall trench of hut C 7.
- 11.9 Probable rubber, broken, in stone as no 7; found with no 3 in PH 194. If, as seems likely, rubbers tended to be similar large erratic pebbles, it is not surprising that few could be recognized as such. The example appears to have been abraded on the

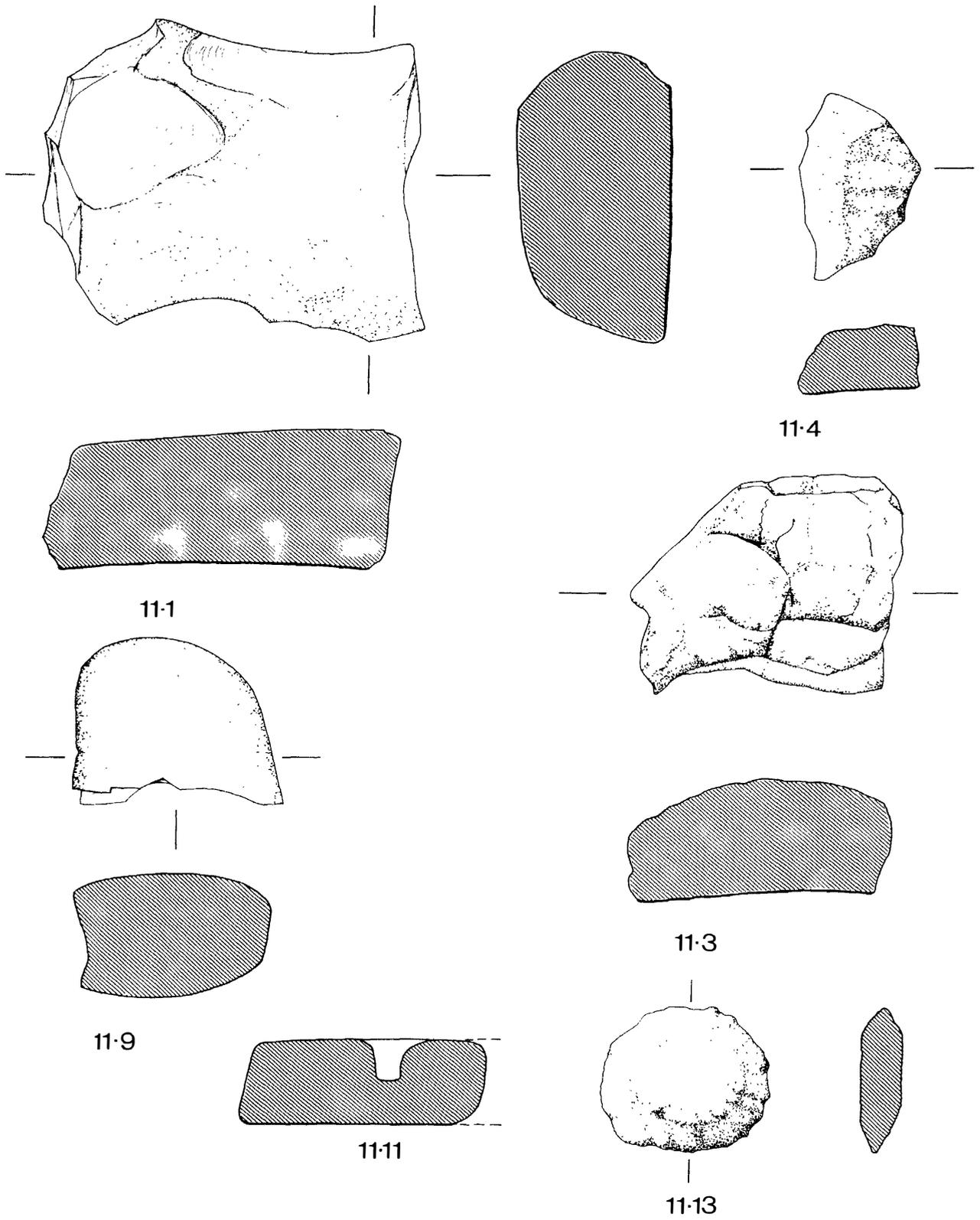


Fig 65 Little Waltham: objects of stone, 11.1, 11.3, 11.4, 11.9, 11.11, and 11.13, scale 1:3

wide faces to a greater extent than is usual with such pebbles, and its association with the quern no 3 tends to support the identification.

- 11.10 (unfigured) Quern fragment of Hertfordshire puddingstone, the pebbles mostly dark grey and the matrix cream. One face, c 9 cm × 11 cm, has been rubbed flat in use; the fragment is a maximum of 5 cm thick. From the south butt end of the wall trench, hut C8A. Not an erratic; presumably imported to the site.

B Rotary querns—Period V

- 11.11 Fragment of the upper stone of a rotary quern, probably of Millstone Grit (Carboniferous). The upper and lower faces retain slight vestiges of tooling; the edge is smooth. There is a hole (half survives) in the upper face, to take a handle. From ditch 353. Fragments of the same, or a very similar, quern came from features 350 and 361, the traces of tooling on one face of the latter being clearly concentric.
- 11.12 (unfigured) Several fragments of a Niedermendig/Mayen basalt quern were found, residual in features 307 and 337 (Period VI). The upper and lower faces and edge of one fragment retained traces of tooling.

C Other material

- 11.13 Fragment of basalt as no 12, cut to an approximately circular shape with splayed edges. It seems to be a weight, perhaps cut from a fragment of a quern. At 225 g it approximates closely to 8 *unciae*, or 2/3 of a Roman *libra*.⁴³ From the well, F339, sludge filling, Period V.

Fragments of ferruginous sandstone, haematitic, possibly smeltable, and a fragment of coarse grit containing an ironstone layer, probably limonite, probably smeltable, were also found,⁴⁴ in the gully of hut C2 and the wall trench of hut C17B respectively.

12 Brick and tile

Period V

A thin scatter of fragmentary Romano-British bonding tiles, *tegulae*, and *imbrices* was present generally in Period V and later features. All were in a more or less sandy fabric; bonding tiles ranged from 30 mm to 40 mm in thickness, and *imbrices* from 11 to 18 mm. *Tegulae* were normally between 15 mm and 25 mm thick, with flanges 18–20 mm wide and 20–27 mm high. Two examples, one from ditch 314, the other unstratified, had flanges 27–30 mm wide, tending in Essex to imply a relatively early date. *Tegulae* with very narrow flanges, typical of the 4th century in Essex, were conspicuously absent. Two fragments of box flue tile were found; one from F350, and the other, with a hole 40 mm in diameter, from F363.

The material is entirely consistent with that usually encountered on a rural site in this area; it seems that no useful inference can be drawn from the presence of bonding tiles or box flue tiles, especially since none bore traces of mortar.

Period VI

The only tile present in Period VI features was residual material of Romano-British date.

Period VII

In area A, pegtile fragments 12 mm thick occurred in features 310 and 355, the latter including a fragment with lime mortar adhering. In area B, ditch 261 produced fragments of pegtiles 13 mm thick, tile 18 mm thick, (? earlier nibbed tiles) and soft brick 45 mm thick. The water-course 262 produced fragments of pegtile and coarse soft brick, 14 mm and 55 mm thick respectively.

13 The fired clay

A Objects (Fig 66)

Weights

- 13.1 Triangular weight, the lower part broken away, in a poorly worked, slightly sandy fabric containing substantial flint pebbles. A complete tapered hole survives, together with traces of two others. The shape approximates to an equilateral triangle. From hut C8B wall trench, L3, Period II.
- 13.2 Part of a triangular weight, rather more elongated in shape than 13.1; a single hole survives. The fabric is predominantly reddish-orange, poorly worked with many small voids, and contains small pebbles. From Hut C8A wall trench, Period II. Fragments of similar triangular weights were found in the wall trenches of huts C11, C13, and C17C (Period II), the wall trench of hut C1 (Period II) and F255 (Period III).
- 13.3 Weight of trapezoidal cross-section, with a notch 6 mm deep to facilitate suspension; part of the back and base is broken away. The fabric is similar to that of 13.1, and rather underfired, with a black core. From F255, Period III.

Other objects

- 13.4 Object in a lightly fired, crumbling, almost sandless fabric, with black interior and red surfaces. It was shaped in the fingers, and still retains fingerprints. The object seems to be a support, but for what is unknown. Similar objects are known from salt-working sites on the east coast, and indeed on the Dutch coast, but they are usually larger (eg those from the Spanjaardsberg, twice the diameter of this example—Modderman, 1961, Afb 35). In any case it would be odd for equipment associated with brine evaporation, other than the pans in which salt was crystallized and probably sold, to be found so far inland. Even at Gun Hill, only some 3 km from the shore of the Thames Estuary, the only items of 'briquetage' found were the salt pans themselves (Drury & Rodwell 1973, 74). These latter were in an Iron Age context, but the same appears to be true of early Roman contexts in Chelmsford, as (unpublished) excavations by the author have shown. Similar objects, but again much larger, have been found associated with pre-Flavian surface-built pottery kilns in Northamptonshire (Woods 1974, 276, and fig 5, C–E). From the pit 162A, Period II.

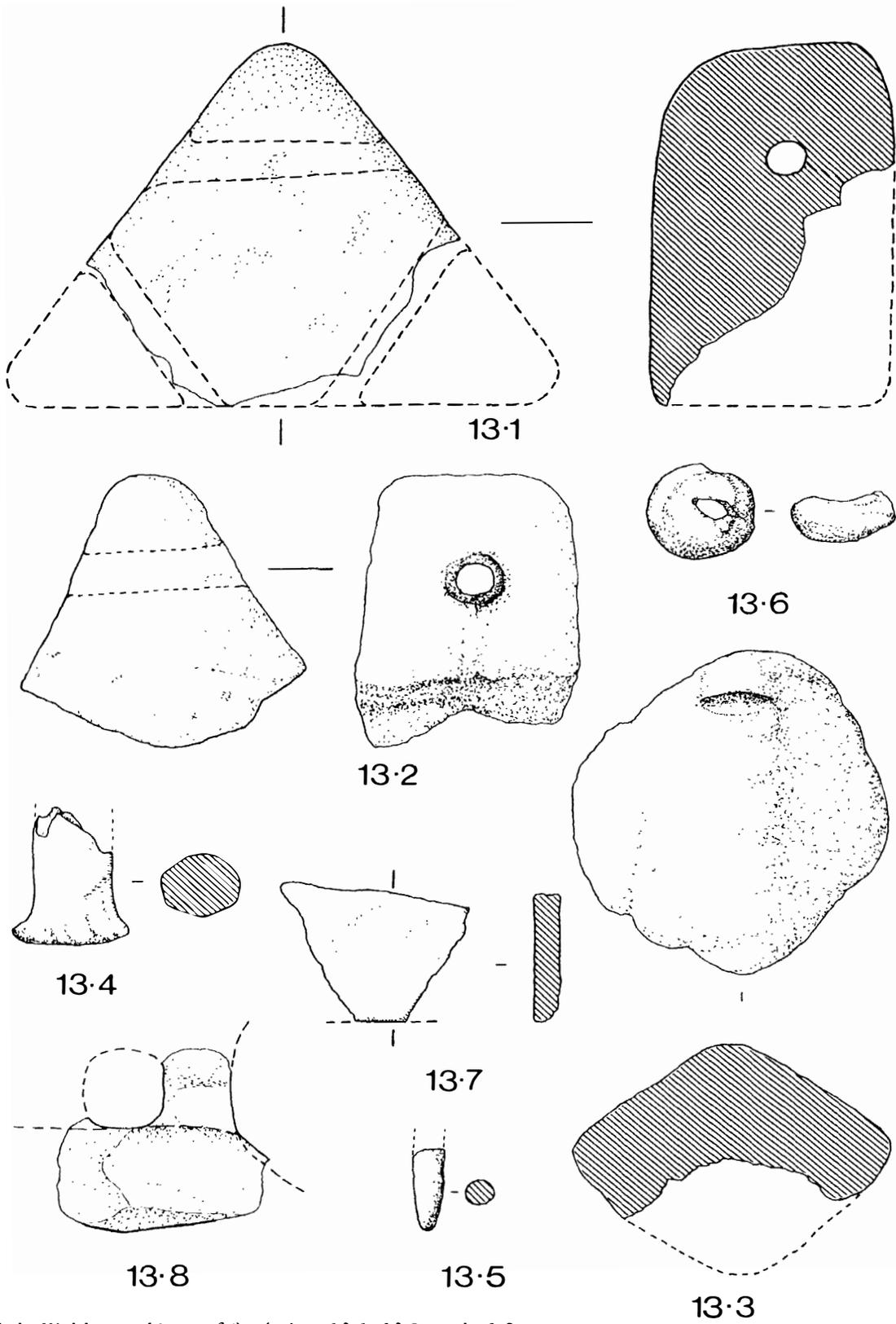


Fig 66 Little Waltham: objects of fired clay, 13.1–13.8, scale 1:2

- 13.5 Cylindrical object terminating in a blunt point, in a sandy light brown fabric, the exterior tinged with grey. Use unknown; from the wall trench of hut C6, Period II.
- 13.6 Irregular object in a soft, crumbling, brown fabric, almost sand-free. The underside is partly broken away, hence it is possible, though unlikely, that it was the head of a generally thinner object. The irregular hole appears to be original. Its use is unknown: what remains of the underside is rougher than the top, but the object seems to be carelessly made and may even have been fired accidentally. It certainly seems too irregular to have been a spindle whorl; perhaps it was a small weight. From pit 173, Period IV.
- 13.7 Fragment of a flat plate, in a hard, orange-brown fabric containing much coarse sand. The upper surface is relatively smooth and retains signs of being formed with the fingers; the underside is irregular, retaining some vegetable impressions. There seems little doubt that it was formed by spreading a lump of clay on a surface covered with vegetable matter, to prevent adhesion. Plates of this type are conventionally associated with ovens. This fragment, the only one found (or at least identified) came from a Romano-British (Period V) context, F345.

B Structural clay accidentally burnt

Burnt clay, generally in the form of flecks or lumps a few millimetres in diameter, occurred in almost every feature in area A. This material was presumably derived from two main sources: the use of hearths, ovens, etc, and the destruction by fire of buildings with wattle and daub infill. Unfortunately, nothing which could definitely be ascribed to ovens or similar structures was found; the identifiable material is all apparently burnt daub, principally derived from the destruction of huts C11 and C6 in Period II.

The material indicates that wattles between 20mm and 40mm (average 25mm) in diameter formed the uprights, the intervals between the wattles approximately corresponding to the width of the wattles. Much of the timber was circular in section, probably saplings and young branches, but some squarish timber was probably riven. Sections such as that illustrated (13.8, Fig 66) indicate that the verticals were reinforced with horizontals of similar dimensions at intervals. The uprights were covered with about 40mm of clay on the side to which the horizontals were fixed, and some 25–30mm of clay on the opposite side. Although no complete sections of wall have survived, the total thickness was probably in the region of 100mm (4in). The section 13.8 further suggests that the principal uprights were left exposed, the daub forming true panels between them, apparently always finished smooth. The horizontal members were probably wedged in place—on 13.8 there is some evidence for the horizontal member having engaged in a recess in the upright—and the uprights set into the ground. The members may have been tied at the intersections with withies, though no evidence for this has survived; the size of the horizontals seems to preclude the panels being woven, in the manner of a hurdle.

The technique as described corresponds closely with medieval practice in the area, but is markedly different from that used in Roman Verulamium during the 2nd century AD (Frere 1972, 8). Particularly in the case of hut C11, the fire was intense enough to cause vitrification, the debris being grey in colour and of low density, containing much trapped gas.

C Note on the scientific examination

by Leo Biek

Fifty-six groups of burnt clay, including both objects and other fragments (as described in A and B above), were closely examined visually and under low-power microscopy, together with X-radiographs of a selection of them produced by John Price at the Ancient Monuments Laboratory. It was clear that four main types of material were present, irrespective of function:

- a Creamy grey, highly vesicular, low density, 'slag'-like irregular lumps of highly vitrified clay.
- b Mostly reddish, sometimes black-surfaced, 'cindery', more compact and vaguely 'shaped' fragments.
- c Buff to red sandy 'fabrics'.
- d Multicoloured, but mostly reddish-pink with light-brown and grey-to-black irregularly patchy, pieces of lightly or hardly burnt plastic clay with occasional large grits.

An attempt was made to relate particularly types *c* and *d*, in general, to the different subsoils present by plotting their distribution on the overall plan. Arising from this, the connexion between different groups of huts, and periods, was investigated in these terms. Further, the various material textures were related to pottery radio-fabrics as far as possible (see p 59 and Pls XIII–XXIX). Finally, types *a* and *b* could clearly be associated with burnt-down structures and a few specific correlations seemed valid.

It was found that type *d* was in fact present, with one exception, only in the form of (fragments of) objects, mostly loomweights, for which the rather dense ('heavy') material was of course best suited. However, about half of all the burnt clay examined was of type *c* and this also included (fragments of) objects—nearly twice as many as there were bits of daub. All these finds came from every area and (Iron Age) period so that no general correlations can be suggested within the limitations of the evidence. Nevertheless it is clear that type *d* originated broadly speaking from material of the type of the 'London Clay', and type *c* from 'Brickearth' (see p 4). Transitional areas on fragments of types *b* and *a* clearly show them to be (progressively) 'hotter' forms of type *c*.

One needs to remember in this context that several classes of finds with histories of varying complexity are covered by the general term 'burnt clay'—ranging from (1) hardly or roughly shaped lumps, air-dried or lightly baked at the fire, to (2) carefully worked (and tempered?) forms deliberately fired to higher temperatures; or (3) material from hearths or walls that came to be fired, incidentally or accidentally, together with other (unknown) substances under differing conditions of atmosphere and heat—and possibly including various re-firings.

It would seem in our case that class (1) objects were exclusively of type *d* material, while class (2) objects were in type *c*. Class (3) material will obviously be found quite near to where it was burnt and seems more significant for locating its source. At first sight this is flatly contradicted by the evidence. One needs to accept that small artefacts are mobile and it is not surprising that as many 'objects' of type *d* as of type *c* are present in huts C1 and C2 of Period IV in the northern part of the Brickearth area. But the only fragment of daub from the 'London Clay area' with wattle imprints is of type *c*, and the only comparable fragment of type *d* comes from the 'Brickearth area'. Type *d* is not likely to have fired well and would not be expected to survive or be detectable as well as type *c*, so that it may be under-represented for that reason.

Whatever the quantitative aspect, one clearly needs to consider the possibility of common sources, for both loom-

weights and daub, away from the immediate find-spots. At Winklebury (Williams 1977) it could be shown that certain 'puddling pits' found containing clay had been used to prepare the clay for weights and whorls, whose fabric bore little relation to the pottery on the site. Here at Waltham, two possibly similar 'clay-lined' pits were noted, and the origin of one pit complex partly bottoming in isolated patches of sand was suggested (independently) as being 'for daub' (p 125). This pit complex (F162) lies in the Brick-earth area some 20 m north of its (stated) boundary with the London Clay, and immediately south of hut C3. One of the two clay-lined pits (F162A) lies actually within this complex. The other similar features (F127, 129, and 131) in a sense continue the line of the complex and link huts C3 and C4—and the second clay-lined pit (F175) lies actually within this second hut.

If one suggests this small area of barely 5 m radius as a possible source of daub for the immediate surroundings, say huts 3 and 4, one is hampered by lack of evidence: nothing from C4—one fragment each from C3 (*the* single type *d*) and F162 (type *c*). The suggestion becomes more plausible if the radius of supply is slightly extended to include two or more adjacent huts as well. In view of the variability of the subsoil, especially in that area (see p 6), and the occurrence there, in (clearly residual) type *a* material, of lumps of highly iron- (?with manganese-) stained and cemented gravel conglomerates, it is very likely that the Brickearth capping at this spot was thin enough for quarrying to bring up underlying London Clay as well. In that case any spatial—and possibly also the functional—dividing line between type *c* and type *d* sources becomes blurred.

Both type *b* and (particularly) type *a* material are associated with high temperatures of formation. Type *b* is analogous to (overfired, part-vitrified) pottery wasters. Type *a* is comparable to the residues found on sites of (modern) haystack fires, and formed at hot spots where the vegetable ash fluxes the underlying soil into vitreous sponges (Nickolls, 1977). Its occasional presence in association with huts C3, C4 and, indeed, most others of Period II is noteworthy but perhaps not significant; yet it does, particularly in C6, C11, and C18, where it occurs in quantity, underline the fierceness of the fire which destroyed some or all of them and is the only, if indirect, evidence for thatch.

14 The metalworking residues

Period III—Iron Age, 2nd to 1st centuries BC

The debris dumped into the silt (L3) of the gully surrounding hut C2 (p 32 above) included charcoal (p 116 below), formless fragments of burnt clay and, in the south-western sector, two fragments of bloomery iron—the only two fragments of iron of this date and stage in production that have so far been analysed (for a report of similar material, and part of a tuyere, see Cra'ster 1961, 33).

Bloomery iron

R F Tylecote

Two irregular lumps of iron (AM729545), heavily rusted, were received for examination. Both the rust and the iron were strongly magnetic. On hammering, the rust fell away revealing good, dense metal, which was difficult to cut.

Pieces were cut from each of the lumps and mounted in the usual way. The structures (Pl XI) were similar, consisting of large equiaxed ferrite grains which were very difficult to etch in nital. It was clear that the metal had a high phosphorus content. Slag was relatively infrequent. It was present mainly in large masses, and it was clear from its

distribution that the metal had had little forging since it left the bloomery hearth. High-power examination showed no carbon and therefore we can say that this is less than 0.02%, if present. Hardness tests showed that one piece had a hardness of 197, and the other of 188 HV5. In the absence of carbon this suggests a phosphorus content in the range of 0.9–1.1%

CONCLUSIONS

Both pieces consist of high-phosphorus bloomery iron. They could have come from the same smelt or bloom. High-phosphorus ores are common in England. Stamford (Tylecote 1968) has yielded such ores, West Runton (Norfolk) both ores and metal (Tylecote 1970). Nearer at hand we have the two pieces from a Roman site at Braintree (Tylecote 1976). One of these was very low in phosphorus, while the other had some phosphorus though not nearly as much as in the present samples. But then the ores available in Britain vary in phosphorus content from nearly zero in the case of the Forest of Dean, South Wales, and Cumbria, to those in most areas that are capable of giving phosphorus contents of up to 1% or so. The latter are very much in the majority.

Other residues

Leo Biek and Justine Bayley

PERIOD V—ROMANO-BRITISH, LATE 3RD CENTURY AD

Smithing slag was recovered from three contexts in area B; all was probably deposited during the late 3rd century AD. In addition, a few fragments were residual in Period VI features 330 and 336.

(a) Material from field ditches 314 and 353 (AM 729546–7).

A small amount (525 g) of mostly high-density smithing slag with much 'iron', one piece possibly a fragment of characteristic 'bun shape' from hearth bottom, originally *c* 120 mm in diameter and of 30 mm central maximum depth; a few small fragments of fuel ash slag rich in 'iron'. Associated with this, some charcoal (AM 729567) containing *Populus* sp., often encountered in ironworking contexts (Biek 1977(b))—reputedly for producing a 'fierce blaze'—together with Oak for a 'steady heat', also present here.

(b) Material distributed through the filling of the well, F339, which went out of use *c* AD 300 (AM 729548).

(i) A similar amount (650 g) of material similar to (a) above, including a smaller but complete bun shape (*c* 90 mm × 80 mm, 30 mm deep) with a separate, loosely adherent, thin light-coloured ferruginous skin—presumably due to contact with sandy 'subsoil' while hot—over much of the convex (bottom) surface.

(ii) A somewhat smaller volume (225 g) of slag similar in texture but grey in colour and of lesser density, evidently of lower Fe/Si ratio, also including a 'bun shape' *c* 70 mm × 60 mm, 25 mm deep; probably derived from activity in boulder clay subsoil.

(iii) a few fragments of conglomerate, with bits of waste iron cemented into surrounding subsoil by corrosion, iron-pan wise.

Specks of green copper corrosion products were found on slag fragments from both (a) and (b), indicating mixed smithing in both contexts. The patches of undisturbed clay fired *in situ* (354, 359), and associated with postholes (p 43 above), lie fairly close to ditch 353 and may be connected with this activity.

UNSTRATIFIED

Corroded bronze fragment in shape of small 'bloated' coin, almost totally mineralized (AM 729549); matrix of mostly

crystalline cuprous oxide (purple) containing very largely discrete, small metallic grains; some amorphous white areas/layers. Full of blowholes, some very large—spilt molten bronze from casting? Found at base of ancient ploughsoils south of hut C14, area A, after machine clearance; probably derived initially from a Period II or Period III context.

15 Charcoal

Charcoal flecks were ubiquitous in features in area A, and to a lesser extent in area B. Material from 36 Iron Age contexts and 2 Romano-British ones was identified at the Ancient Monuments Laboratory. In general, sample size was dictated by the variable extent of coherence and from the Iron Age features only fragments of reasonable size were submitted. In the two Romano-British features the material had significant associations. Nevertheless, in most cases it was not possible to indicate timber size, nor was it practical to attempt identification of more than half of the sample, and sometimes even less. The following summary should be seen within these limitations.

Quercus sp. (Oak), as a twig or larger timber, was present in every sample except two, usually alone; including Iron Age postholes 6, 13, 46, 67, 91, 92, 96, 97, 99, 100, 116, 118, 122, 123, 154, 183, 190, 191, 226, 227, 228, and 239. Of the remaining samples from postholes, that from F2 additionally contained some *Pyrus* type which could also include *Crataegus* (Hawthorn), *Malus* (Apple) and *Sorbus* spp., and that from F 193 some *Salix* (Willow) and *Hedera* (Ivy) spp. as well as *Pyrus* type.

Oak alone was found in the wall trenches of all the Period II huts sampled— C4, C6, C11 (substantial fragments), C16, C17A and C17B—except C9 which held only other species: *Acer* (Maple) and *Pyrus* type. These samples were examined more thoroughly than most others. The predominance of Oak in these contexts, both from substantial timber and twiggy material, seems to indicate that it was used almost to exclusion for structural purposes, certainly for the main timbers, but also, in the case of the twiggy material, for wattles. The gullies around the Period III huts produced a different range of accessory woods. From C1 came *Fraxinus* (Ash), *Carpinus* (Hornbeam) and *Ulmus* (Elm) spp., and from C2, *Corylus* sp. (Hazel), with Ash and Maple. The enclosure trench of the same period, F255, produced the only other Oak-less sample, containing Maple, Hornbeam, and *Pyrus* type. All this material probably represents domestic fuel gathered from the surrounding area, though it could be derived from wattles. Two of three samples from pits contained Ash (165, Period IV) and *Pyrus* type (82, Period II) in addition to Oak, which alone was present in the third sample (1973, Period IV).

The charred planking associated with the Period V cremation burial, F360, was of Oak. A sample from the ditch, 353, associated with smelting slag, additionally contained some *Populus* sp. (Poplar) and Hornbeam; it probably represents the fuel used in the process (see p 115). Poplar did not occur in Iron Age contexts.

16 Animal bone

Alison Gebbels

Periods II, III, and IV: Iron Age

The bones from the Iron Age features were generally in very poor condition, survival being largely limited to teeth

except for the sample from hut C15, which was relatively well preserved. Calculations of minimum numbers and measurements were therefore impossible, and the bones are dealt with as one group. Excluding the material from C15, species represented are cattle, horse, pig, and sheep:

Cattle: one individual is young, under two years old, not having attained its full permanent dentition. The other teeth indicate adult animals, but there is little sign of wear and the animals were probably between three and five years old at death.

Horse: This was represented by three teeth from a small young adult, from F263.

Pig: represented by a single unerupted canine of a female, from a very young individual under one year old, from hut C17.

Sheep: long bone fragments, of sheep size, were found in F193.

The group from hut C15 contained both long bones and teeth of cattle and sheep, which may represent a minimum number of one sheep and one ox. The ox appears to be a small but adult individual (based on tibia and scapula fragments, and part of a horn core). No measurements were possible. Sheep were represented by a few permanent teeth and some broken long bone fragments (possibly connected with marrow extraction).

The limitations of the group are such that the absence of a species from features of a particular period need not imply its original absence from the site. Nonetheless, it seems worth while to list the species present in each period, as follows:

Period II: cattle, horse (huts C8, C11), pig (hut C17), sheep hut C15.? F 193).

Period III: cattle, horse (F256, F263).

Period IV: cattle.

Period V: Romano-British

F360: The cremation burial

This contained:

(i) in the upper pit filling, part of the skull of a young male pig, under two years old.

(ii) in the pit filling, some rib fragments of a sheep, and near-complete skeletons of a domestic fowl and a piglet which was foetal or newborn.

(iii) in vessel E, fragments of an ox skull.

Ditches 309, 314, and 365

The samples from these features were dealt with together. Minimum numbers were:

<i>Horse</i>	<i>Ox</i>	<i>Dog</i>	<i>Sheep</i>
1	1	1	1

Cattle

The individual represented is a young animal, approximately 2 years old, still retaining some deciduous dentition. Also present are some rib fragments, first and second phalanges, which are probably from different limbs of the same individual; parts of the horn core; a metatarsal; and a tibia. Some of the vertebrae show signs of butchery.

Measurements (mm)

	tl	pw	msd	dw
Metatarsal	211	45	25	49
Tibia				65.5

tl = total length (max)

pw = max proximal width

msd = max mid-shaft diameter

dw = max distal width

Horse

The individual is possibly male (a canine is present), and therefore at least four years old. Since the other teeth do not show much sign of wear it was probably between four and five years old.

Four vertebrae (including an atlas) and a metapodial, are also present.

Measurements (mm)

	tl	pw	msd	dw
Metapodial	242	45	27.5	41.5

Sheep

One adult is represented by four teeth.

F339: The well

THE UPPER FILLING

This contained horse, cattle, sheep, fox, and deer. The minimum numbers are:

Horse	Cattle	Fox	Deer
2	4	1	1

Horse

One individual was young, still retaining some deciduous dentition, and was judged to be between three and four years old.

The other individual had its full permanent dentition showing signs of wear and was probably over six years old. The proximal end of a femur was also present.

Measurements (mm)

	tl	pw	msd	dw
Metatarsals	241	43.5	24.5	41
	241	42.5	25	38
Humerus	—	—	—	81
Tibia	316	—	35	65.5
1st phalanx	72	53.5	32.5	42.5

Cattle

The minimum number was based on the numbers of teeth and mandibles. One individual is represented by a pair of mandibles, still retaining some deciduous dentition, and was aged between two and three years.

The second individual is represented by tooth germs only and was probably under two years old.

The third individual is adult, with full permanent dentition, showing little wear; therefore it was probably aged between three and four years.

The fourth individual is solely represented by two worn incisors and was judged to be well over four years old.

All long bones were very fragmentary, thus measurements were impossible. The distal end of a radius with its unfused epiphysis confirms that one individual of under four years old is present.

Sheep

One adult individual is represented by a single little-worn tooth. A metapodial shaft and a tibia shaft are also present.

Fox

This is an almost complete skeleton of an adult, with full dentition. It has a healed fracture of a humerus.

Deer

Represented by three quite worn permanent teeth of red deer. There were also a few unidentifiable fragments of poorly calcined bone.

THE LOWER FILLING

This contained cattle, pig, bird, dog, sheep, and horse. The

minimum numbers are:

Cattle	Pig	Bird	Dog	Sheep	Horse
4	1	1	2	2	1

Cattle

Teeth and mandibles indicated that one individual of about two and a half years was present as well as a young adult.

The third mandible shows a hole in the side, probably made by a sharp instrument.

The mandible of the fourth individual displays recession of the alveolar bone.

Measurements (mm)

	tl	pw	msd	dw
Metatarsal	225	45.5	27	54.5
1st phalanx	60	27	93.5	25
2nd phalanx	40	28	22	24

Pig

This is represented by the skeleton of a piglet of 'newborn' size.

Bird

The skeleton of a male domestic fowl is present.

Dog

Two individuals were identified. One is fairly complete: a mature adult showing slight signs of deformation of the long bones (similar to rickets which is caused by a calcium deficiency). One vertebral spine had been broken and then healed during life.

The other individual is small, and poorly represented.

Measurements (mm)

	tl	pw	msd	dw
Femur	120	29	11	25
	121	30	11	25
Tibia	112	27	11	18
	112	27	11	17.5
Humerus	110	30	11	25
	109	—	11	24.5
Radius	—	18	—	—
Tibia	—	—	—	14
	—	—	—	14

Sheep

The sheep were represented by two mandibles. Neither had achieved full permanent dentition; one is between one and two years old, the other is about two years old.

Horse

This is represented by a scapula and a vertebral spine.

The ages of animals given above are based on the ageing of modern specimens and only intended as a guide. A few fragments from Period VI features, probably residual from Period V, were not submitted for specialist examination.

17 Cremated bone from the burial, F360

C A Keepax

A small amount (161g) of fairly well calcined, highly fragmentary bone was recovered from the cremation burial, F360. The largest fragments are 3 cm long. The sample consists mainly of long bone shaft fragments (with only slight fissuring and twisting) and some fairly thin skull vault fragments with open sutures.

No estimation of age or sex could be made, owing to the small size and indeterminate nature of the fragments. They do not display any characteristics which definitely establish them as human, but the general appearance is consistent with that of human bone.

18 The edible molluscs

J G Evans

The following species were identified from the lower fill of the Romano-British well, F339:

Mytilus edulis L, edible mussel. Fragments.

Ostrea edulis L, oyster. Lower valve 1, upper valve 1.

Buccinum undatum L, whelk or buckie; 1 broken apex. Crab or lobster fragments.

There was also an example of *Gryphaea* sp., a fossil oyster probably of Jurassic age.

The three molluscan species are marine, and commonly occur as food animals on Roman sites in Britain. The crab (or possibly lobster) fragments are more unusual and have not often been recorded. This, however, may be because they are more easily destroyed than mollusc shells.

[Oyster shells were also found sporadically in other Period V features-PJD-]

19 Examination of charred 'food', residue on a potsherd

John Evans

An irregular vesicular black layer 1-2 mm thick was found, loosely adherent in patches to the (inside) surface of vessel 315 (Period IV; p 82 above). Its infrared spectrum suggested the presence of starch. A quantitative estimation of the suspected starch was carried out using the procedure put forward by Clegg (1956, 40). This method involves the conversion of starch to glucose with perchloric acid, followed by analysis of the glucose by spectrophotometry. By comparison with a standard curve the starch content of the residue was found to be about 6%. Thin-layer chromatographic analysis for fats, etc produced no positive results. The most likely origin of the char, taking into account also the type of vessel and absence of recognizable structure, is a vegetable gruel. The nature and formation of such chars, and the persistence of organic matter in them, has been discussed recently (Evans & Biek forthcoming); they are far more frequent and informative than had been thought, and thus merit greater attention.

VI Discussion

Early occupation

Mesolithic activity is clearly attested, mostly in area A, nearest to the river. Recent work in Essex suggests that 'brickearth' sites adjacent to rivers were favoured in this period; at Chelmsford, further downstream, and at Kelvedon on the Blackwater, much lithic material has been found, some in apparently contemporary features.⁴⁵

If we accept the evidence of a single radiocarbon date, derived from a relatively small sample, the Neolithic occupation attested by features 250 and 251 is to be placed in the fourth millennium BC. However, there is no inherent reason why a date of 3170 ± 130 bc⁴⁶ should not be accepted. In 1974, Smith (fig 12, p 102), could point to two other sites in eastern England, between groups in Sussex and east Yorkshire, which had yielded comparably early dates-Broome Heath, Ditchingham, Norfolk (BM-679: 3474 ± 117 bc) and Shippea Hill, Cambridgeshire (Q-527/8: 3000 ± 120 bc), to which may be added Eaton Heath, Norwich, Norfolk (Wainwright 1973, 9; BM-770: 3145 ± 49 bc).

The three recognizable pottery vessels from Waltham are plain slack-S-profiled bowls which would not be out of place in an early Neolithic context, and which have been compared (p 51 above) with the material from Broome Heath (Wainwright 1972) and Clacton (Warren *et al* 1936; Warren & Smith 1954). In the absence of a more representative collection, it is impossible to assign the vessels to a specific ceramic tradition, but they would not be out of place in the Grimston/Lyles Hill series (as defined by Smith 1974, n 24). Their closest affinities are, not surprisingly, with the material from Clacton, unfortunately undated, save for the fact that it is stratigraphically earlier than an elaborate decorated bowl.⁴⁷

Leaf-shaped arrowheads of the form represented by our Fig 64.64 are commonly associated with Neolithic plain bowl styles (p 110 above); the possible laurel-leaf (Fig 64.58), and the bifacially worked point (Fig 64.66), could also be contemporary with the pottery. However, the absence of any appreciable amount of lithic debris which can be assigned to the Neolithic occupation is surprising. Work on flints from other recently excavated sites in Essex, currently being undertaken by Mrs Healey, may suggest reasons for this.

The relatively small number of Neolithic sites recorded from Essex has recently been augmented by aerial reconnaissance, resulting in the discovery of the henge at Lawford in the Stour Valley, and the causewayed enclosure at Orsett on the Thames terrace.⁴⁸ However, Waltham remains one of the few sites where Neolithic occupation is attested on the heavier clay land that makes up much of the area. The extent to which such land, rather than the gravel terraces, was settled in the Neolithic is important for future consideration. The presence of a causewayed enclosure at Sawbridgeworth, on a narrow band of river gravel adjacent to the Stort but within an area where boulder clay predominates, may be relevant to any such consideration (Palmer 1976, 162, 184). Since the detection of Neolithic sites from the air is virtually impossible on clay, discoveries in clay areas must almost inevitably stem from chance finds or earlier features encountered in the excavation of later sites, as at Waltham or Saffron Walden.⁴⁹ Whilst a preference for the lighter soils which develop on sand or chalk is inherently likely, the apparent paucity of settlement in other areas cannot be used as negative evidence, especially in view of a recent consideration of settlement economy (Smith 1974, 123-4, and refs cited).

The site was clearly unoccupied between the early Neolithic period and the inception of the Iron Age settlement in the 3rd century BC. The only artefacts which can be assigned to the intervening period are the barbed and tanged arrowhead (Fig 64.65), and the Bronze Age sherd (Fig 46.128). These may be derived from the use of the site for agricultural purposes, whether continuously or not; environmental evidence from the old river channel suggests a pastoral landscape during at least part of the Bronze Age (p 146 below). Hence occupation in the general vicinity, though as yet unproven, seems inherently likely. There is a reference to a possibly significant early find: Mr T C Neale of Springfield exhibited an 'ancient brass spear' found at Little Waltham to the Chelmsford Philosophical Society on 8 August 1843.⁵⁰

The Iron Age settlements: Periods II-IV

Structures

The circular huts

There is general agreement concerning the basic form of these buildings in lowland Britain; a conical thatched roof,

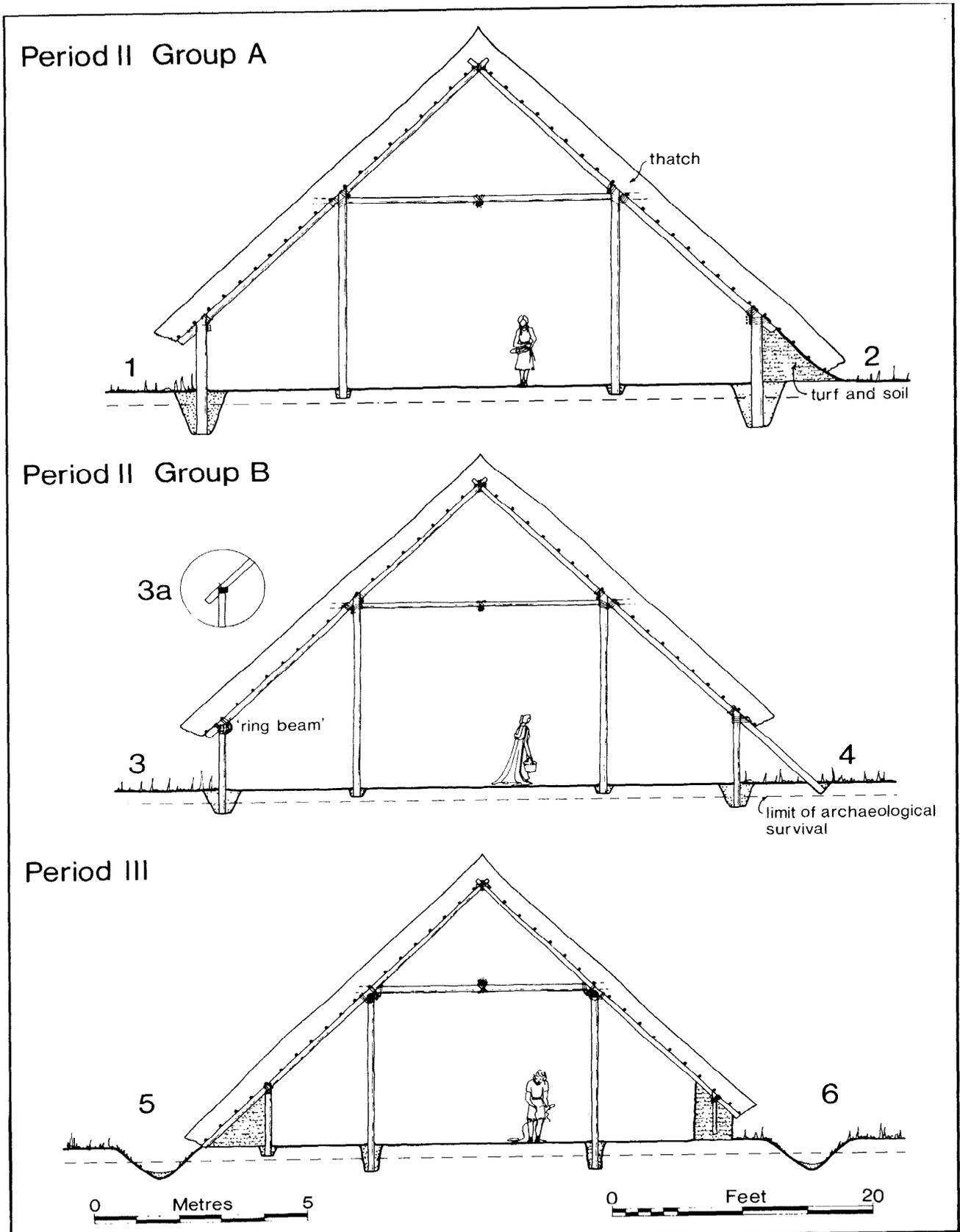


Fig 67 Little Waltham: hypothetical sections of huts of Period II (groups A and B) and Period III

whose rafters were supported on a relatively low external wall, and usually also by an inner ring of posts, probably linked by a ring-purlin. The hypothetical sections of the Waltham huts (Fig 67) are based on two general assumptions—a minimum height between rafters and floor of c 1.5-1.7m (5ft-5ft 6in), and a roof pitch of 45°. Wall height is less important than roof pitch in determining the cross-sectional areas of the buildings, as the drawings illustrate. A round hut recorded in 1964 in the Roman Campagna, used seasonally by shepherds, had a roof pitch of about 55° (Close-Brooks & Gibson 1966, fig 1), and earlier records suggest that this pitch was also used on larger buildings in the same area (*ibid*, 349, n 6). Recent practice suggests that thatch is not satisfactory if used at a pitch less than 45°- 50°. A minimum pitch of 45° therefore seems to be a reasonable assumption. However, in combination with the modest wall height proposed, the result in the case of an average Group A hut of Period II (13.1m diameter, measured to centre line of wall), is a structure some 9m (30ft) high at the apex. The assumption of a wall height of 2m and a pitch of 55° produces an apex height of some 12m (40ft); this seems excessive.

No attempt will be made to reconstruct the appearance and structure of the buildings in detail; there is little evidence from the site that would aid such reconstruction, and a detailed consideration of the evidence from elsewhere would be out of place in this report. However, a number of general points must be made, by way of explanation of the sections in Fig 67, and in order to facilitate discussion of those constructional features of which there is specific evidence. The predominant use of oak for structural purposes has been noted above (p 116). The drawings show principal rafters 10-11m long. Whilst this is not an impossible length for single timbers, especially if riven from larger baulks, the use of lap-jointed shorter lengths is possible, particularly where intermediate support is available. Whilst there is some circumstantial evidence for the spacing of the principal rafters (eg in hut C18), there is none for the form or spacing of intermediate roof timbers. Horizontal 'purlins' have been assumed, being the most economical method; in addition to carrying the thatch, they would also stiffen the roof structure considerably. This method was adopted in the Campanian hut (Close-Brooks & Gibson 1966, 350).

Practical experiment has suggested that rather than joining the rafters together at the apex, which then becomes choked with timber, the rafters can be held apart by being fixed to a 'ring beam' of withies set a little below the theoretical apex (Coles 1973, 59; Reynolds 1972). However, no such feature was found by Close-Brooks and Gibson (1966) in the Campanian hut. The provision of such a feature is clearly related to the idea of a central vent to allow smoke to escape from the hearth. However, the Campanian hut had no vent, the smoke escaping either through the door or the thatch—or not at all. Meirion-Jones (1976, 58) has noted primitive dwellings in Brittany, with central hearths but no chimney or vent, occupied within this century. The height of the Waltham huts in relation to that of their occupants, the form of the thatch, and the natural updraught may have made a central vent unnecessary, or even undesirable. Too great an updraught would almost negate the value of a fire, whilst if the latter were induced to blaze fiercely, sparks might be more likely to ignite the thatch. For the sake of simplicity no central opening is shown in the sections.

A feature of the Campanian hut likely to have been used in these larger buildings is the horizontal tie-beam at the mid-height of the roof. Two or more of these, connecting opposing principal rafters, would do much to contain the

outward thrust and, jointed where they crossed, would help to keep the shape of the roof. A secondary function as the basis of a storage or smoking floor cannot be ruled out, nor indeed can the use of horizontal ties at more than one level.

The use of relatively unsophisticated, though not necessarily weak, jointing techniques, utilizing notching and lashing with withies, etc, is implicit in Fig 67 and much of the discussion that follows, and indeed in most discussions of the form of these buildings (eg Musson 1970a, 274). How far this is justified is perhaps questionable. There are hints of more sophisticated structural carpentry in the Period II, group C huts, and in the four-post structure R1 (p 34). Iron was relatively precious and reusable, and thus only small items tend to survive from settlement sites. However, the presence of iron nails and dogs, the latter now used for fairly rough fixing of large baulks of timber, raises the question of the extent to which iron tools and fixings were available for use in building. The surviving dogs and nails are small, but larger ones could well have been in use, and have played a significant part in the construction of buildings.

In a circular building with a simple conical roof, the weight of the roof, acting through the rafters, exerts a considerable outward thrust on the top of the wall. With a timber external wall, unless the thrust is contained by the *effective* horizontal linkage of either the rafters or the tops of the wall timbers, it tends, assuming that the latter are inherently rigid, to force the wall outwards at the top and inwards at the bottom. This tendency can clearly be contained by setting the wall timbers sufficiently deep into the ground to counteract the outward thrust of the roof. This is Musson's 'mass wall' type of construction applied to a timber-framed structure (Musson 1970a, 274).

It is this latter solution which seems to prevail in the Period II, group A huts, which have deep wall trenches and, where the evidence survives, wall timbers of substantial size, eg C8, with timbers 0.20-0.35m in diameter. An addition of 0.35 m to the wall trench depths given in Table 1, to allow for topsoil and post-Iron Age plough erosion, gives a minimum original depth of 0.75m, rising to 1.15m in the case of C11. The timbers were surrounded in the trenches with the excavated material, and would depend for much of their stability on the compaction of the naturally cohesive brickearth and gravel (wall form 1, Fig 67). The massive wall trench, originally some 1.45m deep, which resulted from the reconstruction of hut C8 as C8B, may have been necessary to give a firm bedding for the new timbers, below the disturbance caused by their predecessors. Additional support could have been gained by revetting the walls with turf and topsoil, the roof being continued over this (wall form 2, Fig 67); this possibility will be considered below, in connexion with huts of Period II.

The presence of internal posts supporting the roof, though not demonstrated in this group, can yet be implied by the fact that the span of the rafters, at 6-7 m, seems too great without intermediate support. Posts providing intermediate support to the rafters would not, however, be subject to lateral thrust, the absence of which, coupled with the fact that the deeply set wall ensured sufficient anchorage of the structure as a whole, would mean that inner posts would only have to transmit part of the roof load directly downward to the ground. In these circumstances they would be as effective resting on the top of the subsoil, or even the ground surface, as in deep holes, since the hut roof would keep this surface dry and hard. The overall load-bearing capacity of a post or pile is increased only marginally by deep setting in homogeneous material; the slight gain is due to friction between the post and the soil. It need hardly be stated that shallowly bedded posts would leave no

trace on a site which has subsequently been intensively cultivated, a point demonstrated in Fig 67. Harding (1974, 40) has recently made a similar suggestion to explain the apparent absence of central supports from round houses in Wessex, with the notable exception of house 1 at Little Woodbury (Bersu 1940).

This form of construction has several obvious disadvantages. Whilst the provision of the massive wall timbers may have presented few problems in an expanding (and clearing?) community, their use in deep trenches must have necessitated considerable effort. Further, since the wall timbers would be perpetually in tension, even a limited amount of decay at ground level, a particularly vulnerable point, could cause structural failure of the building.

It would seem advantageous to contain the outward thrust at the eaves, so that the wall timbers are merely transmitting their share of the roof load downwards. In such circumstances, the wall timbers would only need to be buried to a sufficient extent to ensure the stability of the structure and its firm anchorage to the ground. The obvious method is to tie the tops of the wall timbers with withies, to form a sort of 'ring beam'. This, like the wall posts in the group A huts, would be in tension whilst the hut stood, but would be better able to resist rot than the feet of wall posts set into the ground. This form of construction seems to correspond with the group B huts, whose wall trenches were originally some 0.6-0.7m deep. There is a corresponding tendency for wall timbers to be lighter where evidence of size survives, as in the case of hut C7. This is wall form 3 in the hypothetical section of an average group B hut, 12.1m in diameter, in Fig 67. Perhaps the change implies no more than an increasing confidence in the construction of these buildings.

The possibility of another solution must, however, be considered, in view of the obvious problems of permanency which might be associated with lashed withies. If the principal rafters were extended to ground level, much of the weight of the roof could be directly transmitted to the ground, and the hut wall would then act only as an intermediate support to the rafters and, by virtue of its being set into the ground, as a means to anchor the structure as a whole. This solution seems unlikely, for no sign of post-holes for rafters was found beyond the walls; if they were so shallowly set as to leave no traces, they could be prone, being outside the eaves line, to rapid rot and the softening of their bearing in wet weather. However, the method was observed in 1964 in the shepherd's hut near Rome (Close-Brooks & Gibson 1966; Coles 1973, fig 8), and is shown on Fig 67 as wall form 4.

The general absence of internal posts from this group is explicable in the same terms as in the previous case. Where two or three posts occur on an arc concentric with the line of the external wall, in huts C6 and C9, this may be due to the replacement of shallowly-founded posts and the consequent need to obtain a fresh, firm bedding. Their spacing cannot be taken as a guide to the normal spacing of principal rafters in these huts. In the Campanian hut, four such posts supported bunk beds, and played no part in supporting the roof whatsoever; a similar explanation is possible here.

There is a marked tendency for substantial posts to occur Ranking the entrances of Period II huts, presumably to support a horizontal beam which carried the rafters over the gap. One can only speculate as to whether this portal rose above the eaves line, the walls being stepped down on either side, or the walls generally rose higher than has been assumed, to perhaps some 2m, to accommodate a reasonable entrance without difficulty. It seems probable that the considerable width of the entrance, of the order of 4m, was

necessary to admit light when weather conditions permitted. Their predominant alignment to the east, into the valley, was presumably to avoid the prevailing wind.

With the exception of evidence of large posts flanking the entrance, few huts provided further details of wall construction, owing to disturbance during demolition. Three distinct types can, however, be deduced as follows:

(i) Substantial timbers set close together, the width of the gaps approximately corresponding to that of the timbers. This was evidenced in the case of hut C8A. The gaps were presumably infilled with wattle and daub.

(ii) Solid timber, evidenced in the case of C7, using relatively light timbers; the cracks were presumably caulked with clay.

(iii) Post and panel construction, though not directly attested, appears to have been used. The quantity of burnt daub associated with hut C6 (above, p 18) was consistent in form with its having come from panels rather than the thin strips implied in (i), and particularly (ii), above. It is possible that the cluster of three stakes driven into the bottom of the wall trench (84, 85, and 86) represents *ad hoc* replacement of a collapsed or decayed panel *c* 0.70m wide, which seems a reasonable size. Evidence from hut C18 may suggest a panel and two posts a total of 1.10m wide.

If the earlier hypotheses are correct, method (i) may have been characteristic of group A huts, and methods (ii) and (iii) of group B huts. Of the latter two, solid timber might have given better thermal insulation; the choice could conceivably have depended on whether other operations, for example, the clearance of areas for agriculture, made quantities of suitable timber easily available.

Within Period II, the polygonal huts C15 and C18, forming group C, remain for discussion (Fig 68). If the interpretation of the group B huts in terms of the use of 'withies' to create an effective 'ring beam' is correct, a logical step might be to resolve the circle into a polygon, thus permitting the use of straight wall plates between principal rafters (Fig 67, 3a). Since much of the strength of the structure would then depend on the joints between the wall plate sections, relatively high standards of carpentry, and/or iron fixings (above p 120), would have been necessary. Whilst substantial posts are indicated, as usual, adjoining the entrances of C18, they are not present at the angles, from which one presumes the principal rafters rose. This should indicate that if a wall plate was used, it was able to spread the load evenly around the wall.

Huts C15 and C18, the former only partially excavated, provide the only real suggestion of the number and spacing of principal rafters used in these structures. The fourteen indicated for C18, allowing for central ones supported on the beams spanning the two principal entrances, compare favourably with the number indicated by an inner concentric ring of postholes on other sites, eg at Llandegai 2 (Musson 1970b). The absence of internal posts from these huts is explicable in the same terms as for groups A and B.

Hut C18 is notable for its three 'entrances' in the north, south, and east sides (Fig 68). These seem unnecessary purely to provide access for man or beast, and may therefore have been intended to provide a maximum amount of daylight and ventilation. The layout of the openings is reasonably regular. The conclusion tends towards a building constructed for a special use rather than domestic occupation, but beyond that the evidence will not stretch. Nothing was found associated with the building to suggest what that use might have been.

Subsequent to the original construction, it is likely that the eastern part of the southern opening was blocked, apparently by a substantial wall, and the central support

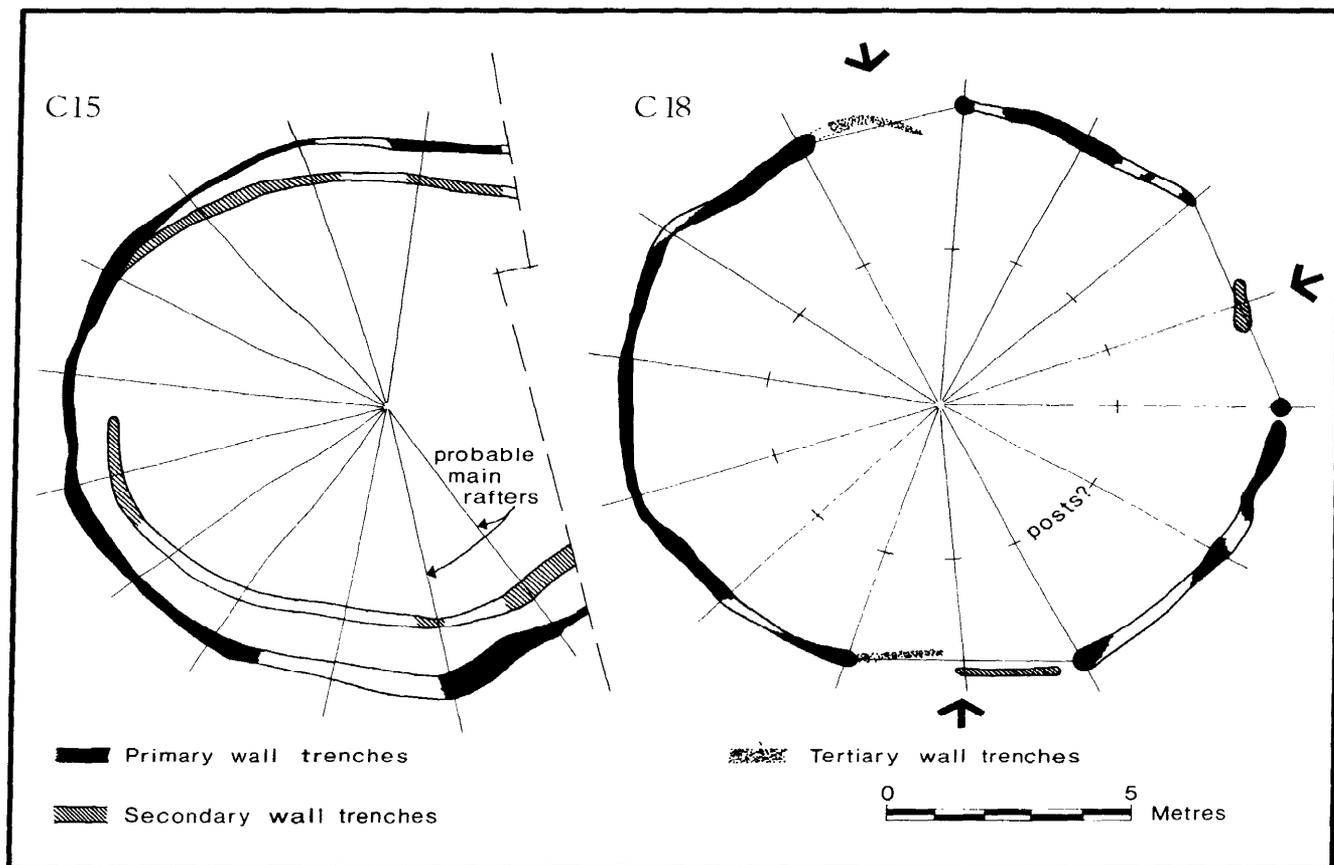


Fig 68 Little Waltham: interpretation of huts C15 and C18

was inserted in the eastern opening. These should belong to a period when the structure was beginning to deteriorate, and the beams spanning the openings were in need of support. Whilst this first alteration left the hut with its three openings, the second involved the virtual blocking of those on the north and south. In contrast to the earlier insertions, which were presumably load-bearing, these latter were set in very shallow trenches. The openings were not totally closed, for the eastern ends of these panels were turned inwards, so as to leave a gap about half a metre wide. Whether these were left to continue to provide ventilation, or conceivably to permit the egress of a shallow drain, it is impossible to say, but the latter seems unlikely since one would lead downhill, but the other uphill.

Hut C15 in its initial phase showed no evidence of having any entrances other than the presumed one on the east, beyond the limit of excavation. It is, however, possible that in its reconstructed phase the gap on the west represented an entrance, though in view of the lack of a comparable western entrance on the site this feature is more likely to be due to discontinuous reconstruction. One point is clear: the polygonal form is not confined to huts with more than one 'entrance' and a presumed special use. Nor are multi-entrance huts likely to be confined to group C; the group A hut, C17, seems to have had more than one entrance, though the interpretation of that complex structure will remain speculative until the western section is excavated.

Whilst a slight gully around the upslope side of the Period II huts was probable, to deflect storm water from the base of the walls, a drip gully in the conventional sense, without outlets, could do nothing but harm on the relatively impervious soil, and there is no evidence to suggest that any were present.

The huts of Period III offer an almost complete contrast to those of Period II. There is no direct evidence of the external wall, but instead the buildings are defined by a substantial gully originally some 0.85m deep. The presumption must be of a turf 'mass wall', partly using material excavated from the gully; if it was laced with timber the posts did not penetrate the subsoil. The turf wall hypothesis finds some support in the nature of the gully filling, described above (pp 32-4). The internal diameter of such a wall, not less than *c* 10m, would have been comparable with the smaller Period II huts. Some practical suggestions may be advanced to explain the existence of the gully, for example that the sand and gravel subsoil just here is more porous, beneath a thin capping of brickearth, whose removal might assist the drainage of storm water from a relatively flat site. Equally, its function might have been primarily to provide material for the hut wail; but if so, why keep it cleaned out? This particular area, of the site as a whole, might have been badly drained, but if so, why build there at all? It seems equally, if not more, probable that this radically different form of hut construction was the result of

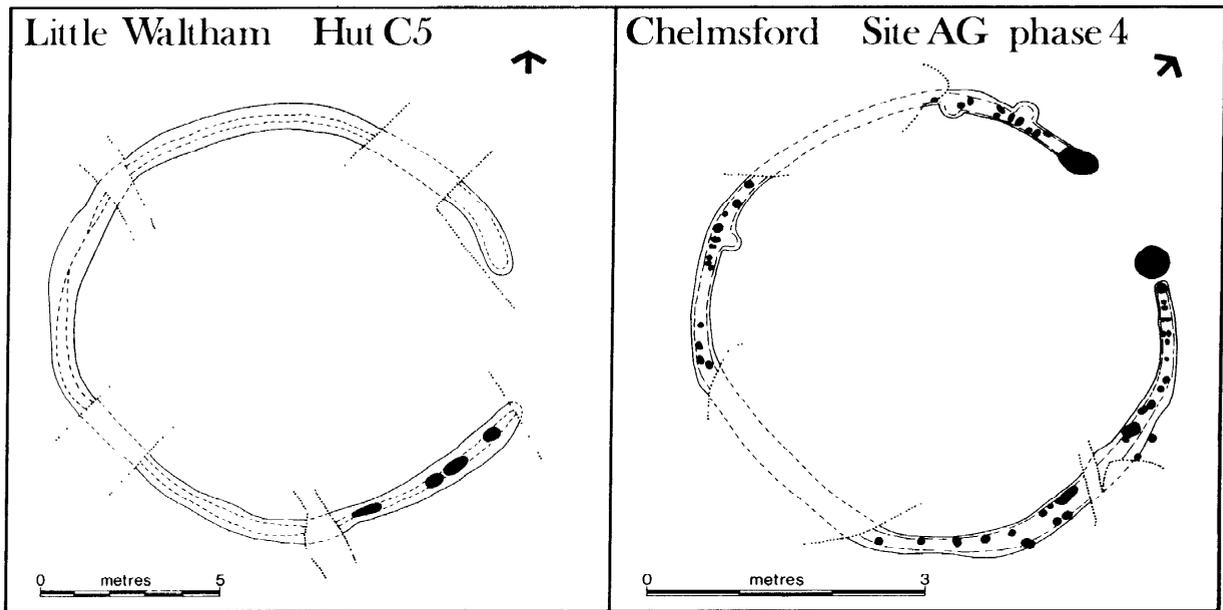


Fig 69 Comparative plans of subcircular huts at Little Waltham (C5, Period IV) and Chelmsford (site AG, phase IV); note difference of scale

fashion or individual preference, a topic to which we shall return below.

The hypothetical section (Fig 67) is based on hut C2; the assumption of a roof pitch of 45° produces an apex height of *c* 7.5m including thatch. Wall form 6 is simply a turf equivalent of a timber wall: but an alternative, consisting of an earth or soil bank revetted internally by a timber wall, perhaps of planking on a frame (wall form 5), is possible. This technique has been recorded in a primitive building at Bouleguy in Brittany (Meirion-Jones 1976, 49, and fig 3); there, the rafters (of a subrectangular building) do not extend over the bank, which is directly thatched to ground level. Such an arrangement would make a gully to carry away roof water desirable, and may explain the presence of such a feature in the Period III huts.

There is clear evidence in hut C2 of an inner ring of posts, represented by postholes set well into the subsoil; they were presumably present, in contrast to the Period II huts, because external walls of the type suggested did not provide the stability of the earlier timber walls. This hut seems to have had a porch extending through the gap in the gully, although in view of the disturbances by sewer trenches it is impossible to be certain. How the roof was carried over this the evidence does no more than suggest, but the simplest solution would avoid real valleys in the thatch. That the porch may not be a usual feature of Period III huts is suggested by the fact that hut C1 clearly lacks one.

There is a clear contrast between the widths of the entrances of the Period II and Period III huts; those of the latter are about half the width of those of the former. The interiors of the Period III huts must have been correspondingly darker, unless there was a substantial aperture at the apex. This would certainly have been possible, particularly if a small ring beam of withies was used at a relatively high level to space the rafters. If the purpose of the porch and resultant passage in C2 was to enable double doors to be fitted, either to prevent cold air sweeping in (Cunliffe 1974,

164), or to prevent a sudden draught which could cause a dangerous mass of sparks to be sent upwards to the thatched roof, possibly setting it on fire (Harding 1974, 39), it was clearly only thought to be necessary in one of the two Period III huts.

As Harding has recently suggested (1974, 40), these circular houses may well have been relatively sophisticated, well-finished structures. Huts C8, C9, and C17 in Period II are comparable in size with earlier Wessex houses, eg house 1 at Little Woodbury (14 m), Cow Down (Longbridge Deverill), Wilts. and Pimperne Down, Dorset (both *c* 15m), and although fewer structural features are overtly present, they may well have been comparable in form and finish. Structures of this size are not confined to the early Iron Age, as seemed the case until recently (Cunliffe 1974, 164).

Period IV was represented by a single circular house, C5, which in most respects was similar to the Period II, group B examples. It was, however, distinctly squarish in plan. The entrance seems to have been sited adjoining one 'corner'. This feature immediately suggested a comparison with a much smaller building of similar plan excavated in Chelmsford in 1975, the two plans being compared in Fig 69. The positions of many stakes of what must have been essentially a wattle and clay wall are clearly defined in the wall trench of the Chelmsford example, the only substantial posts present being those flanking the entrance. In contrast, the walls of Waltham hut C5 seem to have been of post and panel construction, to judge from the meagre evidence of four shallow post-impressions in the bottom of the wall trench. The implications of this similarity are discussed below (p 131).

In conclusion, it is clear that the style of the principal buildings on the site, the circular huts, changed considerably during the three periods of occupation. Indeed, the discussion above, of the implications of the different entrance widths of the Period II and Period III huts, suggests that the changes were more far-reaching than the

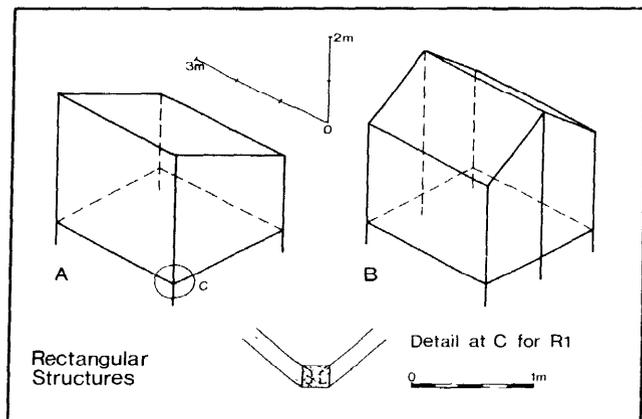


Fig 70 Hypothetical structural forms of four- and six-post rectangular structures at Little Waltham and elsewhere

surviving plan evidence at first sight suggests. Despite the use of the term 'hut' throughout this report, it should be borne in mind that these structures were substantial buildings, with a floor area approximately equivalent to that of a modern bungalow.

Rectangular structures

The function and interpretation of four-post structures has been the subject of much discussion (eg Ellison & Drewett 1971; Stanford 1970) and will be dealt with briefly here. There is no evidence that the Waltham structures formed the only surviving parts of larger buildings, nor, apart from the possible association of R7 with hut C5, is there any evidence to the contrary. The absence of pits for the storage of grain (precluded by soil conditions) suggests a function as granaries, but there is no other supporting evidence for such a hypothesis.

Four-post structures are generally assumed to have had ridged or pyramidal (hipped) roofs (the latter, for example, by Stanford (1970, 111) in his discussion of such structures at Credenhill Camp, Herefordshire). However, this seems to be a needlessly elaborate form of construction in view of the small span involved. In this connexion, it seems worth noting that in R3 postholes 152 and 156 are shallower, and apparently intended for smaller posts than 154 and 157; the pattern is repeated in R5, 181 and 192 being inferior to 180 and 183, and in R6, 191 and 192 being inferior to 190 and 193. This evidence could be interpreted as favouring a monopitch roof for these structures, the heavier and more deeply set posts indicating the higher wall (which, if the suggestion is correct, is not always one of the longer walls). Such an interpretation is shown diagrammatically in Fig 70A. If R7 is indeed contemporary with C5, one would expect it to have a monopitch roof sloping away from the wall of C5, to avoid storm water running between the two structures, although all its postholes are of similar size.

An alternative interpretation of the evidence from R3, R5, and R6 would suggest that these structures are illusory, each consisting of two two-post structures coincidentally a, bearing to form a more elaborate structure. However Table 3 (p 26) indicates that the ratio of long/short side in each case lies between 1:0.81 and 1:0.92; this correlation, together with the close parallelism of the sides, tends to make such a proposition most unlikely.

As Stanford (1970, 111) has suggested, one would

expect a ridged roof to be reflected in plan by six posts, the two additional uprights being placed centrally in the gable ends (Fig 70B). Such structures are known from Glastonbury, Tollard Royal, Rotherley (Stanford 1970, 126, and references cited) and Mucking (Jones 1974, 190). At Glastonbury (Bulleid & Gray 1911, pl XIV) and Mucking (Jones 1974, 190) there are also single examples of nine-post structures, which should perhaps be interpreted as having ridged roofs with an intermediate truss, as well as trusses in the gable ends. Indeed, the only small square buildings likely on structural grounds to have had a pyramidal roof are the three structures at Ivinghoe Beacon (Cotton & Frere 1968, figs 7,8), with a post at each corner and an additional one in the centre. Some 45 simple four-post structures had been published up to 1968, with a wide geographical distribution,⁵¹ and a further 14 have since been published (Jones 1974, 190) from Mucking alone: a case of the simplest form being the most common?

It seems worth noting that the four-post structures of Period III have sides of equal length, in contrast to those of Period II; there appears to be no obvious reason for the discrepancy. Building R1 is notable for its squared posts set diagonally to the main axes. Whilst this seems to imply fairly sophisticated carpentry, there appears to be no obvious structural reason for the feature (for suggested details of corner in plan, see Fig 70C). The other Period III structure, R2, is notable for the massive size of the timbers involved, which might suggest a second floor. It has been suggested (Ellison & Drewett 1971) that such massive structures on the periphery of a settlement might be watch-towers, but the position of R2 at the bottom of the valley slope tends to make the explanation unlikely in this case.

The rectangular building R4 is an unusual feature of sites of this period, but perhaps serves to remind us of the possibility of the existence of such structures alongside circular huts and four-post buildings. There is no reason to assume that the roof was other than a simple monopitch construction.

Two-post structures

Careful comparison of all postholes was made to determine the likelihood of their belonging to two-post structures, commonly interpreted as drying racks. A total of 34 such structures were recognized; these may be grouped by length and alignment as follows:

Length (m)	no of examples
A 2.00 ± 0.20	3
B 2.50 ± 0.20	14
C 3.50 ± 0.20	11
D 4.00 ± 0.20	3
Other	3
Alignment	
30°-70°	19
135°-170°	7
Other	8

Of the two factors, the latter seems to be determined by the dominant alignment of the settlement, which follows the contours of the valley slope. A little more than half are approximately at right-angles to this, and about half the remainder are parallel. Wind direction also probably influenced alignment.

The separation by length into two major and two minor groups would appear to be more significant, the varying lengths perhaps implying varying functions. The two most common functions seem to have required structures 2.50 or 3.50m long; the presence of groups rather than gradations of length appears to argue against the structures being merely larger or smaller versions for the same purpose. No

correlation could be detected between length and alignment. The results of similar analyses of examples from other sites may further assist the interpretation of these structures.

The form and economy of the settlements

Period II

In an introductory section it was suggested that the Period II settlement should be viewed as a continuously evolving entity, within which certain trends are clear. A sequence for the development of the circular huts has been proposed, which is unfortunately unsupported by stratigraphic evidence. However, it is to some extent reinforced by changes in the relative incidence of pottery types in huts of group A and groups B and C, the most significant difference being the relative decrease in the incidence of jars of form 1. Yet it seems erroneous to equate the three hut groups rigidly with chronological 'phases', particularly if the changes were, as seems probable, the result of indigenous development. Some support for this view seems to come from the fact that several group B huts (especially C4) tend towards an irregularly polygonal shape, which cannot be related to the suggested use of a wall plate in group C buildings, but which could be due to the superficial influence of group C huts already in existence. If the density of the huts within the postulated area of the settlement was approximately even, a total in the order of 30-35 for all groups seems likely.

Any discussion of the economic basis of the settlement is hampered by the fact that little is known of the topography of the surrounding area in the Iron Age; nor is it likely to be, given the intensive cultivation of the area over many centuries, and the fact that clay by itself does not produce 'crop' marks that are easily interpreted from the air. A field system in the valley can be shown to be pre-Roman, but it seems unlikely that, in the form in which it is now detectable, it belongs even in part to this period, although such a possibility cannot be entirely ruled out. However, the existence of the site on clay need cause no surprise, for in recent years several have come to light in Essex, for example, at Langdon Hills and Wickford.⁵² The apparent tendency of Iron Age sites in the area to occur on gravel and sand is probably due partly to the relative ease of their identification from the air, and the scale of gravel extraction. There is no definite agricultural equipment amongst the ironwork, although it is conceivable that object 5.22 is the tip of a ploughshare, and object 5.16 (Fig 59), together with some of the nondescript fragments of heavy plate, are parts of plough- or ard-shares of the type illustrated by Payne (1947, fig 1.10-16) and by Modderman from the Spanjaardsberg (1961, 247; fig 34).

It is to a gravel terrace site, at Mucking on the Thames, that one must turn for a local parallel to the open settlement. The basic difference between the two sites, at the period under discussion, seems to be that on the flat open heath of Mucking there was less incentive towards close grouping than at Waltham, where it is possible that much initial clearing was necessary. Indeed, the observed relatively lavish use of timber in the group A huts may reflect this. However, a group of more than 15 huts 'centred on 1150 × 250' (Jones 1974, fig 3) is reminiscent of the unenclosed Period II settlement, although their relationships to the relatively small enclosure in the same area will only be clear when the site has been fully published. Elsewhere, the 6.5 ha settlement on Boscombe Down West appears to be unenclosed (Richardson 1951) as do some sites in the upper Thames Valley (Harding 1974, 26).

The acid soil destroyed most faunal remains other than

teeth, so that it is possible to say only that cattle, horse, sheep, and pig remains were present. The apparent predominance of cattle over smaller animals is probably due mostly to the fact that larger teeth survive more readily. Possible evidence of the splitting of long bones to extract the marrow comes from hut C15. No pens or enclosures of Period II were found which might be associated with stock; it is, however, possible that these lay some distance from the occupation area. Huts within small enclosures, exemplified in the area by the apparently isolated farm at Ardleigh (Erith & Holbert 1970) and the group at Mucking (Jones 1974, fig 4), do not occur. It is possible to say no more at present than that the different layouts probably reflect differences in the economy of settlements of this period.

The absence of storage pits of the type well known in other areas is probably due to the nature of the subsoil, for excavated pits tended to be full of water during and immediately after periods of wet weather. The only pits which resemble the normal type of storage pit are 163A, B, and C; the fact that basically one pit was recut twice should imply that it was connected with some successful operation, but what it was the evidence does not tell us. Despite the lack of direct evidence, some at least of the four-post structures were probably granaries, for the method of storage they imply seems to be the only practical one on this site. Whilst it has been suggested that there were at least two major uses for the two-post structures commonly interpreted as drying racks, there is no evidence to suggest what those uses were, nor the function of the many isolated posts,⁵³ though both may have had some share in drying cereal crops. It is possible that some two-post structures within huts may have been contemporary with them, and are to be interpreted as looms; some fragments of triangular clay weights, conventionally loomweights, were found but not in association with the structures. Oats and wheat are attested in the charred material from hut C11, but this sample from a single context may not be a reliable guide to the range of cereal crops grown.

The pit 162 may have begun as a quarry for brickearth, for daub; one would expect more, but these may have been peripheral to the settlement. It must belong in its initial phase with the group A huts. Features 162A and 175 were small pits lined with clay, doubtless to hold water, or a slurry, for some specific purpose, possibly connected with potting (p 30). The buried pots 168 and 176 are enigmatic. If they are contemporary with the huts in which they were found, they seem too small to be practical containers sunk into the floor. Whilst one might suggest a votive function, a more prosaic solution is possible—were they, for instance, mouse traps? The profile of 168 would certainly prevent any mouse from climbing out having once fallen in.

The pottery fabrics were initially classified by visual criteria; and despite the fact that scientific techniques have made it possible to classify the coarse wares in quite different ways, it is felt that the type and finish of the fabric, as assessed in the hand, has a unique validity as the only means of distinction (other than by source) available to its original users. The scientific evidence shows that it is possible to produce a visually similar result from demonstrably different clays: the point is illustrated most acutely by fabric G, where both petrological examination and X-radiography have indicated considerable differences between individual vessels. This must be largely due to the inconsistent selection of local materials, but the two sherds that have been shown to contain volcanic grains (p59 above), and any others which may prove to be similar, could be of foreign origin.

The relatively fine distinctions which can be drawn between the various 'coarse' fabrics by the use of compara-

tive X-radiography are in this case related more to the radiopaque particle size and distribution within the clay, and its subsequent working and tempering, than to the basic petrological characteristics of the material concerned. One can suggest various reasons for the differences detected at this level of perception; as Leo Biek points out (p 60 above), there are, as one might expect, correlations between the size and complexity of vessels and the clay used by potters to produce them. At a more individual level, each producer no doubt exercised personal preference in the choice of clay for his or her own use, and indeed such choice may be partly responsible for the comparatively large number of radio-fabrics detected, given the long period of occupation with which we are concerned. It is certainly noticeable that some hut assemblages contain an idiosyncratic choice of vessels, in terms of preference for particular forms and sizes within a consistent overall style, a phenomenon due, no doubt, to the preferences of the occupants or the activities undertaken in the hut.

In some cases such assemblages belong to a relatively narrow range of radio-fabrics, implying perhaps an equally small number of people responsible for their manufacture. As yet there are too many variables, and too little statistical evidence exists, to enable any conclusions to be drawn about the organization of pottery manufacture in Iron Age settlements of this type, although the data presented in this report may become more useful in the light of future work.

However, the majority of the pottery—fabrics G (largely), H, and J certainly—appears to have been manufactured locally, probably indeed on the site itself. Non-local fabrics A and D reached the site in Period II, although in relatively small quantities, accounting together for only 2.2% of the illustrated material. In Period III ‘non-local’ pottery (p 56) became much more common, accounting for 11.9% of the relevant illustrated vessels. Fabric A was the most common; fabrics B and D remained scarce, whilst the sole example of fabric C appears in this period. The evidence thus seems to point to an increasing volume of trade outside the immediate area of the settlement, at least so far as ceramics were concerned.

Period III

The Period III settlement was markedly different from its predecessor. The evidence for the succession unfortunately rests on one relationship, but is reinforced by the evidence of the pottery. The obvious differences lie in the form of the circular huts, and the fact that the later settlement is enclosed, although there may be a more basic difference of scale and population (below, p 129). The enclosure seems to have been formed by a palisade, but the possibility is admitted of the apparent trench 253 being a ditch, despite its steep sides and near-sterile fill. Only the location and excavation of the entrance can settle the matter with certainty.

Assuming that the interpretation as a palisade trench is correct, the enclosing structure could have taken one of two forms: either a simple palisade or a palisade revetting a turf bank. There was no flanking ditch. Of the two, the latter may be more probable, since even after dismantling, or decay, a bank would be left sufficient to act as a barrier to fluvial erosion on the east, and thus ensure the survival of the line to the present day. The later field ditch, dug outside the bank, would tend to coincide with the original palisade trench, assuming a certain amount of erosion in the period between demolition of the enclosure and the digging of the ditch. Its presence need not imply an original bank and ditch form of enclosure.

It is also worth noting that with the exception of post-holes 59 and 60, probably of Period II, a zone 8-10m deep

inside the line of feature 253 is clear of features: this could well indicate the site of an internal bank. The ‘salient’ in feature 253, located on the south-east under the modern ditch 254, is an interesting feature which may imply some elaboration of the structure at this point, though in what way is uncertain. The location of the site and the relatively slight form of the perimeter does not suggest a serious defensive role; it would do little more than keep in stock, and keep out wild animals and occasional intruders. It is, however, more substantial than the presumed stock enclosures to the south, and thus might be seen as having a more important role than merely stock control and protection. Two basic interpretations of the enclosed settlement are possible. Firstly, it could be a single farmstead of the Little Woodbury or Tollard Royal type (Bersu 1940; Wainwright 1968) containing one, or at most two, contemporary huts and much open space; or secondly it could be a small enclosed village, differing from the Period II settlement largely in the fact that it was enclosed. Examples of this latter form of settlement occur at Colsterworth, Lines, and Draughton, Northants (Grimes 1961). Only further excavation can determine which was the case at Waltham.

Much that has been said of Period II features applies equally to those of Period III. Little can be said of the economic basis of the site, cattle and horse bones only surviving. The (presumably) U-shaped enclosures to the south of the settlement seem to be stock pens; though defined by timber slots, the implication need be of little more than substantial timber fences. If they were intended for a particular animal, its identity is not clear; Mrs Jones (1974, 190) has suggested that similar features at Mucking were sheep folds, the open ends being closed with hurdles.

The presence of fragments of bloomery iron (p 115 above) in the gully around hut C2 provides evidence of iron smithing on the site in this period, although no other trace of such activity was found; any associated features were probably entirely above ground level.

Period IV

The Period IV settlement, consisting within the excavated area of a single hut whose siting takes account of an earlier enclosure, is enigmatic. Again the ceramic evidence points to no great lapse of time between the two, but it does include ‘early Belgic’ and other contemporary forms. Though only more extensive excavation can decide the point with certainty, hut C5 seems more likely to represent a single farm than part of a large settlement.

One point which deserves comment is the fact that pits tend to be associated with this hut, but whether they were storage pits in the accepted sense seems doubtful. It is also interesting to note that the hut, despite its tendency towards a squarish shape, is basically similar to the Period II, group B huts; this might point to a survival of earlier techniques at a lower social level than that represented by the enclosed settlement.

Dating and cultural affinities

An approximate estimate of the duration of each phase may be made, using the conventional assumption of 25-30 years as the life of a timber building whose main structural elements are set into the ground. Difficulties arise, however, in the absence of overall stratigraphy and full excavation; it is impossible to determine with certainty the number of successive buildings in each phase. Nonetheless, one might suggest on this basis that Period II lasted about 100-150 years, Period III about 50 years, and Period IV about 20-30 years. If the dating of Period IV to the third quarter of

the 1st century BC is correct (p 133 below), Period III would occupy the first half of the 1st century BC, and Period II would begin during the mid-late 3rd century BC.

Four carbon-14 dates are available from the filling of the wall trench of hut C11, which belongs to the earliest group (A) typologically defined within Period II. Two dates, obtained from samples containing a modest proportion of charcoal mixed with the soil filling of the wall trench, gave rather early dates: 3340 ± 90 bp (HAR-1082) and 2560 ± 80 bp (HAR-1081). These may well be due to the presence of charcoal residual from the earlier, Neolithic, phase of occupation, an intermediate date being produced from the mixture. The remaining two, however, taken from lumps of charcoal, gave determinations of 21602 ± 80 bp (210bc; HAR-1088) and 2100 ± 70 bp (150 ± 70 bc; HAR-1120). The mean of these two dates is 180 ± 55 bc, which, when corrected using the 5730 half-life and the Daman, Long, and Wallick calibration curve, suggests a calendar date of 234 ± 55 BC.⁵⁵ This is in reasonable agreement with the structural evidence; both approaches suggest a 3rd century BC origin for the Period II settlement.

Cunliffe (1968; 1974, 39) has defined a ceramic style, the *Darmsden-Linton* style, common to settlements in Eastern England, from the Wash to the Thames Valley, and typified by a large assemblage of pottery from pits at Darmsden, Suffolk. Material of this type has been published from Linford/Mucking, on the north bank of the Thames estuary (Barton 1962; Cunliffe 1968, 180) and has recently been identified at Maldon and Saffron Walden,⁵⁶ further north in Essex. On the basis of similarities to La Tène I types on the continent, Cunliffe suggested a late 5th to 3rd century date for the style. Barrett, however, in a recent review of the continental evidence, suggests that this 'La Tène influence horizon' could have appeared as early as the beginning of the 5th century (Barrett 1978). Elsewhere, (Drury 1978, 73-4) it has been suggested that in this area, the *floruit* of Darmsden-Linton fine wares probably centres on the 5th century, and that during the 4th century fine wares becomes less common, and finger-tip decoration disappears from the body of the coarse jars, now being confined to the rim; but virtually all pottery continues to be flint-gritted. Such material has yet to be published in quantity, but groups from Stock (Hedges 1977) and Rivenhall (Rodwell & Rodwell forthcoming) may be typical.

Similarities between the Darmsden-Linton style and the Waltham assemblage are few. Our no 19, from Hut group A, Period II, which falls outside the normal range of Waltham forms, but is clearly related to the rare form 16, finds a parallel at Darmsden (Cunliffe 1968, fig 3.35) and our form 1, seemingly derived from the sharp-shouldered, situlate jars found in the Darmsden range (*ibid*, fig 2.10-16), becomes rapidly less common as the site develops (Fig 39). Jars with a relatively weak profile are present in pit 1 at Darmsden (*ibid*, 184-7) but the outstanding characteristics of the group—sharply angular bowls, often with horizontal grooves above the carination, finger-tip and other decoration on the body of the jars, which typically have a relatively tall, generally out-turned rim—are elements totally absent from Waltham. Whilst Darmsden-Linton material from Essex is usually flint-tempered, the fine wares are not inferior in quality to the Waltham material; indeed, they are usually thinner, harder, and better finished than all except the non-local Waltham fabrics. The difference is clearly not due to superior technology or skill; indeed, almost the reverse seems to be true.

On the basis of a review of the relatively modest amount of evidence yet available from Essex (Drury 1978), the principal difference between Early and Middle Iron Age settlements seems to lie in the structural details of their

round houses. In contrast to those at Waltham, early houses (eg Linford: Barton 1962, 61 and fig 2; Heybridge: Drury 1978, fig 3) tend to be relatively small, oval rather than circular, and defined by postholes generally representing the line of the outer wall, but occasionally perhaps the line of an intermediate ring of posts supporting the roof. It seems probable that as with later examples (above, pp 120-3) it was only considered necessary to set one or the other deeply into the ground.

The Waltham pottery style is part of a wider grouping in eastern England, in which the bowl form predominates, in contrast to the saucerpot form of central southern Britain (Cunliffe, 1974, figs 3.5, 3.7). In an earlier section, the material from Waltham was analysed, according to shape, decoration, and fabric, to ascertain whether any changes could be detected in the composition of the three period groups. There is no evidence of dynamic development of the style even during Period II; it had clearly reached maturity elsewhere, before appearing at Waltham in the 3rd century BC. The slight evolution observed during Periods II and III may reflect merely the development of taste or preference within an individual community. Only the detailed publication of other sites in the region can determine whether the pattern demonstrated at Waltham is specific to that site, or typical of the area as a whole. A similar form of slow evolution is suggested by the structural analysis of the circular huts of Period II.

As a preliminary to the comparison of the Waltham pottery with that from outside Essex (its similarity to local material from Ardleigh, Chadwell, and Linford-Mucking, has already been discussed, pp 52-6 above) it is necessary to describe the distinctive elements which make up the style. These are as follows:

- 1 The everted-rim footring bowl, F13, always plain; elements of its shape appear to be present in F5, and to a lesser extent in F3.
- 2 The tripartite, but not angular 'debased situla' form, which is the basis of forms 1 and 2 and influences F12.
- 3 The tendency, especially in the smaller jars, towards a marked shoulder line, the profile of the vessel above this assuming a concave form, ending vertically or sloping outwards. This feature is especially marked in forms 8 and 9.
- 4 The presence of vertical scoring or other emphasis, often combined with finger tip decoration of the rim.
- 5 The occasional presence of vertical-sided vessels, forms 7 and 10.
- 6 The occasional presence of bowls with inturned rims, form 15.

The tripartite jar (2), vertical and random scoring, occasionally combined with more definite patterns (4), and the tendency towards a shoulder line (3) are all present in the material from Breedon Hill, Leics, although the latter feature appears to be rather less marked than at Waltham. Indeed, the material from Breedon Hill is remarkably similar to that from Waltham, with the notable exception of the absence of everted-rim footring bowls and vertical-sided vessels (Kenyon 1950, 25-35).⁵⁷ Many of the jars at both sites have splayed, heavy bases, and there is a parallel for the rare Waltham F15C at Breedon (*ibid*, 33, fig 5.17). Cunliffe (1974, 40) groups this material with that from Ancaster, Lines, as the Breedon-Ancaster style. Dating evidence from work at Ancaster, and from later work at Breedon Hill (Wacher 1964), suggests an origin in the 3rd or 4th century BC for this style (Cunliffe 1974, 40). Coarse ware in the Breedon-Ancaster style has been shown by Cunliffe (1974, fig 3.7) to occur from Lincolnshire south to the Thames in Buckinghamshire, sites at Hardingstone, Northants (Woods 1969; group 1, figs 8-9a, probably 1st

century BC), Twywell, Northants (Harding 1975), and Aldwick, Barley, Herts (Cra'ster 1961, figs 7,8) having produced substantial groups of comparable material. Eastwards it is known in Suffolk, and from Norfolk largely on the evidence of such sites as Runcton Holme and Eaton Heath, Norwich (Clarke 1939, 46; Gregory, in Wainwright 1973, 31, fig 17), and it would seem reasonable to include the non footing-bowl element of the material from Waltham and the other Essex sites where similar pottery occurs in the same general group.

The obvious connexions of the vertical-walled vessels (form 10) seem, superficially at least, to be with the saucepan pottery of central southern and western England, although the rim and base forms seem to have more in common with the remainder of the Waltham assemblage than with saucepan pottery proper. In view of this, it seems unwise to stress the similarity. A connexion between Waltham F15A and the barrel jars of the upper Thames region, from such sites as Yarnton, Cassington, and Stanton Harcourt (Harding 1974, 193), is possible, but a parallel for Waltham form 15C can be found at Breedon Hill (noted above), so that again it seems unwise to stress the similarity. Indeed, it seems preferable to regard these rare forms as occasional instances of inventiveness on the part of the potters or, in the case of form 15B, perhaps lack of skill or care.

The everted-rim footing bowl is a major element in the middle pre-Roman Iron Age pottery of the south-east. Ward-Perkins (1944, 143-6) first drew attention to its distribution south of the Thames, in Surrey, Sussex, and Kent; he regarded it as typical of a Wealden culture emerging early in the 1st century BC. Hawkes (1939, 237-8) sought to derive the form from earlier ('Marnian') pedestal base vessels, for example, those found at Park Brow, to which a date in the 3rd century BC was ascribed. Cunliffe (1974, 38) points out that the silver ring from Park Brow could hardly have been imported before c 270 BC,⁵⁸ and suggests that his 'Park Brow—Caesar's Camp' ceramic group, of which the pedestal vessels noted form a part, belongs to the 5th to 3rd centuries BC.

It is now clear that these bowls occur in substantial numbers north of the Thames. On the north bank itself, the form occurs at Mucking (Jones *et al* 1968, 214), Chadwell (Manning 1962, fig 4. 13-17), and Gun Hill (Drury & Rodwell 1973, fig 14. 34-42); further to the north, at Waltham, Heybridge, and Wendens Ambo,⁶⁰ at Aldwick, Barley, Herts (Cra'ster 1961, fig 8.84-6); and in Suffolk at Buntley (Cunliffe 1968, fig 5.70). Furthermore, they are present at Waltham in the earliest group, to which a 3rd century date has been ascribed. The Thanet Sand, which outcrops on the north bank of the Thames, in the Mucking-Chadwell area, is the nearest source of the glauconite detected by Dr Peacock in fabric A. Moreover, vessels in this fabric occur in profusion on sites in that area, becoming steadily more scarce both to the north and to the south, despite the availability of glauconitic deposits in the latter area, where, however, other similar Iron Age fabrics containing glauconite occur. It thus seems reasonable to conclude that, of the vessels in non-local fine fabrics present at Waltham, the majority, in fabric A, originated on the north bank of the Thames, in the Mucking-Chadwell area. Figure 71 forms a provisional distribution map of sites producing sherds of fabric A.

It is clear, therefore, that fine ware vessels of this form were being manufactured on a commercial scale on the north bank of the Thames by the later 3rd century BC. It has been noted by Peacock (1969, 54) that elsewhere in Britain the distribution of commercial products of this type seems to take little regard of cultural boundaries, and these

vessels would seem to provide another illustration of this phenomenon. South of the Thames, at sites like the Caburn, Sussex, bowls of this form occur with the saucepan pots typical of that area and, as Hawkes (1939, 245) pointed out, gave rise to some hybrid shapes in local wares. At Waltham not only were the fabric A footing bowls extensively copied in local fabrics, but, as we have seen, other forms incorporated some of their characteristics.

Vessels with pedestal or footing bases occur in several groups of Iron Age pottery for which an origin earlier than the 3rd century BC can be suggested, both to the north and south of the Thames. Hawkes's suggested derivation of the footing bowls has been noted above; one may also point to such vessels in Cunliffe's *Chinnor-Wandlebury* (1974, fig A10.25; for Wandlebury, see Hartley 1957, 16-24) and *Darmsden-Linton* groups (for Linton, see Fell 1952, 34-9). These vessels are, however, all more or less angular in profile; the derivation of the footing bowl in the lower Thames area is as yet uncertain. If, however, the form was a commercial innovation, it may have been introduced or developed by a single craftsman or group familiar with a range of pottery styles, as a form potentially saleable over a wide area. The north bank of the Thames, with easy access to water transport and probably located on the boundary between two cultural groups, seems to be the ideal site for such an enterprise to develop. Much more work is required before the manner in which the form was diffused northwards can be assessed with any certainty. It may be significant that Buntley, which produced a typical example of this form (see above), is close to the coast. The type also occurs in Lincolnshire, particularly at Ancaster, but is absent from Breedon Hill and the upper Trent Valley sites described by Kenyon (1950).

The petrological study of the Waltham fabrics indicated that two of the four vessels in fabric G which were examined contained volcanic minerals not seen in the (single) thin section of the local brickearth. Subsequent X-ray examination of all illustrated vessels failed to isolate this subgroup (p 62 above), but in any case it is reasonable to suggest that local pots would be copies of any non-local ones present—a model analogous to that proposed for the everted-rim footing bowls above. In this case, however, the difference in quality and appearance is not marked; indeed, the two groups are visually indistinguishable. Dr Peacock's suggestion that some vessels in fabric G might have originated on the other side of the North Sea prompted a search for comparable material in geologically likely areas. One such region was the alluvium of the lower Rhine area, which contains minerals eroded from the Eifel massif.

Cunliffe (1968, 178) has noted the apparent connexion between the Darmsden material and that from the adjacent continent, in particular with the material from the first four phases of the Spanjaardsberg, Santpoort, Holland, dated by Modderman (1961) to the early La Tène period, and subsequently classified by Waterbolk (1962) as Ruinen-Wommels II ware. Its successor, Ruinen-Wommels III ware, lacks the angular forms, and the style thus bears a close resemblance to the coarse ware elements of the Waltham assemblage. It is found in northern Holland (Waterbolk 1962, 40, fig 32) and at 10-15 sites along the west coast.⁶¹ Carbon-14 dates obtained from Ruinen-Wommels III sites (Jelgersma *et al* 1970, 142) suggest that the style originated during or before the 4th century BC; and it seems to have been current until the early 2nd century BC, when *streefband* pottery was introduced.

Typical Ruinen-Wommels III pottery has a high shoulder, well-defined, often by a line; from shoulder to rim, the vessel assumes a single concave moulding. This feature has already been noted as a characteristic element in the Wal-

tham style (p 127, no 3). Geometric decoration occurs; a design similar to our no 98 occurs at Tritsum (Waterbolk 1962, fig 31.10).

The Ruinen-Wommels III material from periods 5 and 6 at the Spanjaardsberg (Modderman 1961; also Waterbolk 1965-6, 29), though limited in quantity, shows a wider range of shapes, particularly the 'slack S' profile which encompasses many of the Waltham forms. Bowls with incurving rims (Waltham form 15a) occur (Modderman 1961, fig 25.3), as do large jars without curvature in the lower parts of the walls as Waltham form 10 (*ibid*, fig 25.11, 26.12), vertical emphasis (*ibid*, fig 25.3), and triangular clay weights (*ibid*, fig 25.7, 24.8). Vessels similar to Waltham form 1 are well represented in the more numerous Ruinen-Wommels III material from period 2 (Modderman 1961, fig 5.16). An insular derivation from Darmsden-Linton forms, proposed earlier (p 127), whilst perhaps remaining the most likely origin of this form, is thus by no means certain.

Despite its appearance at the Spanjaardsberg, however, vertical emphasis or scoring is not a common element in the Ruinen-Wommels III style; hence it may be significant that it is absent from vessels in fabric G at Waltham save for the faint emphasis on Fig 43.41. The only fabric G vessels with scored decoration of any sort are Fig 45. 98 (mentioned above) and the apparently randomly scored Fig 45.101. It is perhaps worth noting, however, that vertical, horizontal and random scoring (together with coarse stabbing) are found on contemporary pottery further south, in the lower Rhine area; for example, the material from the middle pre-Roman Iron Age settlement at Das Kamps Veld in Haps, deserted in the mid 2nd century BC (Verwers 1972. 95-114).⁶² However the pottery is generally less closely comparable with that found in eastern England, so that it would be unwise to emphasize this point of similarity. Further study of the relationship between the Iron Age pottery of East Anglia and Holland is envisaged, to form the subject of a separate paper in due course.

Whether the enclosed settlement of Period III represents a single farmstead, or is an enclosed version of the open settlement, the provision of an enclosure should be a reflection of the needs and practices, particularly the agricultural practices, of the community involved. There seem to be four basic explanations, not necessarily mutually exclusive, for the observed changes. Firstly, if the enclosed settlement was a farmstead, it is possible to explain the transition from open village in socio-economic terms.⁶³ The increasing quantity of non-local pottery, reaching the site during Phases II and III, provides almost the only available pointer, but nonetheless a positive one, towards increasing economic prosperity. Such prosperity should lead to population expansion, and this in turn to increasing pressure on, and eventually perhaps the exhaustion of, the local arable land. This could logically cause village communities to split up, possibly even into single farms, and spread out over a wider area. The village could thus have divided, leaving perhaps only one or two families on the original site. The increasing pressure on land might tend to cause aggression between neighbours, thus providing a suitable context for a palisaded enclosure capable of protecting stock and keeping neighbours out. However, this hypothesis fails to explain the different technique of hut construction used, and if the Phase III settlement was an enclosed village rather than a single farmstead, it becomes untenable except insofar as an increase in population, ie of pressure on the land, might give rise to a need for defensible settlements.

Secondly, changing agricultural practice could be involved, and here one must deplore the fact that soil condi-

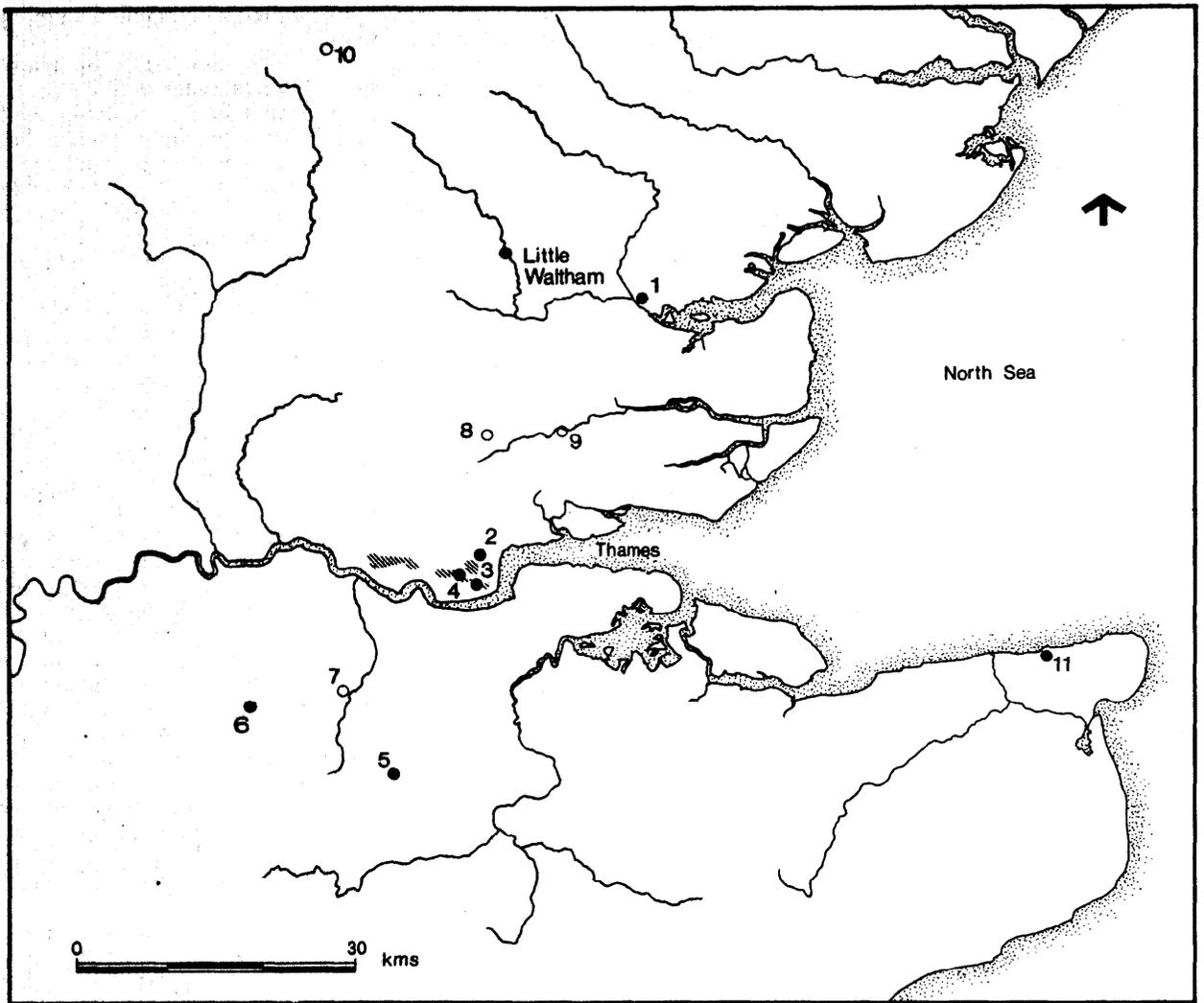
tions are generally hostile to the survival of faunal and environmental evidence.

Thirdly, a recent and important paper by Warwick Rodwell suggests an explanation in terms of the changing political background of south-east Britain during the late 2nd and 1st centuries BC. The distribution of Gallo-Belgic A coins in north-east Essex is seen to suggest that one area of primary Belgic colonization was centred on Colchester, and extended south-westwards approximately to the Chelmer. According to Allen's generally accepted hypothesis, these coins belong to the last two or three decades of the 2nd century BC. The distribution of Gallo-Belgic E coins in the area also appears to lie to the north-east of the Chelmer. This and other evidence is seen to combine to suggest a situation where, in the middle of the 1st century BC, the Chelmer forms in part the boundary between the Belgic Trinovantes in the eastern area of Essex, and the indigenous Catuvellauni in the interior. The distribution of Birchall's 'earliest' and 'early' types of 'Belgic' pottery was also shown, on available evidence, to lie largely outside the probable Catuvellaunian area (Rodwell 1976, 183-211). The relevance of this hypothesis to the Period III settlement at Waltham is immediately obvious. Waltham would lie in a 'border' region between an area of primary Belgic settlement and an area apparently still not under Belgic domination at the time of the Caesarian invasions. This would provide a suitable context for the enclosure of the settlement, whatever its form. Lightly defended settlements or defensible houses are a feature of border areas when an uneasy peace reigns, for example, the bastles of the English/Scottish border area (Ramm *et al* 1970). Neither by its siting nor its design was the Waltham enclosure intended to withstand military attack; it would merely have provided protection against occasional intruders or unfriendly neighbours. Such circumstances would also provide a situation favourable to the introduction of a new house-type into the area.

Finally, it is possible that the settlements—not only of Periods II and III but also of Period IV—may represent different social levels; the differing proportions of fine to coarse pottery could be relevant here.

Whatever the reason, or combination of reasons, there is a general trend towards enclosure at this time, whether of habitations (eg Waltham, Ardeleigh, Mucking) or stock (eg Gun Hill, with an enclosure linked to a droveway). More correctly, ditched enclosures, traceable in the archaeological record, appear: if earlier enclosures were defined by banks or hedges or both, they would leave no trace. The changing form of Iron Age settlements in the region is discussed further in Drury 1978, esp 71-6.

During Period III, the pottery continued in the style prevalent in Period II, without discernible 'Belgic' influence, thus presenting a strong argument for cultural continuity. There is, however, an increase in the proportion of the fine fabric A, from Thameside. That this is due to the continuing development of a commercial enterprise can hardly be doubted, for the distribution of these vessels (Fig 71) includes that part of Kent where the earliest Gallo-Belgic A coins circulated, as well as the non-Belgic areas of Essex. Its probable area of production seems to fall on the periphery of an area of early Belgic settlement suggested by the distribution of Gallo-Belgic A_b coins. Since the earliest pottery which has tentatively been called 'Belgic' is relatively crude (Rodwell 1976, figs 15-17) these fine vessels doubtless found a ready market in both Belgic and non-Belgic areas, until the advent of finer pottery of Aylesford-Swarling type. The appearance of other non-local fine wares (eg fabric B) at this time should also probably be seen as the result of trade, perhaps with more



● Present ○ Absent ▨ Occurrence of Thanet Sand North of River Thames only

Fig 71 Map showing the distribution of vessels in fabric A in the lower Thames Valley. The sites are as follows: 1, Heybridge; 2, Mucking; 3, Chadwell St Mary; 4, Gun Hill; 5, Oldbury; 6, Holwood, Keston; 7, Eynsford; 8, Billericay; 9, Wickford; 10, Wendens Ambo; 11, Birchington

distant centres. Thus the ceramic evidence might be interpreted to suggest that the Period III settlement was non-Belgic, and culturally similar to its predecessor.

Within the basic concept of a circular house, regional types must have evolved, peculiar and eventually traditional to particular areas and communities. For example, there is a contrast between the details of round houses found at Mucking and Waltham of approximately the same time. Indeed, the Period II houses at Waltham seem to provide a good example of local evolution and improvement, three stages being discernible in what was probably a continuous process. A sudden and complete change in technique, however, demonstrated in the differences between the huts of Period II and III, seems to imply that people from a different area, with different traditions, or just possibly from a different stratum of society, were responsible for their construction. An alternative explanation is, however, possible. It may be that there was a

considerable break in occupation between Periods II and III, the hut form evolving elsewhere. But neither the ceramic nor the structural evidence points to this, and the changes were so substantial that a long interval would have been necessary. Whatever the reasons for the change, it is emphasized by the different siting of the Period III settlement. It is also relevant to remember that the Period IV hut (C5) seems to represent a final stage in the evolution of the Period II form of circular house, further stressing the locally intrusive nature of the Period III structures. Lest it be thought that different forms of circular rather than rectangular buildings are unlikely to be Belgic innovations, we should remember that Strabo says of the Gauls, 'Their houses are large and circular, built of planks and wickerwork, the roof being a dome of heavy thatch' (*Geography*, 4, IV, 3). The houses of Period III at Waltham are certainly large and circular, although the form of the walls does not seem to be closely comparable (but see above, p 123).

Unfortunately, archaeological evidence of circular buildings from the relevant areas seems, as yet, to be sparse, although Harding (1974, 48-51) points out that round houses are by no means unknown in the north-western coastal areas of Europe.

In the light of such conflicting evidence, the status of the Period III settlement must remain in doubt. It may be that Rodwell (1976, 225-34) has taken too optimistic a view of the early date of 'Belgic' coarse wares; equally, in the light of further excavation, the different hut forms represented may be seen to be parts of a single local tradition. Only through much further work, particularly large-scale settlement excavation, will an overall picture be provided against which the Waltham site can be assessed.

A single sherd of pottery decorated with cross-hatching (Fig 48.192) was found in a Period III context: it is the sole example of the 'curvilinear' style of decoration from the site. The forms of such decoration occurring on Iron Age pottery in Essex have recently been discussed by Drury and Rodwell (1973, 93-4). This material has a coastal distribution in the area, being found frequently on Thameside sites, and to a lesser extent along the east coast and its tidal estuaries (eg at Wickford, Heybridge, and Langenhoe). Its representation at Waltham by a single vessel is therefore not surprising; only Heybridge has yielded a comparable cross-hatched sherd (Drury & Rodwell, 1973, 94). Petrological examination of another, undecorated, sherd of fabric B has failed to suggest its source. There is, however, no reason to doubt the conclusion reached by Drury and Rodwell that vessels of curvilinear group 5, to which the Waltham pot seems to belong, are unlikely to have been manufactured in central Essex.

The Period III settlement was eventually abandoned, the sole evidence for its successor being provided by a single hut, C5, and its associated features. This—the Period IV settlement—shows distinct 'Belgic' influence both in its ceramics and in the form of the hut. There is a growing body of evidence which suggests that some 'Belgic' houses in the area were rectangular structures, occasionally evidenced by wall trenches or postholes (eg at Mucking: Jones 1974, 186, 190), but more usually fully-framed and thus represented largely by negative evidence (eg at Kelvedon: Rodwell & Rodwell 1975, 26). The subcircular form of the Period IV house suggests that its builders may have been influenced by rectangular structures, but that their traditions were essentially those of the 'pre-Belgic' Period II settlement. This structure seems to represent the final development of the type, for a subcircular building excavated in Chelmsford (*Caesaromagus*) and datable to the third decade of the 1st century AD, was of the same form; their plans have been compared in Fig 69. The Chelmsford structure was much smaller, and could have been no more than an outbuilding, constructed in what was by then an archaic vernacular tradition. The continuing use of primitive buildings, generally as pigsties, in Brittany, long after their abandonment for other purposes, has recently been described by Meirion-Jones (1976). The form seems to have persisted even longer in southern Essex, for a recently excavated circular hut at Mucking was dated to the 2nd-3rd century AD on the evidence of associated pottery (Jones 1974, 188).

Whilst the majority of the pottery used in this phase was still coarse ware in the Waltham style, fabric E fine wares were present. One of these vessels, the large jar 326, seems to be allied to Rodwell's group IIc of earliest Belgic' coarse wares, although it has a cordon below the rim (Rodwell 1976, 225-34, fig 16.21-6). Similar vessels have been found associated with Potin class ii coins at Kelvedon (Rodwell, K. A. pers comm); Allen has shown that Class ii

Potin coins are post-Caesarian (Allen 1971, 140-1). Rodwell (1976, 207) suggests that their manufacture ceased within a few decades of Caesar's expeditions. A date within but not necessarily late in the second half of the 1st century BC thus seems probable for this vessel. The two other vessels are highly unusual. The tall vessel 286 (Fig 73.1), with a thickened base, resembles a much smaller vessel found beneath Red Hill III at Langenhoe (Fig 73.2; Reader 1908, 28, fig 8B), although the latter has a less angular profile, and the base is not excessively thickened: it is handmade, in a coarse, lumpy, low-density, vesicular grey fabric containing flint fragments up to 2-3 mm in diameter, but no sand; the surfaces are burnished, with a slight vertical emphasis.⁶⁴

The second vessel, 301 (Fig 73.3) has stabbed decoration in zones, partly defined by burnished lines; the zones seem to be pendant triangles. A fragment of a vessel of similar form was found at Heybridge in 1972,⁶⁵ although not enough survives to suggest the scheme of decoration (Fig 73.4). It is in a hard, dark grey to black sandy fabric, containing grits up to 1.5 mm in diameter: the surfaces were once burnished. The impressions were formed with a blunt rod of circular cross-section. The three sites at which these vessels were found are closely related geographically: the River Chelmer, on which Little Waltham lies, flows into the River Blackwater just before the latter enters its estuary at Heybridge, whilst Langenhoe lies on the coast a little further to the north (Fig 72A). The late S Hazzeldine Warren's collection included 'a coarse sherd of brown ware, with a row of stabs below the lip which do not go right through' from Asheldham, in the Dengie peninsula, south of the Blackwater Estuary (Colchester Museum, mss). No insular parallels for the stabbed decoration have been traced. In her survey of stamped Iron Age pottery (1975), S M Elsdon illustrates nothing similar; the sherds from Mucking (fig 14) bear quite different patterns, and the dots are shallowly impressed with a round-ended tool producing impressions quite unlike those on the Heybridge and Waltham pots. Close parallels to the forms of 286 and 301 are equally elusive, although pots of the same general type as 286 are known from north Lincolnshire sites (eg Winterton, Old Winterringham, and Dragonby) in shell-tempered fabrics; there, however, they belong to the 1st century AD.⁶⁶ However, the vessels from Essex find close parallels in the middle Rhine area. For comparison, six vessels from the cemetery at Wederath-Belgium (Haffner 1971) are illustrated in Fig 73. The form and decoration of Waltham 301 (no 3) is closely paralleled by the smaller jars 6 and 7, whilst the Heybridge vessel (4) seems closer to 9. Another pattern of stabbed decoration is illustrated by no 8 although for our purposes the principal interest of this vessel lies in its form, close to Waltham 286 and closer to the vessel from Langenhoe (2); no 5 is also relevant, sharing with Waltham 286 (1) the rather wide rim and thickened base. The vessels with stabbed decoration belong to the La Tène D2 phase, whilst the beaker 5 is earlier, belonging to the La Tène D1 phase. The dating of these phases is discussed by Haffner (1974, 68-9): the beginning of D1 is seen to be securely dated to c 100 BC, whilst grave-finds of horizon 5 in the Trier area, equated with phase D2, appear to originate c 50-40 BC. These in turn are succeeded by the earliest Gallo-Roman horizon, including 'Belgic' wares, c 20-10 BC.⁶⁷

If the parallel is valid, a date within the period c 50-10 BC seems to be indicated for the Waltham vessels, no 286, at least, probably belonging rather early in that range. At Langenhoe, the association of the vessel 2 with a bowl bearing curvilinear decoration in the Canewdon-Langenhoe style (Reader 1908, fig 8A; Grimes 1953) and a

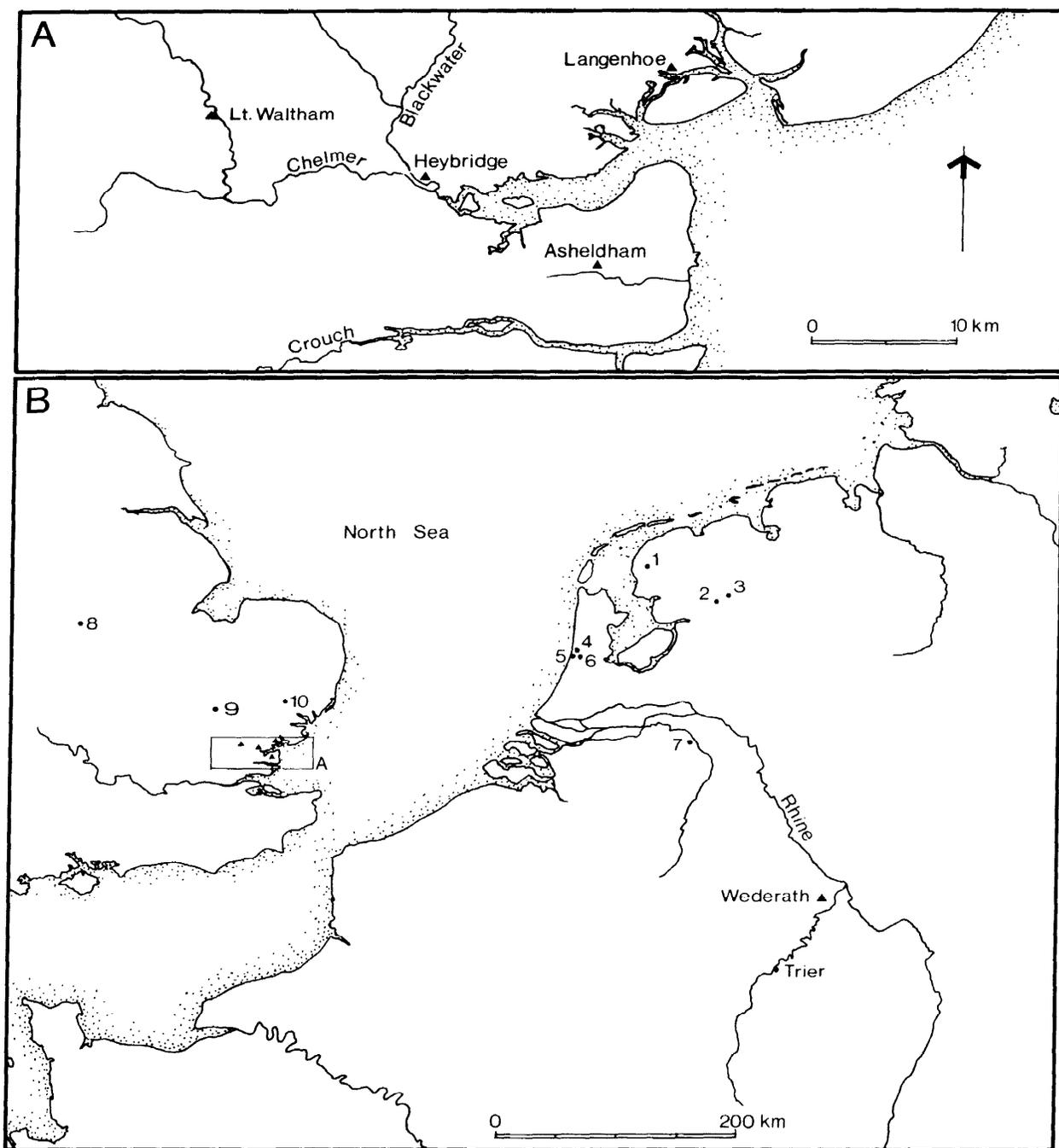


Fig 72 **A** Map showing the distribution of pottery with stabbed decoration, and related types, in eastern Essex; **B** North-western Europe, showing principal sites mentioned in the text; 1, Wommels; 2, Ruinen; 3, Wijster; 4, Velsen; 5, Waterworks of Amsterdam; 6, Spanjaardsberg; 7, Haps; 8, Breedon-on-the Hill; 9, Linton; 10, Darmsdell

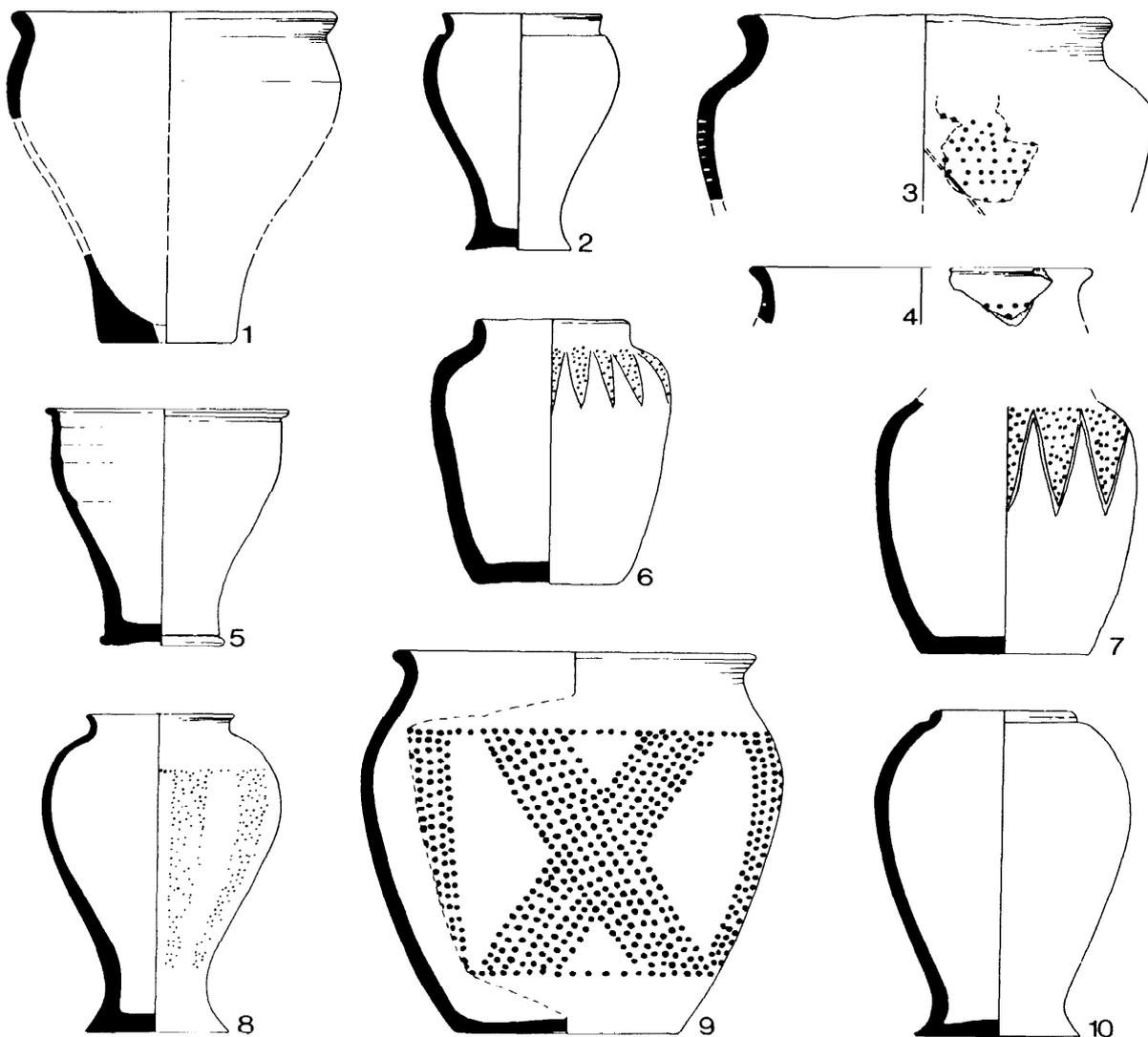


Fig 73 Pottery from eastern Essex and the Middle Rhineland: 1, Little Waltham 286; 2, Langenhoe, Essex (Colchester Museum); 3, Little Waltham 301; 4, Heybridge, Essex (Colchester Museum); 5-10 from the cemetery, at Wederath-Belgium, after Haffner 1971: 5, Gr. 118.12; 6, Gr. 235.3; 7, Gr. 95.8; 8, Gr. 56.14; 9, Gr. 245.12; 10, Trier area, after Haffner 1974, Fig 5.3

multiple cordoned bowl or jar (Reader 1908, fig 9.11) of Rodwell's earliest 'Belgic' type, group III d (Rodwell 1976, 234 and fig 17.34-9) seems to suggest that it is of relatively early date. However, a close parallel appears in material characteristic of the earliest Gallo-Roman horizon in the Trier area (Haffner 1974, Abb 5,3: illustrated here as Fig 73.10).

The Waltham, Heybridge, and Langenhoe vessels are in very different fabrics, and no direct comparisons have yet been made with the German material. Whether any or all of these vessels are imports, or whether we are simply dealing with stylistic similarity, is a problem remaining for future consideration. However, some connexion between the middle Rhineland and the area around the Blackwater

estuary at this period seems almost inescapable. The nature of the connexion, whether commercial or the result of small-scale folk-movement, perhaps in response to Roman activity in Gaul, is at present wholly within the realms of speculation.

Such dating evidence as exists for Period IV suggests a post-Caesarian date, whilst the absence of any quantity of 'Belgic wares and the nature of the occupation seems to militate against a lifespan of more than about a quarter of a century for at least that part of the Period IV settlement which has been excavated. In general terms, therefore, the Period should probably be assigned to the third quarter of the 1st century BC.

Little can be said of later pre-Roman settlement in the

area. The presence of 'Belgic' pottery points to occupation in the area of Little Waltham Lodge (above, p 44). and the burial (p 37) suggests that the site was of some importance around the time of the Roman conquest. Whether this settlement developed from the Period IV site, or independently later is a problem which can only be solved by further excavation. When the Period IV settlement was abandoned, the excavated site was given over to agriculture; the remains of the field system are of considerable interest and extent, and will be considered below (pp 134-6).

A casual discovery of great potential interest is the coin of Ptolemy VI (181-46 BC), which was found sufficiently close to the Iron Age settlements to suggest the possibility of its being a contemporary import. Although a large number of early Greek coins are known from Britain, only one of Ptolemy V from Winchester has yet been found stratified in an Iron Age level (Cunliffe 1964, 15); its authenticity is disputed by Collis (1975), whose objections are convincingly refuted in general terms by Biddle (1975). However, their distribution suggests that some, at least, are genuine ancient imports, either in the Iron Age or in the Roman period (Laing 1968, 17). The presence of this coin at Waltham accords with a noted concentration around the mouth of the Thames (*ibid*, fig 4; Harbison & Laing 1974, 26-7). In this connexion, it is perhaps worth mentioning the finding of a Greek coin of c 200 BC, from the island of Seriphus in the Aegean (obv: head of Perseus; rev: head of Gorgon, facing view), in 1962 at Downham, Essex (TQ 737 953) during fieldwalking of a possible hillfort site. Pottery dating from both the early and later pre-Roman Iron Age, as well as Roman material, was found at the same time.

Period V

It is clear that in the Roman period there was a concentration of activity around the road junction at Waltham, timber structures being known from sites 2, 5, and 9 (p 44-7, and Fig 32). The building on site 2, standing apparently isolated within agricultural enclosures, seems likely to have been a farm, and on present evidence site 9 was probably similar. However, the occupation represented by sites 5 and 6, around the junction itself, seems to have been more extensive, probably indicating the existence of a modest roadside settlement.

The area concerned, south and west of Little Waltham Lodge, is now parkland under permanent grass, and has only rarely been disturbed in recent years. However, in the mid 19th century it was split into four fields, the southern of the two central ones being called Wickham Ley, and the northern, Little Wickham Ley.⁶⁹ These two, if not all four, were probably once a single field. Gelling (1967) has suggested that names incorporating 'wickham' probably include the elements *-wic* (here a derivation from the latin '*vicus*') and *-ham*, and that the combination *wicham* was probably applied to certain Roman settlements early in the Anglo-Saxon period.

The position of the site, at a major road junction, is one which would seem favourable to the development of settlement, although its proximity to Chelmsford would have militated against the emergence of a 'small town' of the type well known in the Trinovantian area (Rodwell 1975). On present evidence it seems to have been no more than 7 ha in extent, small when compared with the 'small towns' of Braintree (Drury 1976, 124,7) or Chelmsford, with gross areas of c 20 ha or more.⁷⁰ The comparison may not be wholly valid, however, since we know little of the density of

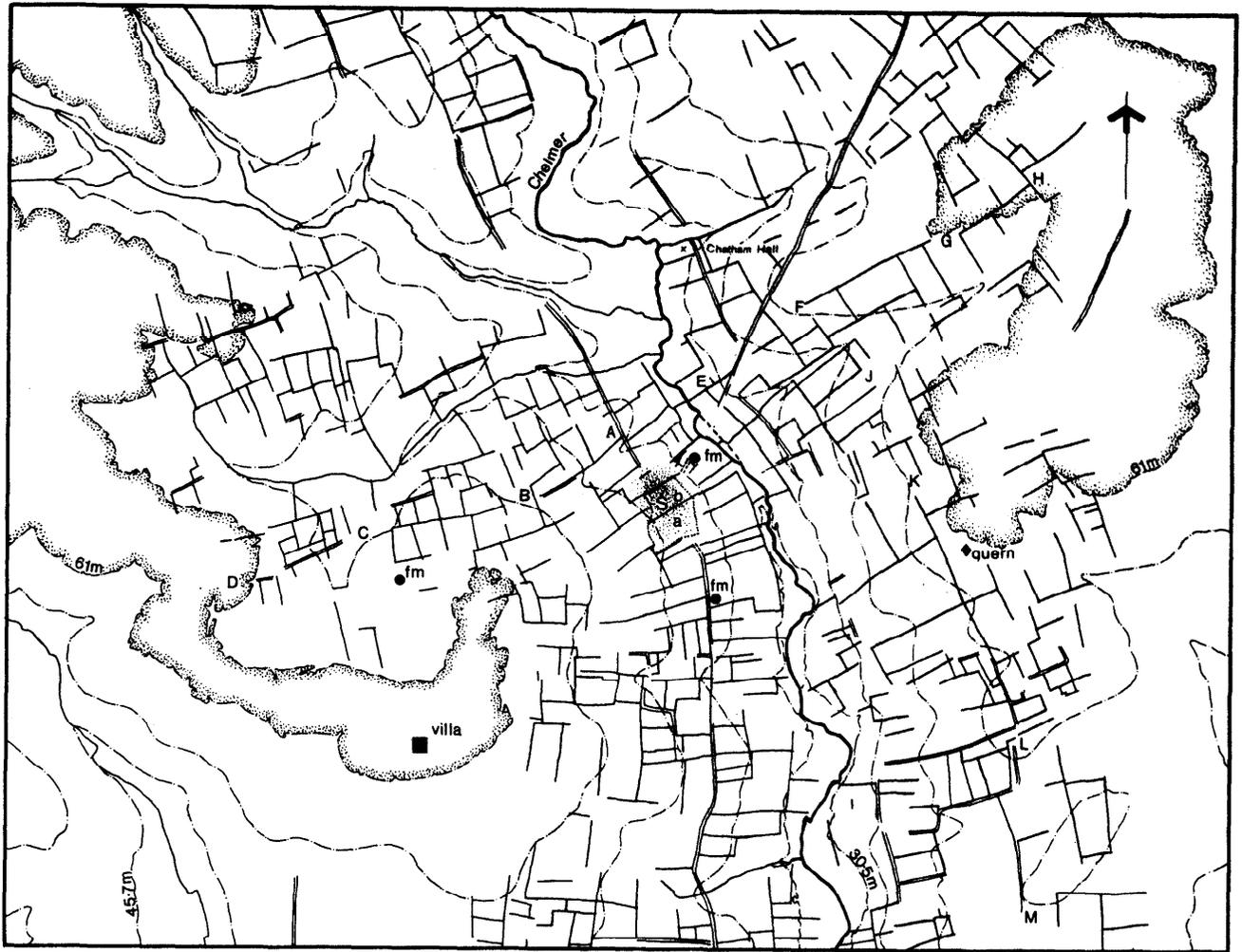
development within the settlements concerned. The cemetery at 4 presumably lay on the periphery of the site, and that at 7 some distance away by the river, perhaps for religious reasons.

The status, nature and functions of 'small towns' in the Roman period is as yet uncertain, but Rodwell has shown that in the ultimate Trinovantian area, the majority of *wicham* place-names are associated with such settlements, as one might expect. Yet some *wicham* sites, for example Little Waltham and Wickham Bishops, are too close to known 'small towns' (Chelmsford and Heybridge respectively: Rodwell 1975, fig 7) to have themselves developed into major market centres. Perhaps the answer is suggested by Johnson (1975, 79) who points out that by the 4th century 'we can be fairly certain that *vicus* had come to mean as much or as little as our own term "village".' We may have at Waltham a village, perhaps comprising two or three farms and the houses of their workers, together with a small number of artisans—but one large enough to suggest the use of appellation *wicham*, often seemingly, applied to 'small towns', to a Saxon observer in the 5th century. Such a model is compatible with an area in which there seem to be relatively few large villas, and where, as we shall see, an element of continuity of land allotment seems to have survived from the pre-Roman period.

The fact that ditch 252 in area A closely followed the alignment of the modern field boundary 254 suggested that other pre-medieval features, in addition to obvious lengths of road, might have survived as elements in the present landscape. To test this possibility, all lengths of boundaries or roads which were either approximately parallel to, or at right angles to, the Chelmsford-Dunmow and Waltham-Braintree roads were plotted against the natural features of the valley and the known Romano-British sites. Where the alignment of groups of field boundaries seemed to alter to suit the topography, these were included if they appeared to relate to the main series: the result is Fig 74.

West of the Chelmer, an extensive pattern of fields appears on the valley slope, extending westwards into a subsidiary valley. The rather meandering line of the main Chelmsford-Dunmow road, following the valley, emerges clearly; a subsidiary road ABCD is also apparent, with a gently curving course. It might be suggested that this continued east of the river, along the line EFGH, through a field system clearly related to that on the west side of the valley. The system on this side, south of this line, however, follows the alignment of this probable road or track, rather than that of the Chelmsford-Dunmow road on the opposite side of the valley. A north-south route on the east side of the valley might be suggested by the line JKLM, and there were doubtless other subsidiary routes between fields, and to the farms which largely remain to be discovered. One such site, clearly in existence by or before the 1st century BC, has recently been located⁷¹ to the south of point C on Fig 74.

The boundary ditches 252 and 259 (area A) clearly belong to this system, and it has already been shown that 259 went out of use in the Claudio-Neronian period. This in itself suggests an early date for the system, but the crucial evidence is provided by the Waltham-Braintree road, which appears to be superimposed on the field system much as a railway appears on a recent map to be superimposed on the earlier 19th century pattern of fields. The relationship is particularly clear between E and F (the area of the present village), where the road cuts through three distinct enclosures. It is inconceivable that these enclosures could have been laid out over a road that has continued in use until the present day. The road was clearly driven through an established landscape, if not in the wake of the conquest,



0 2 Km ——— Roads c. 1840 Fm Romano-British Farm S Principal Settlement
 ——— Field Boundaries c. 1840 a,b Wickham Ley, Little Wickham Ley

Fig 74 Little Waltham: the field system in the Chelmer Valley

then certainly early in the Roman period. The field system is therefore not Romano-British but late pre-Roman Iron Age: in Bradley's terminology, it is a cohesive system. The difference between true Roman roads, and earlier roads or tracks which continued in use, is clearly demonstrated by comparing the Chelmsford-Dunmow road with the Waltham-Braintree road; there must be many other examples of major roads of pre-Roman origin in the county.

With the exception of the small roadside enclosures excavated in area B, the only feature in the landscape which follows the alignment of the Waltham-Braintree road is a 1 km length of lane some 1400 m—approximately 1 Roman mile—to the east, on relatively high ground. The suggestion by Haverfield (1916, xxv) that the Waltham-Braintree road formed one side of a centuriation grid, based largely on its being parallel to the High Roding-Dunmow road, seven Roman miles to the west, might be reinforced by this section of lane. It is clear, however, that if such a system was laid out, in Waltham at least, only the axial roads were imposed on areas with a pre-existing field system, this latter continuing in use more or less unaltered. There is no evidence, either from site 5 or the topography, for an extension of the Braintree-Waltham road to the

south-west, as suggested by Brinson,⁷² though it remains possible that such an extension was created, but disappeared fairly rapidly. The development of the Braintree road within site A demonstrates clearly that, even in the countryside, Roman roads need not follow a static course for three-and-a-half centuries.

The survival of the field system shown on Fig 74, which clearly extends further along the valley to the north and south, would seem to depend upon the area concerned having remained in agricultural use (pasture or arable) without substantial interruption, from the late pre-Roman Iron Age to the present day. Not all of the boundaries shown are, of course, likely to be of Belgic origin—fields are subdivided, amalgamated, divided again, perpetuating the alignment, but not, in many cases, the original hedge lines. Where only a few lines have survived on the periphery of the area, for example in the north-west corner of the map, it seems probable that there was a break in cultivation, but not for so long that some old boundaries did not survive, possibly alongside tracks or paths. On the edge of one such area is Chatham Hall, whose name derives from a hybrid: a combination of the British *cet* with *hām(m)*. Except for certain river names, and places whose names are derived

from them, this is the sole instance of the survival of a Celtic element in an Essex place-name (Reaney 1935, 271, and xxvii); Dovercourt (*ibid.*, 337) surely falls into the category of names derived from rivers or streams. Chathamhall Spring and Chatham Green, to the north-east, are presumably derived from Chatham Hall.

The area in continuous agricultural use is generally confined, not surprisingly, to the favourable slopes of the Chelmer Valley and its subsidiary valleys. This seems to point to the higher ground, above the 61 m (200 ft) contour, being scrub and woodland, used no doubt for swine and as a source of timber. It is on the edge of this land, marginal in difficult periods, that the only known villa in the immediate vicinity is sited,⁷⁵ in an area which was presumably the most suitable one available for the expansion of agriculture in the Roman period. The fact that no recognizable traces of the villa field system have survived in the landscape seems to indicate that cultivation of the estate lapsed at the end of the Roman period, to be resumed only in late or post-medieval times. The same is probably true of many blank areas of the map—could the section of lane parallel to the Waltham-Braintree road be a Roman estate boundary?

The early burial alongside the Waltham-Braintree road is essentially native in character, and doubtless represents a person of some standing locally. The absence of samian vessels, despite the clearly post-conquest date of the interment, seems to indicate a conservatism not found higher up the social scale; the much richer graves at Stanfordbury (Beds), dated *c.* AD 35-50, both contained samian vessels (Stead 1967, 47). Its absence is all the more surprising in view of the presence of Claudio-Neronian samian on the site (p 93 above). There can be little doubt, in view of the location of the burial, the pottery from site 5, and the position of the latter at the centre of the field system, that the principal late pre-Roman Iron Age settlement was on the site of its Romano-British successor. Indeed, it is possible that the villa to the south-west is the result of the Romanization of the principal native family of the same area.

The development of the Romano-British farm found under the tennis court at 'The Limes' (site 2), to which most of the features excavated in area B must belong, is unremarkable, save for the fact that domestic occupation ceased at the close of the 3rd century. However, since there is some evidence that the field boundaries continued in use (p 40 above), it seems probable that two farms were amalgamated and the 'Tennis Court' house abandoned, for there can be no doubt that the settlement adjacent to Little Waltham Lodge (sites 5 and 6) continued into, and beyond, the 4th century. It is not impossible that the changes were connected with the period of Carausius; Richard Reece (p 94 above) has suggested a scattered hoard of the late 3rd century derived from the house at site 2, and the Sheepcotes Farm hoard (p 47 above) dates from the same period. However, an alternative explanation, in terms of currency reform rendering the bad coinage of this period worthless, has recently been put forward by Mattingly (quoted by Robertson (1974, 33) who provides (32, fig 5) a distribution map of hoards of this period).

Plant remains from the well, F339, confirm and to some extent amplify the picture of the local environment that emerges from other evidence. It was located in a field (perhaps pasture for horses), probably not too distant from dwellings (presumably site 2); there were wetlands at no great distance, along the Chelmer, but no major area of woodland or scrub existed in the immediate vicinity. The amount of animal bone recovered from Period V features is too small to enable any conclusions to be drawn about the economy of the settlement, especially in view of the lack of

comparable published material from the area. However, the horse remains seem to belong to relatively young individuals (where age could be assessed), whereas horse remains from a site within the small town at Braintree were over 20 years old, and were interpreted as draught animals (Luff 1976, 60). Finally the presence of crab (or possibly lobster) fragments in the well-filling (p 118 above) is worthy of note on a site rather distant from the coast.

Period VI

The church and the present village of Little Waltham lie on the east side of the River Chelmer, about 500m from one another. It seems likely that medieval and earlier settlement was largely concentrated around one or both of these nuclei: Chatham Hall, whose hybrid name (see above) must belong early in the Saxon period, lies somewhat to the north. Saxo-Norman pottery has been found in features exposed in a gravel pit to the south-west of the church,⁷⁴ but this is the limit of direct archaeological evidence for the Saxon period. It has recently been suggested that the place-name *Wealdham* (Waltham) was applied to royal estates established before the middle of the 6th century (Huggins 1975, 201). If the suggestion is correct, the estate doubtless included the present parishes of both Great and Little Waltham and possibly other adjacent areas. Indeed, the suggestion is strengthened by the discovery *c.* 1888 of a Saxon 'princely' burial of the early 7th century AD in Broomfield parish, on the west side of the Chelmer valley a little to the south of the present boundary of Little Waltham parish (VCH Essex 1, 320-6; Dickinson 1974, *passim*). Further, the existence of *wicham* within a *wealdham* is most interesting, especially when coupled with the evidence for continuity of agriculture in the Chelmer valley. The post-Roman archaeology of the Walthams deserves attention in the future; recent results elsewhere in Essex suggest that the churches could provide a useful starting point (Drury & Rodwell 1978).

In the later 12th century a small croft was established at Ash Tree Corner, on land which was until then probably under cultivation, since it was crossed by a post-Roman but pre-croft ditch, and fell within the area where the late pre-Roman Iron Age field system survived. The principal feature within the fenced enclosure was a posthole building of three bays, apparently linked to a further structure to the west, the latter mostly having been destroyed by the modern road. The building stood long enough to need repair, but was not subsequently replaced. Such structures seem to be typical of village sites in the 12th century (Hurst 1971), this example presenting a less difficult problem of interpretation than most. By the beginning of the 13th century the site had probably reverted to agriculture, remaining under cultivation, with some interruptions caused by gravel digging, etc, until the beginning of the excavation.

Conclusions

The preceding discussion of the cultural affinities of the Iron Age settlements at Waltham must be regarded as provisional in view of our lack of knowledge of settlements of this period in Essex, and indeed East Anglia as a whole, with the notable exception of *Camulodunum* (Hawkes & Hull 1947). The publication of other recently excavated sites, for example Mucking and Kelvedon, should enable us to extend the sequence established at Waltham to cover much, if not all of the pre-Roman Iron Age, assuming that

cultural traits are consistent within the area concerned, a point at present far from certain. Only when such a framework has been established will it be possible to assess fully the mass of chance finds, mostly from gravel pits, which survive in our museums.

Indeed the majority of known Iron Age sites in Essex, especially pre-Belgic ones, are on gravel, having been discovered either by aerial photography or during gravel extraction. However, the majority of the county lies on brickearth or clay, and Waltham clearly demonstrates that such areas were not devoid of settlement. The problem seems to lie in the identification of sites, for not only is aerial photography of more limited use on such soils, but Iron Age pottery rarely survives as a scatter on the surface of a ploughed field. Yet experience suggests that Iron Age, and indeed earlier prehistoric, sites are often found in close proximity to Roman settlements, particularly where these are on geographically favourable sites in river valleys. Roman sites are much easier to discern from surface evidence, and are more likely to have been recorded in the past, owing to the nature of the material associated with them. It thus seems worthwhile to undertake trial excavations in and adjacent to threatened Roman sites in likely areas, as was done at Waltham, in the hope of locating their possibly more significant predecessors. Waltham belies the suggestion that the clay and brickearth areas were without significant occupation in the earlier Iron Age.

Some attempt has been made to explore the continental affinities of the Iron Age pottery, but the significance of the parallels drawn can only be assessed when much more work has been done in this field.⁵ The existence of such affinities is perhaps not surprising, however, for during the post-Roman period, indeed down to the present day, first migration and latterly trade between the coastal area of north-west Europe (and the areas linked to it by the Rhine) and south-east England has been considerable, and there is ample evidence of contact between these areas in previous periods, for example earlier in the Iron Age (Cunliffe 1968, 178) and in the early Bronze Age (Clarke, D L. 1970).

Although a thorough study of the evolution of the landscape of the Waltham area has not been possible within the scope of this report, it is hoped that sufficient has been done to demonstrate the value of such studies, especially when they are centred on an area intensively examined by excavation. The extent to which Roman and pre-Roman elements survive and profoundly influence the present landscape of certain parts of Essex is now becoming clear: a study of the Braintree area has recently appeared (Drury *et al* 1976), and work is in progress on the Rivenhall/Kelvedon area (by W J and K A Rodwell) and in the Dengie peninsula (Drury & Rodwell 1978).

Acknowledgements

I must express my thanks, firstly, to the site staff—S R Bassett, who acted as assistant director in 1971, Messrs S Loscoe-Bradley, Paul Sewter, and Miss J Walker, who acted as site supervisors, and Miss J Secker, who acted as finds assistant; and also Misses R Jefferies, J F Macaulay, and I Thompson who undertook much of the post-excavation work on the Iron Age pottery. Thanks are also due to the Department of the Environment, Essex County Council, Chelmsford Rural District Council, and Mr G A Parker who jointly met the excavation costs, and to Mr Parker further, Dr M A Bazett, Mr J J Tufnell, Hugh Doe Ltd, and Shell Mex and BP Ltd, for consent to excavate. The cooperation shown by the contractors, Messrs Gabriel Construction, during the course of the work, especially their

forbearance in the early stages of the contract, was much appreciated.

I should also like to thank the following: Dr W J Rodwell, who has offered much helpful comment and criticism, in addition to reporting on the samian ware; F W Anderson, R H Allen, J Bayley, L Biek, J Evans, J G Evans, A Gebbels, E Healey, C A Keepax, D P S Peacock, S M Peglar, R Reece, V Rigby, C Saunders, J H Thornton, R F Tylecote, D F Williams, and D G Wilson, who have supplied specialist reports or notes; the staff of the Ancient Monuments Laboratory, who undertook conservation of wood and leather from the well, and work on the iron objects; Ann Rotherham for Figs 59-60, 62-4; F G H Gardiner and Peter Bailey, of the Inspectorate of Ancient Monuments Archaeological Drawing Office, for Fig 61 and Figs 3, 5-10, 13, 15, 17-22, 24, 26-8, 30-2, 34-5 and parts of Figs 54-5 respectively; Luigi Thompson for Fig 73; Ray Ferguson for Plate XI; Brian Peacock for Plate XII; Nick Bradford for Plate XVI; H G Midgley for Plates XIV, XV, and XVII; and Mr E A Clack (Southend Air Photography Ltd), who took aerial photographs of the site during the excavation.

I am also grateful to Dr Alfred Haffner, of the Rheinisches Landesmuseum, Trier, Dr J F von Regteren Altena of ROB, T C Champion, V Rigby, and Warwick and Kirsty Rodwell for their comments on aspects of the Iron Age pottery; responsibility for the conclusions drawn, however, rests with the author.

Finally, mention must be made of the encouragement provided by the then Chairman of Chelmsford Excavation Committee, the late Major J G S Brinson, FSA, and the generous assistance and hospitality of Dr and Mrs M A Bazett.

Notes

I Introduction

- 1 At the time of writing (June 1978) development has not begun.

II The site

- 2 The sites are either known to the writer as a result of recent fieldwork and excavation, or are plotted from entries in the first draft of M R Hull's gazetteer for *V C H Essex* 3, which included pre-Roman as well as Roman sites. A copy is held in Colchester and Essex Museum.
- 3 Publication in *Essex Archaeol Hist* is envisaged in the near future. Bull 1937; Dunning 1933 and 1934.
- 4 Allen & Sturdy, forthcoming, describes these soils in detail with sections on the agricultural characteristics of the soils. The accompanying map shows the distribution of the principal soil types. For names of soil series and classification of soils, see Avery 1973. This field had not, however, been ploughed for at least 20 years before excavation began, since it formed a paddock attached to 'Foxtons'. The remaining parts of area A, and area B, were arable fields.

IV The excavations

- 7 Identification by Dr F W Anderson.
- 8 None of which was capable of being lifted.
- 9 In the north-western sector of this trench two fragments of iron plate were found; but since a fragment of a recent field drain was found in the immediate vicinity, their antiquity must be regarded with suspicion. There were no indications of an intrusive feature; animal activity might be responsible for their introduction.
- 10 I am grateful to Dr W J Rodwell for this suggestion.
- 11 What was presumably derived material also occurs in features 257, 259, and 263 in the region of C18.
- 12 It is possible that the resolution into a hollow was deliberate, to form a 'working hollow'.
- 13 This posthole was excavated in error with the adjoining section of feature 263: no details of its filling were therefore noted.
- 14 The Chelmsford-Little Waltham-Braintree road is described as route 11 in *VCH Essex*- 3, 29.
- 15 Bazett & Chapman 1966. The finds are in Chelmsford Museum. Some of the coins were wrongly identified in the original report (p 52), causing the excavators to suggest that intensive occupation

continued well into the 4th century. Most of the pottery need not be later than c 300. For a discussion of the flint-tempered pottery, see after no 347 in the pottery catalogue. The 'spear head' (p 53) was a knife, and the 'turf cutter' probably a leather worker's knife.

- 16 Reported in the *Archaeological Newsletter*. I. 11. 1. Mr B Flight of Waldens, The Street, and Mr J W Anstee provided additional details of the circumstances of the discovery, for which I am grateful.
- 17 By Dr and Mrs M A Bazett, in whose possession the material remains.
- 18 *Essex Natur.* 3, 144; the site is noted on the OS 6in map. I am grateful to Mrs M A Bazett for a transcript of the newspaper report.
- 19 Produced by Mr and Mrs J E Sellers, to whom my thanks are due for making it available. Much of the excavated material remains with Mr Flight (see n 16), to whom thanks are also due for making it available for inspection.
- 20 Barritt & Kettle 1962, 166; also correspondence in Chelmsford Museum.
- 21 Noted in *VCH Essex*. 3, 197. with reference to *J Roman Stud.* 19, 199 for the 1929 discoveries, but not otherwise published. I am grateful to Mrs S Brinson for making available the records of the 1948 excavations, following the death of Major Brinson in November 1973. The site is wrongly located on the OS 1:2500 plan.
- 22 Now with the author.
- 23 Barritt & Kettle 1962, 166 (where the house is called 'The Limes'). I am grateful to Mr B Goodey, one of the team of excavators, for a copy of the typescript report (with photographs) prepared by the school's Historical Association.
- 24 Information from Mrs R Bazett, who noted the discovery.
- 25 Identification no 643.
- 26 For the 1901 hoard, see *Trans Essex Archaeol Soc.* new ser 8, 229: *The Antiquary* 37, 99, 342.
- 27 The material was found in features exposed in the side of an old gravel pit at TL 712 124- *Trans Essex Archaeol Soc.* 3 ser, I, (1964). 214.

V The excavated material

- 28 For Linford, see Barton 1962. Preliminary information concerning the pottery from the adjoining site of Mucking has been supplied by Mrs M U Jones, to whom my thanks are due; but of course the fact that a form is not here noted as being present at Mucking does not mean that it is in fact absent from that site. I am also grateful to her for allowing me to illustrate vessel no 190 from Mucking.
- 29 Information from Mrs R Niblett.
- 30 *Colchester Museum Report.* 1956-62, 17.
- 31 In excavations by the writer, 1972-3. The type is discussed in Jones 1972, and occurs prolifically in Hertfordshire (inf from Miss V Rigby).
- 32 I am grateful to Dr W J Rodwell for this observation, and general advice on the Romano-British pottery.
- 33 The relative scarcity of flint-tempered sherds in the sludge, compared to the clay filling above, does not seem to have a chronological significance, for one would not expect a considerable period to elapse between the cessation of the deposit of material in the sludge and the deliberate filling of the well with clay. Perhaps flint tempered jars were not normally used for raising water.
- 34 *Roman Cokhestier.* f 500, there thought to be 3rd century: Kenyon 1935 (Verulamium Theatre) fig 11.28, there 4th century.
- 35 I am grateful to Dr W J Rodwell for this observation.
- 36 Down & Rule 1971-vessel D in grave 23, fig 5.20, with a TS platter of Trajanic-Hadrianic date.
- 37 Information from Mr S Weller of the Billericay Archaeological Society, who kindly drew the sherd to my attention. It was recovered in excavation during the construction of a new road, adjacent to the site noted in *Britannia*, 3 (1972), 331.
- 38 I am grateful to Mrs E Sellers and Mr S R Bassett for their comments on the medieval pottery.
- 39 But see also Green 1974, 84. Following his recommendation the micro-blade core 2 and at least some of the other blade cores would be of specialized form.
- 40 These figures do not include 21, which though technically a core-graver, does not appear to have been used as a core.
- 41 The totals are included with the flakes.
- 42 It has already been suggested that this classification is not particularly meaningful for Neolithic and Bronze Age scrapers (Green 1974, 86). Nevertheless it does provide, in short-hand form, some indication of the extent and position of the retouched scraping edge.
- 43 For a discussion of the weights from the Verulamium excavations, see Frere 1972, 160.
- 44 These specimens represent material which might possibly have been collected as 'ore', although even that is unlikely; any attempts at smelting would have been quite unproductive.

VI Discussion

- 45 In excavations at Chelmsford by the writer, and at Kelvedon by Mrs

Kirsty Rodwell; reports on the flints are in preparation, by Elizabeth Healey, and will be published with the excavation reports in due course.

- 46 Corrected on the basis proposed by Daman, Long, and Wallick. 3170 ± 130 bc is approximately equivalent to a calendar date of 3960 ± 130 BC.
- 47 The material came from lower and upper 'floors' separated by a layer of grey silt, within a 'pit dwelling' (Warren & Smith 1954, 27).
- 48 For Lawford excavations, see *Archaeol Excavations* 1971, 9; for Orsett, St Joseph 1973; Palmer 1976, 185, and fig 19.30. Trial excavations were undertaken by J D Hedges in 1976, for which see Hedges 1978.
- 49 At Saffron Walden, several sherds of Neolithic pottery, including a simple rolled-over rim, were found in excavations by S R Bassett on the Elm Grove site, situated on combe deposits; for publication, see Drury forthcoming.
- 50 Noted in the records of the Chelmsford Philosophical Society, now in Chelmsford Museum. The present location of the object is unknown.
- 51 Listed by Stanford (1970, 126-7).
- 52 Unpublished; information from W J Rodwell.
- 53 For a discussion of possible uses of these structures, see Ellison & Drewett 1971.
- 54 It may be worth noting that the Ardleigh hut (Erith & Holbert 1970), an isolated example, also produced a few 'Belgic' vessel%.
- 55 I am grateful to R L Otlet for his assistance in assessing the implications of these dates.
- 56 In small quantity in excavations by S R Bassett, submitted to the author for report; for Saffron Walden, set Drury forthcoming.
- 57 Other sites in Leicestershire and adjacent areas which have produced smaller quantities of comparable material are described by Cottrill & Dunning, in Kenyon 1950, 43-68.
- 58 But the general comments in Spratling 1974 may be relevant here.
- 59 In excavations by the author (1972), currently being prepared for publication.
- 60 Information from the excavator, Ian Hodder; report forthcoming In *BAR* series.
- 61 Information in correspondence from J F von Regteren Altena. (ROB) to whom I am grateful for assistance and comment.
- 62 I am grateful to T C Champion for drawing my attention to this site.
- 63 The following paragraphs have benefited greatly from discussions with Warwick Rodwell.
- 64 The vessel is now in Colchester Museum. I am grateful to the curator, D T-D Clarke, for allowing me to remove some of the plaster used in the restoration, thus making it possible to show in Fig 73 a more accurate sectional view than that given in the original publication. The lower part of the interior of the vessel is filled with plaster.
- 65 By the author, during the excavation of a multi-period gravel terrace site at TL 850 082. It was residual in a Romano-British pit, but there was evidence of occupation during most of the pre-Roman Iron Age. Report in preparation.
- 66 Unpublished material; information from Miss V Rigby.
- 67 I am grateful to Miss Rigby, who first drew my attention to the Wederath material, and to Dr Haffner for his assistance and comments (in correspondence) on the Waltham material.
- 68 The coin was found by Mr F Bond, and identified by G K Jenkins, Dept of Coins and Medals, British Museum; a copy of his letter to Mr Bond, dated 8.11.62, is in Chelmsford Museum. Other early coins from Essex include one of the mid 3rd-mid 1st centuries BC from Knossos (BM Cat 46) found at Radwinter (*Trans Essex Archaeol Soc.* 3 ser. 12 (1970). 339), a coin of Sidon from Bardfield (Great or Little; *VHU Essex* 3, 46), a Carthaginian coin from Colchester, a Ptolemaic coin from East Ham (Milne 1948, 37), and a silver coin of Ptolemy XI (81 BC) found on the beach at Southend in 1908 (Colchester Museum, 1697.08).
- 69 Tithe Map and award of Little Waltham in Essex Record Office, D/CT 380 A, B.
- 70 Detailed work on Braintree (Drury *et al* 1976) revealed that the settlement area was much larger than had previously been realised; similar detailed work may necessitate the reappraisal of the areas of other settlements summarized in Rodwell 1975, 87, and figs 2, 3.
- 71 By the late Mr H E Young, on the edge of gravel workings at TL 6910 1195, some 2km west of the Little Waltham site. Excavation is envisaged by Miss C Couchman of Essex County Council.
- 72 *VCH, Essex* 3, 29, n 30.
- 73 Evidenced by a considerable scatter of Roman pottery and building debris (tile, flint, freestone) at TL 693 111 (Kettle 1965).
- 74 See n 72 above, and p 44 above.
- 75 For an interesting beginning, see Champion 1975, especially his distribution map of triangular clay loom weights (fig 2, p 133) and discussion of other common features of Iron Age culture on either side of the English Channel and the North Sea (pp 132-4). It seems probable that each specific group of artefacts (in the broadest sense) which occur in both Britain and Europe will have a different distribution, suggesting complex patterns of contact and mutual tradition.

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APPENDIX I

Iron Age and Roman plant remains

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Introduction

Four samples have been examined from Little Waltham, three from an Iron Age round house destroyed by fire, probably in the late 3rd century BC, and one from the Roman well (dated *c* AD 300 by the excavator). Unfortunately the samples from the different periods are not easily compared. The Iron Age samples contained rather few fossils which were mostly carbonized, the Roman one an abundance of waterlogged plant remains. This paper is part of research project GR/3/1187 (1970-4) on the vegetational history of Iron Age and Roman Britain, financed by the Natural Environment Research Council; the results will be described and published in full detail elsewhere.

Samples from the Iron Age house C11

The three samples were all taken from the wall trench of the house. Samples 1 and 2 were close together and had been given the same excavation code; sample 3 came from a point 1.5 m distant. Sample 1 was examined first and found to contain disappointingly few plant remains. Samples 2 and 3 were then studied to obtain data in more significant numbers, and to check whether results from different parts of the house showed any variation.

Sample 1

This sample consisted of some 2 kg of slightly calcareous, wet, rather carbonaceous orange-brown clay, which would not disperse in water. Four sub-samples of 200g each were taken and processed separately with different chemicals. In this case a 7% solution of sodium hydroxide proved the quickest and most effective dispersal agent, although the other sub-samples eventually dispersed satisfactorily. Each sub-sample was then washed through a sieve, aperture 180 μ m. Plant remains were extracted from the residue with fine forceps or size 00 paint brush under a binocular microscope at $\times 25$. Identifications were made at higher magnifications and using a reference collection of modern fruits and seeds. The results of the four sub-samples are here considered together.

Seventy-nine fossils, of seventeen species, were identified. They are far too few to warrant any quantitative assessment of the crops grown, or of the importance of different elements of the natural vegetation of the area. Indeed, seventeen species can only represent a very small proportion of the local flora. It will give only a partial, and probably biased, glimpse of the plant life growing on or around the site in the Iron Age. (For comparison, the number of species in one category alone—ie weeds—recorded in the author's own garden, exceeds 90).

Twenty-seven cereal grains were found, all of them badly blistered and distorted, suggesting that they had been carbonized at high temperature, perhaps when fire destroyed the house. They are identified as oat (*Avena* sp.) and probably wheat (cf *Triticum* sp. or spp.). Six twisted awn fragments were also found, probably of *Avena*, and five glume bases of a species of *Triticum*.

Seeds of fruits of some fifteen species were identified in addition to the cereals. At least three of them are species that often grow on light or sandy soils. They are *Montia fontana* L. ssp. *chondrosperma* (Fenzl.) S M Walters [blinks], *Rumex angiocarpus* Murb. [sheep's sorrel], and *Stellaria graminea* L. [lesser stitchwort].

The presence of *Ranunculus parviflorus* L. ['small-flowered buttercup'] is of particular interest; it is now a local plant of dry grassy banks and pathsides, confined to the southern parts of Britain today and becoming increasingly uncommon (Clapham *et al* 1962; Perring & Walters 1962). It was at one time quite a common weed of arable land in south-west Britain, where the climate is sufficiently mild to enable the plants to survive the winter as rosettes (Salisbury 1921). Fossils of *R. parviflorus* have been found in interglacial deposits in Britain, but until now all post-glacial records have been from Roman deposits (Godwin 1956; Dickson, unpublished). If this earlier occurrence at Little Waltham represents a newly introduced species, one might suppose it came to Britain as an impurity in seed corn and was growing in the fields with the cereals. Alternatively, the absence of *R. parviflorus* from known pre-Roman deposits elsewhere may be merely fortuitous. If so, the species may have been established long enough to have spread to other habitats, and the Little Waltham specimen could have come from any grassy place.

Similar uncertainty applies to other species in the sample. Relatively few weeds of arable land are confined to cultivated fields. Many can grow equally well on wasteland or disturbed ground, and all the Little Waltham weeds can do so. They include *Chenopodium album* L. [fat hen], *Polygonum aviculare* agg. [knot-grass], *Polygonum convolvulus* L. [black bindweed], *Rumex* sp. [dock], *Stellaria media* (L.) Vill. [Chickweed], and *Tripleurospermum maritimum* (L.) Koch. ssp. *inodorum* (L.) Hyl. ex Vaarama [scentless mayweed]. All of these except the last are known to have been used as food in prehistoric times (Wilson 1974), but with a sample such as this, where the number of fossils is so small, we cannot suggest that they were here being deliberately cultivated or collected. Nor can we guess whether they were carbonized with the cereal grains, or merely became incorporated with them in the same deposit after carbonization.

Although most of the fossils in the sample were carbonized, a few plant remains survived in semi-waterlogged condition. This suggests that any mass of utilized plant products reaching the wall trench would have survived at least in part. Mr Drury had hoped that plant remains would provide some information about particular activities carried out in the house, or about the structure of it. Unfortunately the species found seem to give no information on these points. With particular regard to thatching, corn straw would certainly have been available in this and any other agricultural community, but no trace of burnt or unburnt straw was evident during treatment of the sample or during sorting. None of the species in the sample is used for thatching.

Sample 2

The second sample consisted of about a further 1 kg of carbonaceous clay taken close to sample 1, and bearing the same excavation code. It was lithologically similar to sample 1 except that its carbon content was slightly greater. The fossil content was very like that of sample 1, and the same general conclusions may be drawn from it. Seventy-two fossils, of sixteen species, were identified, and fourteen species are common to both samples. Sample 2 lacked *Ranunculus parviflorus* and *Stellaria graminea*, but contained two additional species of interest. There was one seed

of *Plantago lanceolata* L. [ribwort plantain], a species especially characteristic of neutral or basic soils (about pH 7-8.5) and often growing in pastures or other trampled places. It has been recommended as a fodder crop for poor land because it 'certainly yields an early succulent herbage', and it was at one time used medicinally (Morton 1871; Imbesi 1964). Two fruits of *Sherardia arvensis* L. [field madder] were also found. Although this species is nowadays a common weed of arable fields and waste places, its fruits have rarely been found fossil in Britain. The fruits may have been unrecognized in the fossil state because of drastic changes brought about by carbonization or in waterlogged conditions. Field madder, in common with most species of the family *Rubiaceae*, has roots which yield a reddish-purple dye, but the roots are slender and the larger roots of *Rubia peregrina* L. [wild madder] would have been used for preference where available. *R. peregrina*, however, has a limited and mainly south-westerly distribution in Britain, whereas *Sherardia arvensis* occurs throughout the British Isles (Perring & Walters 1962). True madder, *Rubia tinctorum* L., is not native in Britain. It was probably first introduced as a cultivated plant around the 7th century AD, at which time the first historical records appear in France (Forbes 1964). However, Pliny notes that 'almost all the provinces teem with it' but he does not specifically state that the plant was then in cultivation. (*Nat Hist* XIX, 47). As with the other species from the Iron Age house at Little Waltham, the very small number of *Sherardia* fossils precludes any judgement whether the plant was merely present as a weed or whether it had genuinely been collected for use. Many fruits of *Sherardia* have been found recently in Iron Age deposits at Abingdon, Oxon. but the species fruits so abundantly that even this may not be significant (Jones & Wilson, unpublished).

Sample 3

The third sample from the Iron Age hut was similar in content and implication to the two already described. It came from the wall trench some 1.5 m distant from samples 1 and 2. Work on the sample is not yet complete, but about 60 fossils of 19 species have been identified so far. Most of these species occurred also in samples 1 and 2. A single seed of *Centaurium* sp. [centaury] was found, but the testa was largely destroyed during carbonization and a species determination cannot be attempted. Plants of British species of *Centaurium* are often difficult to distinguish from each other, and the seeds are at least equally difficult: they are rather irregular in shape, up to approximately 0.4 mm in maximum diameter, and ornamented with a large raised reticulum. Their small size perhaps accounts for the scarcity of recorded fossils. Most species of *Centaurium* have restricted distributions in Britain, but they all grow in grassy places, often near the sea.

Sample from the Roman well F339, grey sludge, layer 10

Some 1.5 kg of this large sample was examined. It consisted of wet grey silty clay c pH 7 with occasional flint and limestone pebbles, potsherds, bones, shells, etc. It dispersed readily in water but was otherwise treated in the same way as the Iron Age samples described above. Over 3,000 fossils were identified from the sample; they belonged to some 103 taxa mostly at specific level.

Trees and shrubs are poorly represented. A single catkin scale of *Populus cf tremula* L. [aspen] was found, and several fruits of birch including *Betula pendula* Roth [silver

birch]. Both are easily dispersed by wind, the catkin scale being extremely thin, and the birch fruits having wings. Cone scales of birch were also found, and they too have a large surface area in relation to their weight. Both shrubs present, *Sambucus nigra* L. [elder] and *Rosa* sp. [wild rose], have fleshy edible fruits, and the seeds found in the well could indicate collection by man or dispersal by birds. There are many other common species of trees and shrubs with easily dispersed fruits, so it must surely be significant that so few were found in a deposit as rich as this. The evidence from the excavation indicates that the well was not sited in a walled or fenced yard, partly sheltered from the wind, but in an open field. Timbers found in the upper layers of the well-filling may represent part of the shaft lining, or perhaps some kind of roofing. A roof over the well might restrict the input of bird-dispersed seeds, but would scarcely affect the accumulation of wind-borne seeds. It seems reasonable therefore to infer that there was no major area of woodland or scrub in the immediate vicinity.

Birch fruits with narrow wings, and broad at the base, were also found in the sample. They are remarkably close in morphology to fruits of *Betula nana* L., the dwarf birch of the Scottish mountains. The world distribution of the species includes arctic and northern Europe, the Alps, Greenland, etc. Further work is needed to assess the significance of the Little Waltham fruits, but it seems most likely that they represent abnormal fruits of the tree-birch of more temperate climates.

Several species show that there were wetlands in the vicinity of the site. There was one fruit each of *Eleocharis palustris* (L.) Roem. and Schult. ssp. *palustris* [common spike rush], *Isotepis setacea* (L.) R. Br. [bristle scirpus], *Ranunculus flammula* L. [lesser spearwort], *Ranunculus lingua* L. [greater spearwort], *Scirpus tabernaemontani* C. C. Gmel. [glaucous bulrush], and *Typha latifolia* L. [reed-mace]. All these species grow in wet places such as marshes, ditches, or the edge of ponds and lakes, and especially in base-rich or non-acid conditions. Suitable habitats are likely to have been available for them beside the River Chelmer not very far away. Each fruiting head of *Typha latifolia* produces many thousands or perhaps even millions of tiny plumed seeds, readily dispersed by wind, and the other wetland species are also prolific. Finding only one example of each in the well sample suggests that no other suitable habitat existed nearer than the river.

A single fruit of *Eriophorum* sp. [cottongrass] was also found. This genus occurs in boggy or marshy places. The Little Waltham specimen is possibly the broad-leaved *Eriophorum latifolium* Hoppe, as the other species prefer acid conditions not otherwise proved by the species recorded. If so, this is of interest because the plant is now rare in southern Britain, and has been extinct in southern East Anglia since about 1930 (Perring & Walters 1962).

Some of the species found show clearly that there was grassland or pasture somewhere nearby and it was probably calcareous. Many flowers of clover were preserved in the well, some of them mature enough for the pods to be almost ripe, and identifiable as *Trifolium cf pratense* L. [red clover]. A single ripe seed of the same species was also found. Red clover is a common plant of grassy places, and var. *sativum* is nowadays cultivated for hay. Other grassland species in the list include *Leontodon autumnalis* L. [hawkbit], *Linum catharticum* L. [purging flax, fairy flax], *Luzula campestris* L. [sweep's brush] *Medicago lupulina* L. [black medick], and *Prunella vulgaris* L. [self-heal]. Many caryopses of Gramineae [grasses] were present, but they have not been identified beyond the family. Although species of Gramineae may be found in all kinds of plant community, some of the Little Waltham specimens are

likely to be those of grassland. Besides the reasonable probability that the field with the well would not be used for an arable crop, for reasons of access, the abundance of grassland species suggests that the well was actually in a pasture.

A great many nettle achenes ('seeds') were found in the well: 1, 419 of *Urtica dioica* L. [stinging nettle] and 48 of *U. urens* L. [small nettle]. Both species are strongly associated with human settlements, where they are particularly characteristic of soils rich in nitrates, phosphates, etc; they are frequently found as fossils in archaeological deposits of this kind. In the case of Little Waltham, the nettles may have been growing in the meadow itself as well as around the dwellings, especially if there were grazing animals to enrich the soil with their droppings. It is even tempting to speculate that such a meadow might have been grazed by horses rather than sheep or cattle. We may note that 'horses, by their peculiar habit of dunging in one part of the field, produce a typical condition of the herbage (including) stinging nettles' (Bates 1955); these nettle patches are avoided when the animals are grazing. Cattle, on the other hand, defecate all over a field, and do not create localized patches of enriched soil. Where nettles do occur sporadically, cattle browse them quite readily and prevent their reaching maturity, Sheep nibble a closer turf than is indicated by the species found in the sample. *Urtica dioica*, however, has completely natural habitats such as fen woods which also provide suitable soils, and it has been found fossil in British Quaternary deposits of all ages (Greig-Smith 1948).

Urtica urens is less commonly found fossil. It occurred in Norfolk during the Cromerian Interglacial, before man reached the British Isles (Wilson, unpublished) and there is a record from the Palaeolithic site at Clacton (Reid & Chandler 1923). In the Post-Glacial period *U. urens* appears very late, and there is an appealing legend of its deliberate introduction by Mediterranean soldiers serving on Hadrian's Wall. The same story has been told of *U. dioica* (which would in fact have been readily available without importation): the nettle 'native to the Mediterranean region, was propagated by the Roman legions in their conquests all over Central Europe and into England. The Roman soldiers planted nettles, which are rich in formic acid, in every country where they found the climate cold. The soldiers, who could not stand the wet and chill of these regions, used to rub their limbs with the stinging nettles to warm their blood' (Lehner, E & J L, 1962). Quite apart from the fact that the troops serving in cold climates wore breeches (Richmond 1935, 8; Webster 1969, 123, 151) and could restore their circulation in heated bath-houses, we have to observe, alas, that *U. urens* has been found in Britain in pre-Roman deposits as well as *U. dioica* (Godwin 1956). Even though nettles would not have had to be imported, their medical use is not wholly impossible. The *Satyricon* of Petronius, written in the 1st century AD, describes a man's potency being restored after he had been anointed with ground pepper, ground nettle seed, and oil, and had been beaten with nettles (*Satyricon*, 138), while Pliny records a similar but less complex use of nettles in veterinary medicine (*Nat Hist*, XXII, 31-6). In the 19th century AD, arthritic or paralytic patients were treated by floggings with nettles (Lindley 1849). At a more mundane level, the plant has been used as an astringent, against jaundice, for internal and external bleeding, and to ease coughs and lung congestion (Miller 1722; cf Pliny, loc cit). The juice, roots, and seeds of the plant are all used: both *U. dioica* and *U. urens* still appear in modern pharmacopoeias in Europe (Imbesi 1964).

It is noticeable that Roman deposits, including civilian

sites, tend to yield more nettle achenes than other archaeological deposits. The prosaic explanation is probably that nettles grew freely on habitation sites of all dates, but that Roman sites are more likely than earlier ones to have provided suitable places for the achenes to be preserved. Nettles may be eaten as a vegetable, but not when they are old enough to bear ripe fruit. They are not likely to contaminate seed corn or food supplies, and therefore are unlikely to be found often or abundantly in places where carbonization is probable. Many British sites yield only carbonized plant remains, and nettles will therefore tend to be under-represented in the fossil record. Only on Roman or later sites is there a strong probability of finding wells, or deep ditches cut in poorly drained soil, where plant remains will be preserved by waterlogging. Samples from such deposits will inevitably yield a wider range of species than places such as hearths and drying-ovens where cleaned grain and selected foodstuffs will occur.

Indeed, several other supposed 'Roman introductions' have been found in Iron Age contexts in Britain, by deliberately seeking out suitable waterlogged deposits of that date. They include a number of species of minor economic importance which would not have been dried or used in bulk, and a number of weeds which would mostly have been removed from cereal crops during harvesting processes. One of them, *Ranunculus parvijlorus*, was in Iron Age sample 1 from Little Waltham itself (see above). Species from other Iron Age sites, but not from the disappointingly short lists from Little Waltham, include *Anagallis arvensis* L. [scarlet pimpernel], *Agrostemma githago* L. [corn cockle], *Hyoscyamus niger* L. [henbane], *Lithospermum, arvense* L. [corn gromwell], and *Prunus domestica* L. [cultivated plum] (Wilson, unpublished). Of these, scarlet pimpernel and henbane did, however, occur in the Roman well at Little Waltham.

Several of the weeds of arable and waste land found in the well are species regularly found in Roman deposits but not yet identified from earlier ones. They include *Aegopodium podagraria* L. [goutweed], *Chrysanthemum leucanthemum* L. [ox-eye daisy, marguerite], *Malva sylvestris* L. [common mallow], *Papaver argemone* L. ['long prickly-headed poppy'], and *Torilis japonica* (Houtt) DC ['upright hedge parsley']. All the edible weeds found in the Iron Age sample occurred also in the well, but in greater numbers. For instance, 110 nutlets of *Polygonum aviculare* were identified, and 240 nuts, perianth fragments or complete perianths of *Rumex* spp. These included *R. crispus* L. (curled dock) and *R. angiocarpus* Murb. [sheeps' sorrel].

One other fossil from the well deserves particular mention. It is a seed of the Cruciferae or cress family. The genus, *Sisymbrium* L., is not in doubt, but the species has not yet been determined; however, it is not a native British species and has not previously been found fossilized in Britain. It resembles *S. orientale* L. and *S. altissimum* L., both of which have established themselves in Britain relatively recently (Perring & Walters 1962), and both of which are native in regions including Eastern Europe and the Eastern Mediterranean (Clapham *et al* 1962; Salisbury 1961). There are, however, about 80 species of *Sisymbrium* in the temperate zones of the world, and more reference material is needed before the Little Waltham fossil can be assigned to a species.

Cambridge, November 1974

Acknowledgment

I should like to thank Mr Paul Drury for his cooperation and for helpful discussions about the site.

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APPENDIX II

The abandoned river channel

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Introduction

Rescue excavations at Little Waltham in 1971 revealed part of a buried channel running approximately NW-SE, slightly south-west of the modern River Chelmer. It was the first evidence for any earlier course of the river, which might have occupied any part of the floodplain (here up to 500m wide). Since the channel-filling itself yielded no datable artefacts, an attempt was made to determine its age by palaeobotanical means, because the buried channel could have been abandoned by the river long before the area was inhabited. Pollen analysis is not the most precise dating method for the post-glacial period, but in this instance it would evidently date the channel more closely than archaeological methods. A series of samples would have permitted a closer estimate of the date and of the time taken to fill the channel. Even so, the pollen showed that the river had changed its course recently enough to have influenced the settlements excavated nearby, and a radiocarbon date was thus shown to be needed.

The abandoned channel

Detailed observations had been impossible because the feature was being bulldozed. The excavator reported that the channel was cut into sandy gravel, no fluvial sediments being seen at the very base of the channel filling. (In the circumstances they may easily have been overlooked). The section at the deepest point consisted of a basal 0.75m of silty, coarse organic detritus mud with freshwater mollusca. It contained flint and limestone fragments, mostly subrounded, and the silt fraction was *c* pH 7. This detritus mud was overlain by 1.5m of grey clay and sand. The channel was sealed by brown clay (1m) extending laterally towards the area of the excavated settlement and capped by topsoil (see Fig 35 in main report). The lithology indicates shallow, still water at the time the detritus mud was laid down, ie the channel was by this time already cut off from the river. The 'grey clay and sand' has not been seen by us. Its presence suggests a renewal of the connexion with the river, perhaps a flood bringing in argillaceous material, but the channel itself was still not carrying running water. The brown clay overlying both the channel and the surrounding area is possibly a weathered facies of the grey alluvial clay, but it does not concern us here. The sequence appears to be typical of flood-plain aggradation in lowland eastern England.

Palaeobotany

For the pollen analysis, about 2ml of uncontaminated sediment was taken from within the bulk sample of detritus mud. The sample was prepared and counted as described by West (1968, 360-4), using Erdtman's acetolysis and mounting in silicone oil. The results are presented in Table I. About 1.5kg of the detritus mud was examined for macroscopic plant remains, ie fragments and seeds above 0.2mm. The sample dispersed readily in water and was

prepared in the manner described above (Wilson, p 142). The species identified are listed in Table II, grouped according to their (approximate) modern ecological preferences.

TABLE I Pollen analysis from the river bed at Little Waltham
(Counts are expressed as percentages of total pollen excluding spores and aquatics)

TREES (154 grains)		HERBS (300 grains)	
Betula	1.8	Gramineae	35.6
Pinus	0.8	Cyperaceae	6.0
Ulmus	0.2	Compositae, Tubuliflorae	0.2
Quercus	2.4	Compositae, Liguliflorae	0.4
Tilia	2.8	Artemisia	0.4
Alnus	21.6	Caryophyllaceae	1.0
Fraxinus	0.4	Chenopodiaceae	1.0
Populus	0.2	Epilobium	0.4
Prunus	0.2	Hypericum	0.2
		Filipendula	0.2
SHRUBS (46 grains)		Labiatae undiff.	0.2
Corylus	7.6	Mentha-type	0.2
Salix	0.6	Mercurialis	0.2
Hedera helix	0.4	Papilionaceae	0.2
Sambucus nigra	0.6	Plantago lanceolata	4.2
		P. major/media	0.4
SPORES AND AQUATICS		Potentilla type	0.2
(33 grains)			
Polypodiaceae undiff	2.8	Ranunculus acris type	0.4
Polypodium	1.2	Rosaceae undiff.	0.4
Lycopodium	0.2	Rubus fruticosus-type	0.2
Pteridium	16.0	Rumex acetosa-type	0.4
Nymphaea	0.4	R. crispus-type	0.4
Sparganium type	0.2	Umbelliferae	0.4
Potamogeton type	0.2	Urtica	0.2
		Solanum dulcamara	0.2

Discussion

The pollen spectrum from the detritus mud indicates a date after the development of mixed-oak forest in Britain. The virtual absence of elm pollen (one grain only) suggests, further, that the deposit was laid down significantly later than the pollen zone VIIa/VIIb boundary. This boundary is marked by a rapid decrease in the percentages of elm pollen. It is dated within a century or two of 3000 BC; it more or less coincides with the introduction of Neolithic agriculture and marks the beginning of forest clearance (Godwin 1956). Pollen spectra of this age and later show an ever-increasing proportion of non-tree pollen. The exact amount, however, varies from place to place according to the extent of local forest clearance. A pollen spectrum represents the pollen catchment from the region at the time of deposition; it will also show purely local factors. In the case of Little Waltham, comparison of the pollen and macrofossil date shows that much of the non-tree pollen was of local origin. No pollen grains could be identified as cereals, but the high values for grass pollen (Gramineae), ribwort (*Plantago lanceolata*), and other grassland or weedy species are typical of pollen spectra post-dating the introduction of agriculture. Turner (1970) describes the various kinds of post-Neolithic disturbance of the vegetation which can be detected in pollen diagrams. The Little Waltham spectrum compares more closely with Turner's 'pastoral' phases than with settled cereal-based economies of the Iron Age or late Bronze Age, but a series of pollen spectra would be needed to give the comparison any weight.

It is difficult to suggest an upper age limit for the Little Waltham pollen spectrum. Zone VIII in southern Britain, which begins around 550BC, is marked by an increase in the pollen of *Fagus* (beech) and *Carpinus* (hornbeam) both

TABLE II Plant macrofossils from Little Waltham river bed

(The species are arranged in groups according to their probable habitat at Little Waltham. Nomenclature follows Clapham *et al* (1962). New records are marked *. †. or ‡ for explanation. see postscript).

1 Woods, spinneys or hedges <i>Alnus glutinosa</i> (L.) Gaertn. alder; fruits, cone scales, wood <i>Betula pendula</i> Roth or <i>B. pubescens</i> Ehrh. birch; fruits, cone scales, catkins <i>Corylus avellana</i> L. hazel; nuts, wood <i>Crataegus monogyna</i> Jacq. hawthorn; fruits, thorns <i>Moehringia trinervia</i> (L.) Clairv. three-nerved sandwort; seeds <i>Prunus domestica</i> ssp. <i>insititia</i> (L.) C. K. Schneid. plum, bullace; fruitstone frags <i>Purnus spinosa</i> L. blackthorn; fruitstone, thorn cf <i>Quercus</i> sp. oak; acorn fragment <i>Quocus</i> sp. oak; wood <i>Rubus fruticosus</i> agg. blackberry; achenes <i>Salix</i> sp. or spp. willow; budscales <i>Sambucus nigra</i> L. elder; seeds † <i>Tamus communis</i> L. black bryony; seeds <i>Tilia</i> cf <i>cordata</i> Mill. lime, linden; immature fruit	<i>P. cf berchtoldii</i> Fieb. pondweed; fruitstones <i>Ranunculus sceleratus</i> L. arrow-head; fruits cf <i>Sagittaria sagittifolia</i> L. arrow-head; fruits <i>Scrophularia</i> sp. figwort; seeds <i>Sparganium erectum</i> L. var. <i>erectum</i> bur-reed; fruits <i>Typha</i> sp. reed-mace; fruits
2 Grassy places * <i>Aphanes microcarpa</i> (Boiss. & Reut.) Rothm. parsley piert; achenes * <i>Carex dioica</i> L. dioecious sedge; nuts in utricles <i>Carex</i> cf. <i>spicata</i> Huds. spiked sedge; nuts in utricles <i>Hypericum</i> cf <i>perforatum</i> L. St John's wort; seeds <i>Medicago lupulina</i> L. black medick; pods <i>Moehringia trinervia</i> (L.) Clairv. three-nerved sandwort; seeds <i>Plantago major</i> L. waybread, lambs tongue plantain; seeds * <i>Potentilla reptans</i> L. creeping cinquefoil; achenes ‡ <i>Prunella vulgaris</i> L. self-heal; nutlets <i>Ranunculus acris</i> L. meadow buttercup; achenes ‡ <i>Ranunculus bulbosus</i> L. bulbous buttercup; achenes <i>Ranunculus repens</i> L. creeping buttercup; achenes † <i>Stellaria neglecta</i> Weihe greater chickweed; seeds	4 Arable weeds and species of open habitats * <i>Aphanes microcarpa</i> (Boiss & Reut.) Rothm. parsley piert; achenes <i>Arenaria serpyllifolia</i> L. sandwort; seeds <i>Atriplex hastata</i> -type orache; seeds <i>Atriplex patula</i> L. orache; seeds † <i>Cardamine hirsuta</i> L. hairy bitter-cress; seeds † <i>Cerastium holosteoides</i> Fr, common mouse-ear chickweed; seeds <i>Chenopodium album</i> L. fat hen; seeds <i>C. album</i> var <i>reticulatum</i> fat hen; seeds <i>Galeopsis tetrahit</i> agg. hemp nettle; nuts * <i>Lapsana communis</i> L. nipplewort; cypselas <i>Plantago major</i> L. waybread, lamb's tongue plantain: seeds ‡ <i>Polygonum aviculare</i> L. s.l. knotgrass; nutlets <i>P. convolvulus</i> L. black bindweed; nutlets <i>P. lapathifolium</i> L. pale persicaria; nutlets <i>P. persicaria</i> L. redshank; nutlets * <i>Ranunculus parviflorus</i> L. small-flowered buttercup; achenes <i>Rumex cf acetosa</i> L. sorrel; nuts <i>Rumex crispus</i> L. curled dock; nuts in perianth † <i>Sisymbrium officinale</i> (L.) Scop. hedge mustard; seeds * <i>Sonchus asper</i> (L.) Hill spiny sow-thistle; cypselas * <i>S. oleraceus</i> L. sow-thistle; cypselas <i>Stellaria media</i> (L.) Vill. chickweed; seeds † <i>S. neglecta</i> Weihe greater chickweed; seeds <i>Urtica dioica</i> L. stinging nettle; achenes
3 Mud, marsh and aquatic habitats * <i>Alisma plantago-aquatica</i> L. water-plantain; fruits <i>Bidens</i> cf <i>cernua</i> L. nodding bur-marigold; cypselas * <i>Bidens tripartita</i> L. bur-marigold; cypselas <i>Callitriche</i> sp. a pondweed or star-wort; seeds * <i>Carex dioica</i> L. dioecious sedge; nuts with utricles † <i>Carex</i> cf <i>spicata</i> Huds. spiked sedge; nuts with utricles <i>Epilobium hirsutum</i> L./E. <i>parviflorum</i> Schreb. codlins-and-cream/ small-flowered hairy willow-herb; seeds <i>Hydrocotyle vulgaris</i> L. white-rot; mericarps <i>Lycopus europaeus</i> L. gipsy-wort; nutlets <i>Mentha</i> cf <i>aquatica</i> L. water mint; nutlets <i>Polygonum hydropiper</i> L. water pepper; nuts <i>Potamogeton</i> cf <i>filiformis</i> Pers. pondweed; fruitstones	5 Various habitats possible <i>Carex</i> sp. or spp. sedges; nuts <i>Cirsium</i> sp. or spp. thistles; cypselas <i>Compositae</i> daisy family; cypselas Cruciferae cress family; seeds Gramineae grasses; caryopses <i>Juncus</i> spp. rushes; seeds <i>Papilionaceae</i> clover family; flowers, pods † <i>Myosotis</i> sp. forget-me-not; seeds <i>Pteridium</i> -type bracken; sporangia <i>Rumex</i> spp. docks; nuts <i>R. acetosella</i> agg. sorrel; nuts <i>Viola</i> sp or spp. violet or pansy; seeds

of which are rather low pollen producers. Beech and horn-beam are absent from the Little Waltham spectrum, suggesting a date before zone VIII, but their presence in the area may simply be masked by the strong local clement in the pollen. Similarly, zone VIII is marked by an increase in pollen of blanket-bog species, not apparent in our sample, but local conditions may have been unsuitable. Pollen of various lesser species changes frequency from zone VIIb to zone VIII, but this can only be assessed in a sequence of several pollen spectra or by comparison with such a sequence from elsewhere in the vicinity.

The Little Waltham pollen spectrum therefore shows that the detritus mud was laid down significantly later than 3000 BC and probably before about 550 BC.

Plant macrofossils cannot be used for dating purposes with any confidence. They tend to be deposited nearer the parent source than pollen grains, and in less abundance, reflecting local conditions rather than regional trends in vegetational change. They can, however, be identified more precisely than most pollen grains, and the fossil record enables the history of many species to be traced with tolerable accuracy. Certain species in the Little Waltham list tend to indicate the later part of zone VIIb or the beginning of zone VIII. *Arenaria serpyllifolia*, *Medicago lupulina*, *Poly-*

gonum persicaria, and *P. convolvulus* are not yet recorded earlier than the Bronze Age in Britain, providing a possible lower limit for the detritus mud. Several species in the list are known from Iron Age deposits at Little Waltham and elsewhere in Britain, but have not yet been found earlier than the Iron Age. They include *Lapsana communis*, *Potentilla reptans*, *Ranunculus parviflorus*, and *Sonchus asper*. None of the undoubted Roman introductions is present, for example, fig, grape, mulberry, or coriander; but their absence may be fortuitous. It must be stressed that a natural deposit such as the abandoned channel is likely to produce macrofossils modifying the fossil record. Most pre-Iron Age (and indeed most Iron Age) records from archaeological sites in Britain are of carbonized plant remains, coming from corn-drying ovens and storage pits. Non-archaeological sites studied for purely ecological purposes are likely to yield a further range of species lacking cultivated plants and many of the synanthropic species. Waterlogged deposits closely associated with archaeological sites, such as the Little Waltham channel, tend to yield a much wider range of species than either (see Wilson, above, p 144). It will be of considerable interest to reconsider the macrofossil list from the channel in the light of the forthcoming radiocarbon date.

Acknowledgement

We should like to thank Miss K Guyton, formerly of this department, for identifying wood from the channel sample.

References

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Postscript

The radiocarbon date of 3360 ± 80 bp, received after this paper was prepared, lies within the age range deduced from pollen analysis. It indicates that the absence of *Fagus* and

Carpinus pollen is not an artefact due to the strong local element in the pollen spectrum.

The macrofossil list adds several species to the known Bronze Age flora of Britain. The new records fall into three categories, which cannot be discussed in detail here. The first includes species which until now have only been recorded from interglacial periods, or from the Iron Age or later. They are generally supposed to have been introduced to Britain by man, and are marked with an asterisk in Table II. The second group adds to a number of open-ground species, present in the Full-Glacial or Late-Glacial periods, which reappear in the fossil record after the forest maximum. They probably persisted in small numbers throughout the Post-Glacial, but were able to expand into new habitats provided by forest clearance. They are marked ‡ in Table II. The last category (†, in Table II) consists of species completely new to the British fossil record. It serves as a reminder that the fossil record is far from complete, and that the first two categories may be further modified or merged by further work.



1 Little Waltham: general view of the site from the north-west



II Little Waltham: general view of the site from the west, showing its relationship to the River Chelmer and the modern village



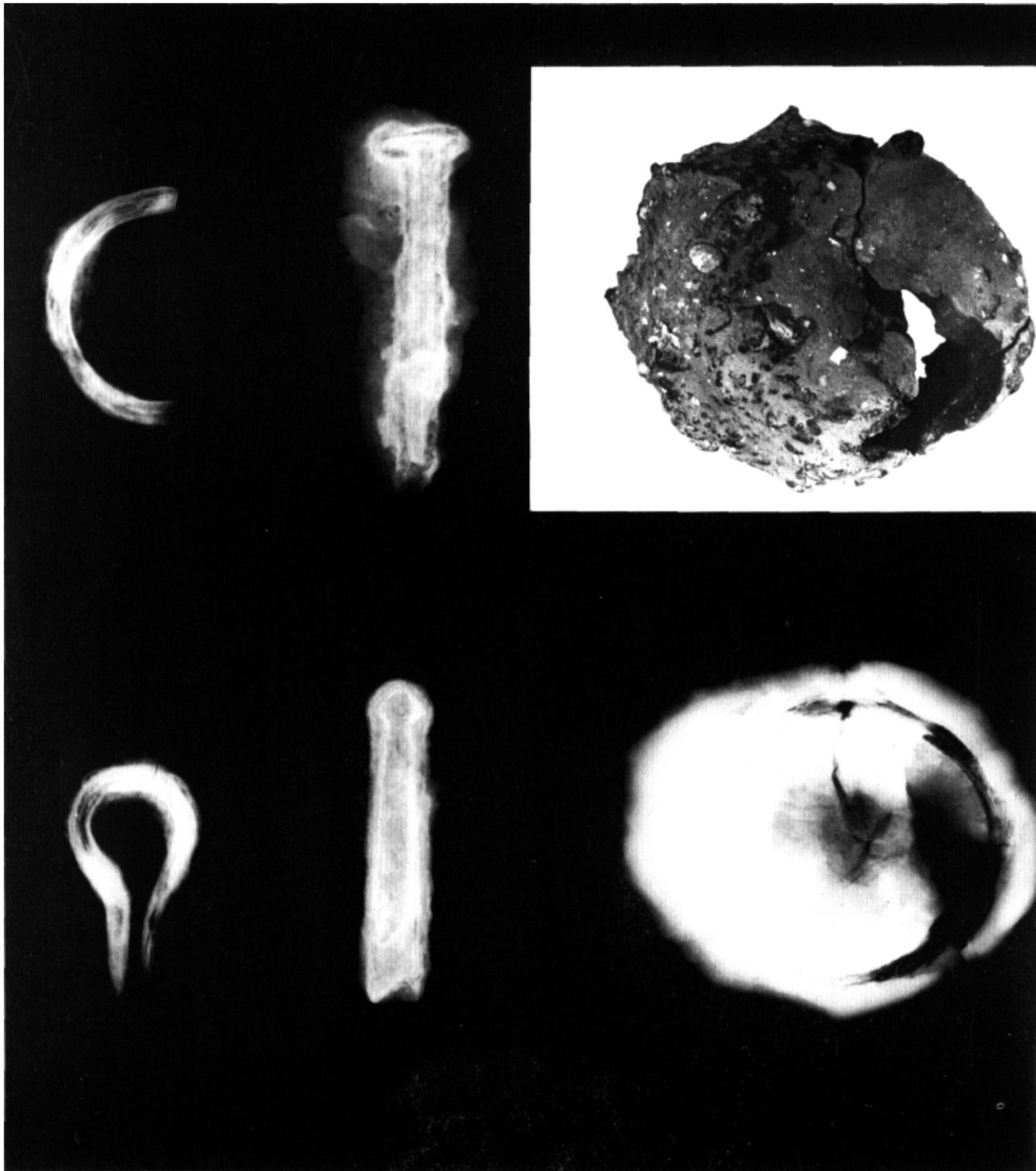
III Little Waltham: the settlements of Periods II and III in an advanced stage of excavation, seen from the north-west

Unless otherwise specified, photographs are of Little Waltham specimens, 1:1, and by Ancient Monuments Laboratory (Crown copyright reserved)

X-RADIOGRAPHS OF IRON OBJECTS (p 96)

Upper: partially hollowed
Left: Little Waltham IV ring fragment, AM 729603 (no 5.1)
Right: Wilderspool, Cheshire V nail, AM 761097

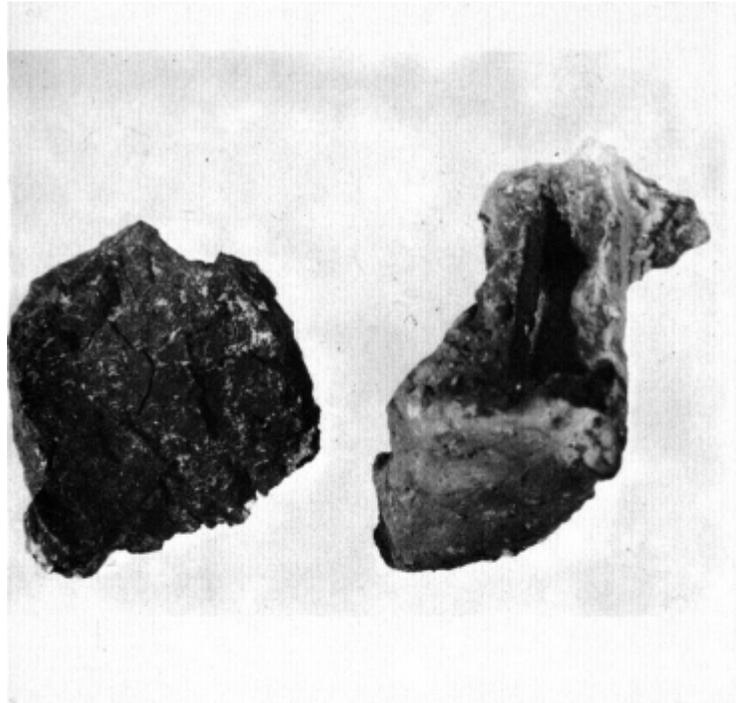
VOIDED IRON COLLAR, AM 729629 (p 98)
VIII general view, as received



Lower: extensively hollowed
VI staple, AM 729628 (no 5.32)
VII ballista bolt head, AM 761008

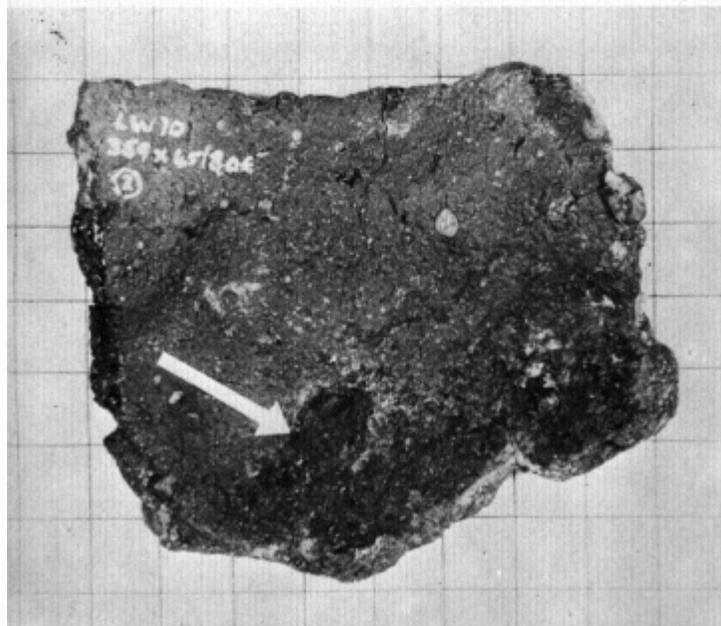
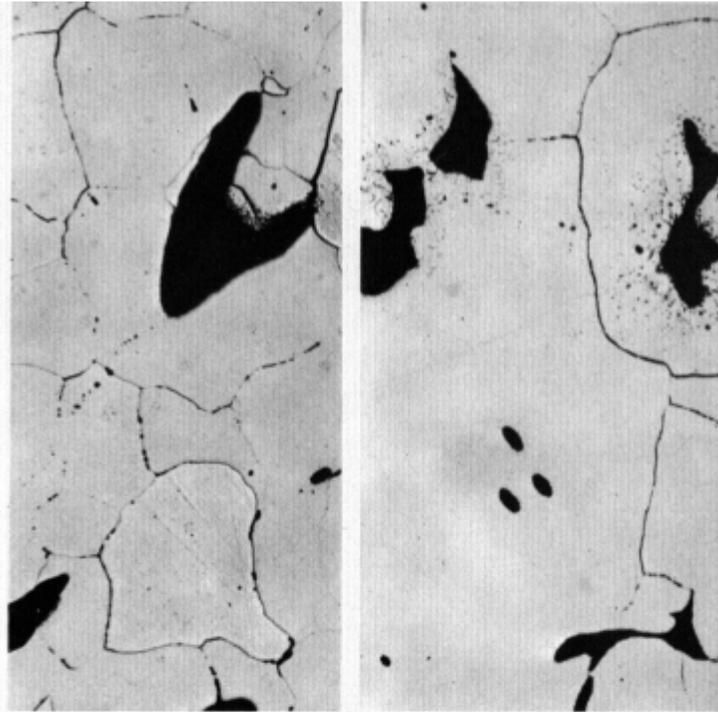
IX X-radiograph

X Voided iron collar, AM 729629 (p 98) showing hollow fracture



XI Bloomery iron, microstructure, AM 729545, x100 (p 115)

[Ph.: University of Newcastle upon Tyne]
(a) smaller fragment (b) larger fragment
Essentially similar structures showing large equiaxed ferrite grains with infrequent slag in large masses



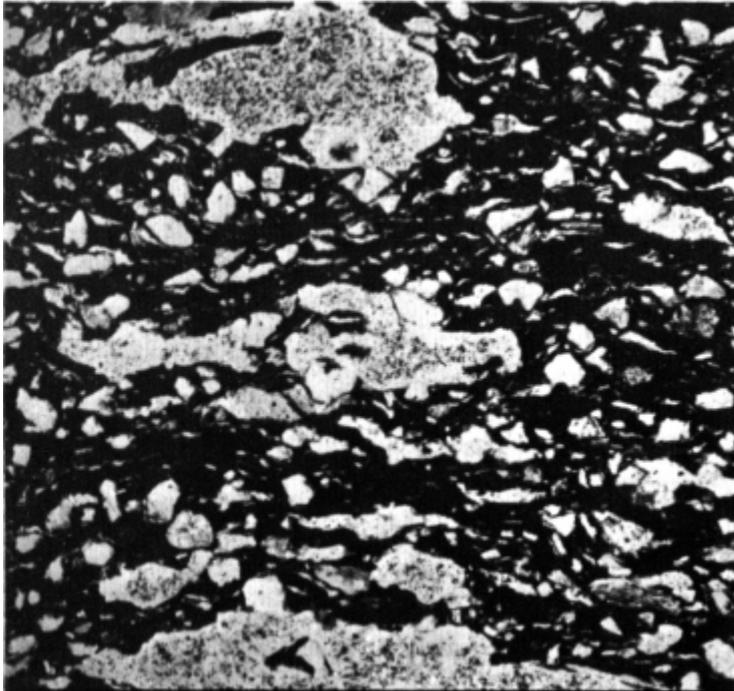
XII Pottery sherd no 315 (p 118) showing charred food residue
[Ph.: N E London Polytechnic]

XIII X-radiograph of burnt clay type a, no 4-32 (p 114).
Note slag-like vesicular texture

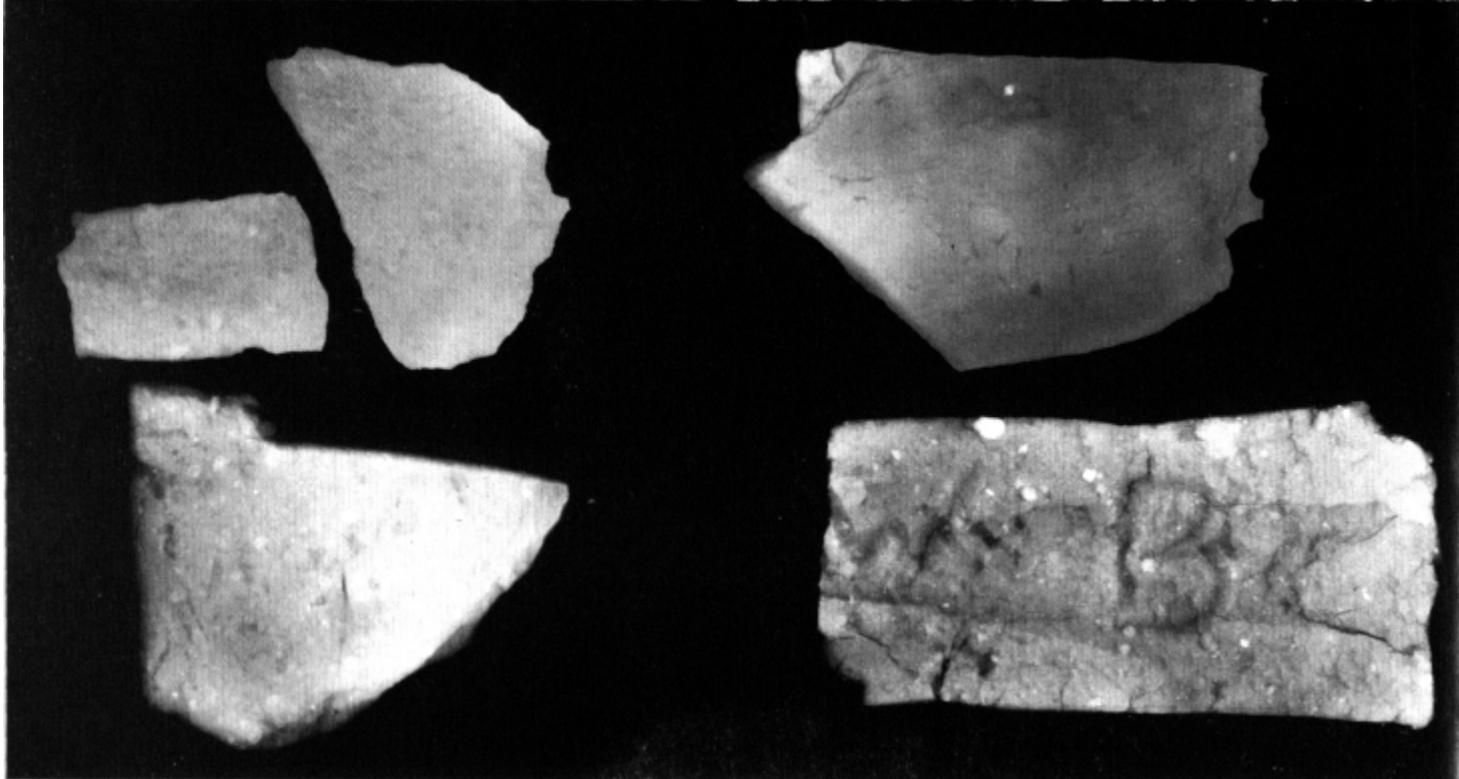
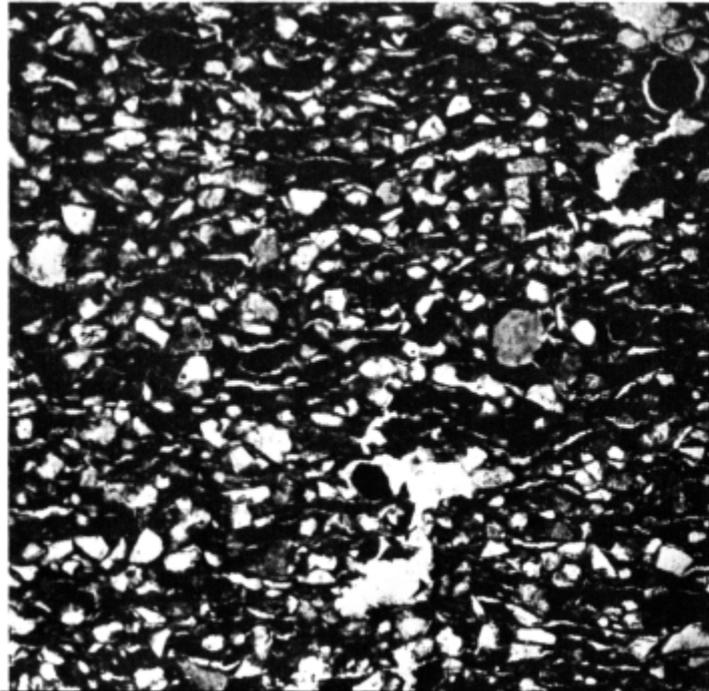
PHOTOMICROGRAPHS OF THIN SECTIONS OF

PLANE POLARIZED

*XIV Type C fabric, no 261, showing frequent well-sorted subangular quartz grains (small white), flecks of mica, and fragments of flint (grey)
[Ph.: Building Research Station] (cf right)*



*XV Type D fabric, S-5. Numerous subangular well-sorted grains of quartz (small white) and also some (?) glauconite (slightly turbid)
[Ph.: Building Research Station] (cf right & left)*



Middle XVIII Type C fabric, no 261 (cf above, below)

XIX Type D fabric, S-5 (cf above & right)

Lower XXII Radiofabric type R3, no 53 (cf above & right)

XXIII Brickearth experimentally fired, S-11 (cf right & left)

X-RADIOGRAPHS OF BURNT AND
(p 59: cf amongst themselves,

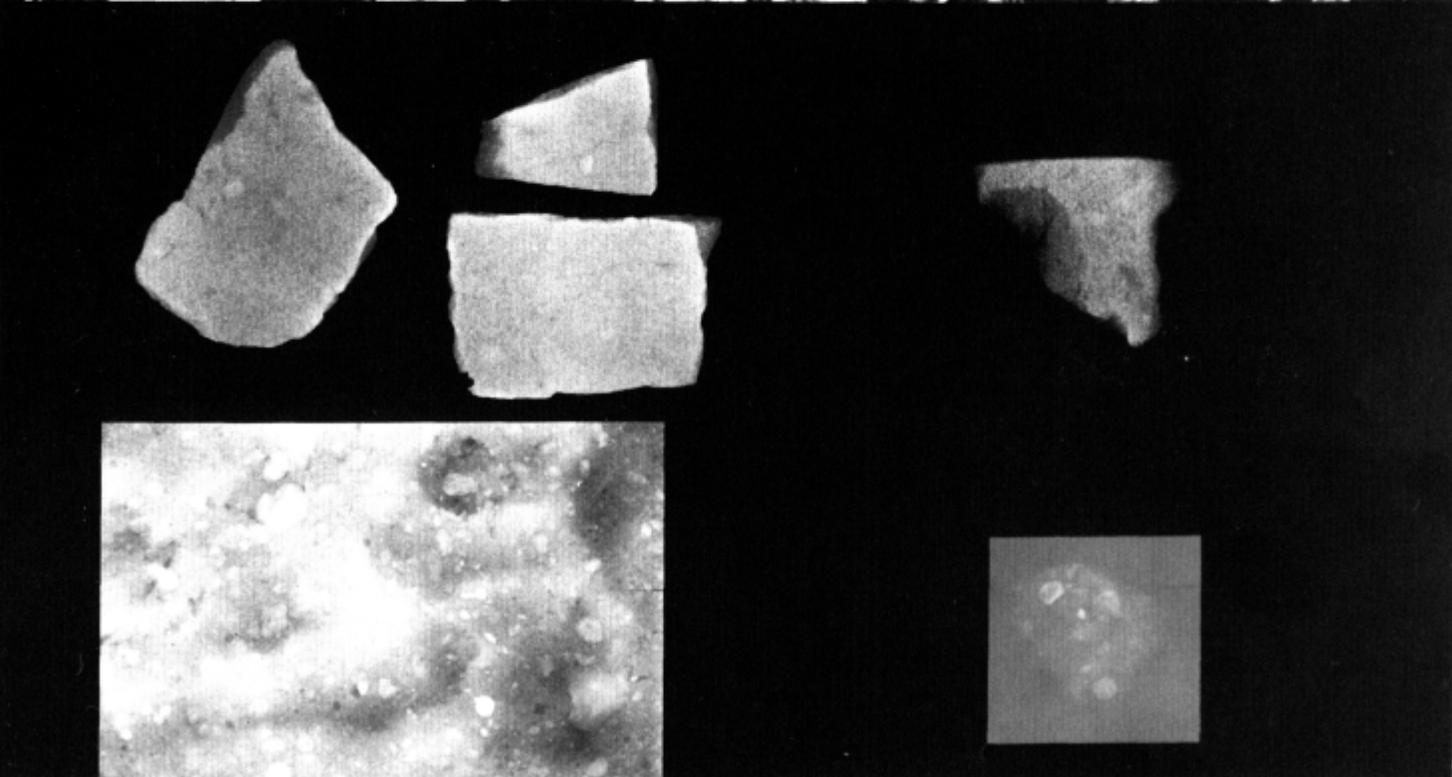
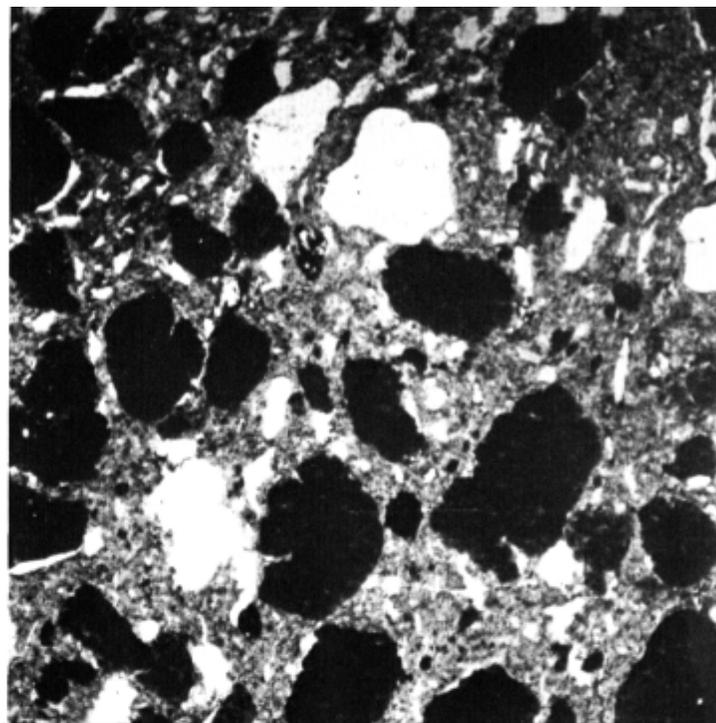
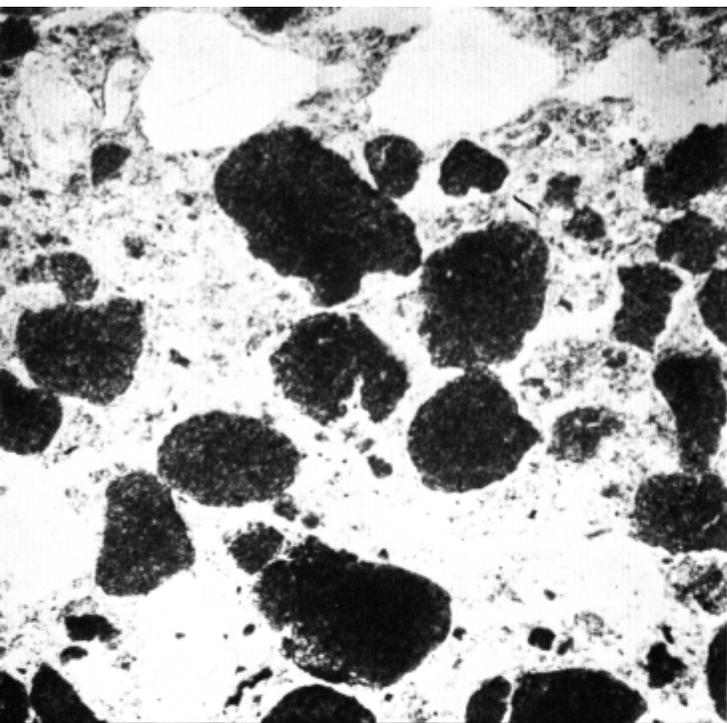
'FINE' AND 'SPECIAL' POTTERY (p 59, cf below)

LIGHT, X30

TYPE A FABRICS‡ ROUNDED PARTICLES OF WHAT APPEARS TO BE GLAUCONITE (TURBID). THE LIGHTER GRAINS ARE QUARTZ.

XVI Little Waltham, S-1 [Ph.: University of Southampton]

XVII Oldbury, Kent, S-20 [Ph.: Building Research Station]



XX Little Waltham, S-1 (cf above)

XXI Oldbury, Kent, S-20 (cf above)

Middle

XXIV Soil sample no 5 (p 7: cf right & left)

TYPE A FABRICS

XXV Burnt clay 'Cf R3' no 4-45 (p 114; cf left)

Lower

FIRED CLAY AND SOIL SAMPLES
photomicrographs above, and next page)

X-RADIOGRAPHS OF POTTERY RADIO-FABRICS AND BURNT CLAY (*pp 59, 114; cf amongst themselves and with previous, especially Pls XVIII & XXII-XXV*)

Upper *XXVI Radiofabric type R5, no 325*
Upper middle *XXVIII Radiofabric type R1, no 55*

XXVII Radiofabric type R7, no 85
XXIX Burnt clay 'Cf R1', no 4-18



Lower middle *XXX Radiofabric type R4, no 310*
Lower *XXXI London Clay experimentally fired, S-12*

XXXII Radiofabric type R2, no 24