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SUMMARY

The Museum of London Archaeology Service (MoLAS) was commissioned by Union Railways (South) Limited (URS) to undertake investigations and a watching brief of construction activities at Area 330 Archaeological Zone 4, from Wrotham Road, to Scalers Hill, south of Gravesend, Gravesham, Kent. This work formed part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL).

This zone, which covers 3.60km, extends from the eastern side of the dry valley containing the Wrotham Road (A227), across the flat 'heathland' of Tollgate/Singlewell, to the base of Scalers Hill to the west. The site showed evidence for:

Palaeolithic (c 450,000-50,000 BP)

- A pointed flint biface, or handaxe and a scatter of flint flakes were recorded in the evaluation South-East of Tollgate (ARC TLG 97). The finds were located within soliflucted deposits.

Late Glacial (c 12,000 – 8,000 BC)

- Late Glacial soils were recorded beneath soliflucted chalk, in the dry valley sequence from the sampling trench ARC TLG 98.

Late Neolithic - Early Bronze Age (c 2500 - 1600 BC):

- A group of sarsen stones, including a saddle quern of possible Neolithic or Bronze Age date were recorded. These remains probably represent part of a megalithic monument located to the east of Church Road, Singlewell.
- An unexcavated Neolithic mortuary enclosure was preserved *in situ* at Tollgate.

Mid to Late Bronze Age (c 1500 - 800 BC)

- An artesian well to the eastern mitigation area of Henhurst Road, which contained perforated clay slabs and pottery, indicating nearby settlement.

Late Bronze Age - Early Iron Age (800 - 500 BC):

- Rubbish pits and postholes, demonstrating occupation between the Tollgate mortuary enclosure to the west and Church Road, Singlewell to the east, were recorded.

Late Iron Age - Early Romano-British (100 BC to AD 100)

- Rubbish pits demonstrating continued occupation between the Tollgate mortuary enclosure to the west and Church Road, Singlewell to the east were recorded.
- Three ditches and a pit were located between Cobham Services Station and the Nook.

Prehistoric (of unspecific date)

- Two pits and a boundary ditch between Tollgate and the west side of Church Road; a boundary ditch on the eastern side of Church Road; and possible hollow way orientated from south to north to the western side of Henhurst Road were recorded.

Roman (1st to 4th century AD)

- A gravel road in a hollow way was exposed in two areas, one on either side of Henhurst Road. The road dates to the 1st century AD and is parallel to the ?later Watling Street (situated *c* 360m to the north). It is possible that the gravel road/hollow way is the first phase of Roman Watling Street, replaced at the end of the 1st century AD. When the gravel road goes out of use, it is crossed with a gravel surfaced 'droveway' oriented form south to north.
- Associated with the gravel road are a series of large 'artesian wells'. Most of these wells dated to the 1st century AD but one contained finds dated to the 2nd/3rd century AD.
- Ditches at the Nook, on the incline towards the base of Scalers Hill, were dated to the early Roman period.

Medieval (11th to 15th century)

- Boundary/droveway ditches were recorded on the eastern side, and parallel to Church Road.

- Ditches, pits and a hearth dating between 1050 and 1250, were recorded on the low-lying area on the eastern side of Henhurst Road.
- Medieval features and pits dating from 1100 to 1350 were recorded in the area of the Sarsen stones, possibly connected with their deliberate destruction.

Post-medieval and modern (16th to 20th century)

- Modern service trenches in the area of the West of Church Road, Singlewell evaluation.
- Large, sometimes multi-galleried, chalk mines were recorded to the east and west of Church Road.
- A brick kiln was recorded sunk into the chalk bedrock to the south of Cobham Services Station (17th/18th century). This was probably connected with the construction of houses/inns in the vicinity.

Artefactual and ecofactual material was recovered from the above features across the Zone. The zone is particularly relevant to the CTRL Research Strategy topics concerning Farming Communities (2000 – 100BC) and the Roman period; especially the Landscape Aim concerning of the impact and effect of Roman Watling Street.

1. INTRODUCTION

1.1 Project Background

1.1.1 The Museum of London Archaeology Services (MoLAS) was commissioned by Union Railways (South) Limited (URS) to undertake investigations and a watching brief of construction activities at Area 330 Tollgate, archaeological Zone 4, between Wrotham Road and Scalers Hill, south of Gravesend, Gravesham, Kent (Figure 1). This work formed part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL).

Table 1: Area 330 Zone 4 location details

Compass direction	URL Easting	URL Northing	NGR Easting	NGR Northing
North-west	47173.775	49740.094	567169.739	169741.689
South-east	44134.335	51020.928	564130.300	171022.523

1.1.2 Zone 4 lies between CTRL Chainage 41+000 and 44+300 and covers a length of 3.60km.

1.1.3 The topography of this zone, from west to east, comprises the eastern side of the dry valley containing Wrotham Road (A227) and the flat heathland area of Tollgate/Singlewell, to the base of Scalers Hill.

Table 2: List of Fieldwork Events

Event name	Event code	Type	Contractor	Dates
South-east of Tollgate	ARC TGS 97	Evaluation	MoLAS	1997
West of Church Road, Singlewell	ARC CRS 97	Evaluation	OAU	1997
Tollgate	ARC TLG 98	Excavation	MoLAS	1998
West of Church Road, Singlewell	ARC CRS 98	Evaluation	MoLAS	1998
West of Scalers Hill, Cobham	ARC WHS 98	Evaluation	OAU	1998
Package 330 Watching Brief	ARC 330 98	Watching brief	MoLAS	December 1998 to May 2000

1.2 Geology and Topography

1.2.1 The solid geology consists of Upper Chalk overlaid locally by the silty sands and sandy clays of the Thanet Beds (Figure 2).

1.2.2 The site is situated in the North Kent Plain, at the foot of the North Downs, but the local topography is varied. The western end of the zone is demarked by Wrotham Road (A227) and lies in a dry valley (40.96m OD). Eastwards is the open flat land of Singlewell (58.27-68.47m OD) leading to Henhurst Road (74.89m OD), where the ground begins to incline gently towards Ashenbank, the site of ancient woodland on the apex of Scalers Hill (113.81m OD).

1.2.3 The surface of the Upper Chalk undulates and where the gradient is shallower yellowish brown sandy silts and gravels overlay the chalk. Periglacial striations and run-off channels indent the slopes and are filled with silty clay containing flint nodules.

1.2.4 Colluvial deposits of relatively recent origin have accumulated on the lower slopes of the dry valley East of Wrothman Road. Colluvium was found sealing archaeological features from the Henhurst Road eastwards towards Scalers Hill.

1.3 Archaeological and Historical Background

1.3.1 A surface collection (field walking) survey was commissioned by URL and carried out in 1993 (URL 1994) producing slight scatters of artefactual evidence of struck flint, burnt flint, pottery and tile dating from the prehistoric through to the post-medieval period.

1.3.2 This was followed by a series of evaluations, excavations and the watching brief (Table 2). An area to the east of Henhurst Road (between the A2 and the CTRL works) and a potential Neolithic Mortuary Enclosure at Tollgate were preserved *in situ* (buried) and were not otherwise affected by the works.

2. ORIGINAL PRIORITIES, AIMS AND METHODOLOGY

2.1 Research Objectives

2.1.1 The site is located within the Landscape Zone of the North Kent Plain (A2 Corridor), to the east, in Area 330 Zone 5, the route commences to pass through the North Kent Downs (Scalers Hill). As such it was seen as a key area for studying the following Research Objectives:

Early Agriculturalists (4,500 – 2,000BC)

- Define the nature of the contemporary environment
- Determine the nature and effect of clearance for agricultural activity
- Define the ritual and economic landscapes and their relationships
- Determine the nature of and changes in economic lifeways *eg* relative importance of hunting-foraging and agriculture, studied especially through the recovery of faunal and charred plant remains

Farming communities (2,000-100BC)

- Determine spatial organisation of the landscape in terms of settlement location in relation to fields, pasture, woodland, enclosed areas and ways of moving between these
- Consider environmental change resulting from landscape organisation and re-organisation
- Determine how settlements were arranged and functioned over time

Towns and their rural landscapes (100 BC - AD 1700)

- What was the effect of the development of towns (eg London, Springhead) on the organisation of the landscape?
- Did population increase and concentration effect natural resource exploitation and accelerate environmental change?
- How were settlements and rural landscapes organised and how did they function?
- How did the organisation of the landscape change through time?
- Consider the effect on the landscape of known historical events, e.g. the arrival of Roman administration

2.2 Landscape Zone Priorities

2.2.1 In light of the above the following Landscape Zone Priorities were identified:

Reconstruction of the changing palaeo-environment for all time periods present, through 'on-site' and 'off-site' studies, and the interaction with past economies.

- The interaction of hunter-foragers with the natural environment
- Changes arising from the adoption of agricultural based economies
- The effects of 'urban' growth and the adoption of Roman ways and organisation in general
- The effects of and extent of clearance of the 'Wealden Wild Wood'
- Changes arising from early industrial economies

Spatial organisation of the landscape, and changes through time

- The socio-economic landscape of later agriculturists (2000-100 BC)
- The immediate pre-Roman - early Roman urban-rural landscape
  - Pre-Roman urban origins
  - The effect of the Roman administration on the established economic landscape
  - The impact and effect of the development of Roman Watling Street
  - Character, function and development of the rural urban fringe, and satellite uses

The late and immediate post-Roman landscape

- The decline of the urban economy and wider changes in the later Roman economy in general - how this is reflected in the archaeological resource, and its effect on rural settlement and economy

Ritual and ceremonial use of the landscape

- The environment of the Neolithic long barrow-mortuary enclosure at Tollgate

2.3 Fieldwork Event Aims

2.3.1 The Fieldwork Event Aims for the watching brief (ARC 330 98) Zone 4 were as follows:

East of Chainage 41+460 to 42+000

2.3.2 Previous evaluation within the area had recovered a low level of archaeological activity, probably associated with agricultural division of the area. Solifluction deposits were present on the site; and a Lower Palaeolithic pointed biface (hand axe) had been recovered, although this was in a redeposited context.

Primary aims (also those of the archaeological trench ARC TLG 98)

- to record changes in landscape division present within the site
- to recover palaeo-environmental data to determine the nature of the contemporary environment of the monument, a presumed Neolithic mortuary, and its immediate area
- to recover palaeo-environmental data to determine the nature of the contemporary environment of subsequent agricultural settlement in the area
- to relate the data recovered to the palaeo-environmental development of the A2 corridor
- to establish changes in the local environment through the recovery of suitable palaeo-environmental samples from the fill of cut features
- determine the form, function and chronology of occupation
- determine the spatial arrangement of occupation

Church Road to Scalers Hill Chainage 42+000 to 43+780

2.3.3 Previous evaluation within the area had recovered surface concentrations of prehistoric artefacts at the eastern end of the area. Geophysical survey of this part of the area had failed to locate any buried archaeological features. At the western end of the area ditches of a probable late Iron Age or Roman date, probably representing field boundaries, have been located.

Primary aims

- To record changes in landscape division present within the site
- to establish the date and sequence of landscape division

- to establish changes in the local environment through the recovery of suitable palaeo-environmental samples from the fill of cut features
- determine the spatial arrangement of occupation present within the area of investigation

2.4 Fieldwork Methodology and Summary of Excavation Results

2.4.1 In summary, the fieldwork consisted of fieldwalking, archaeological evaluation, excavation at Tollgate (ARC TLG 98) and recording. The methods of investigation were set out in a series of Written Schemes of Investigation, prepared by RLE, detailing the scope and methods of fieldwork and agreed with English Heritage and KCC on behalf of the local authority.

2.4.2 All features were partly or wholly excavated by hand and plotted using a pen-computer or planned on pre-printed gridded permatrace and related to the site grid. Individual contexts were recorded on pro-forma context sheets. Sections were drawn on pre-printed, gridded sheets of draughting film and the section positions accurately plotted using a total station.

2.4.3 A photographic record was kept of individual archaeological features and sections, appropriate groups of features and structures. Finds were bagged and retained and environmental samples, both bulk and column, were taken where necessary from features and deposits.

2.4.4 In summary the excavations revealed:

Palaeolithic (c 450,000-50,000 BP)

2.4.5 A pointed flint biface, or handaxe and a scatter of flint flakes were recorded in the evaluation South-East of Tollgate (ARC TLG 97). The finds were located within soliflucted deposits.

Late Glacial (c 12,000 – 8,000 BC)

2.4.6 Late Glacial soils were recorded beneath soliflucted chalk, in the dry valley sequence from the sampling trench ARC TLG 98.

Late Neolithic - Early Bronze Age (c 2,500 – 1,600 BC)

2.4.7 A group of sarsen stones, including a saddle quern of possible Neolithic or Bronze Age date were recorded. These remains probably represent part of a megalithic monument located to the east of Church Road, Singlewell.

2.4.8 An unexcavated Neolithic mortuary enclosure was preserved *in situ* at Tollgate.

Mid to Late Bronze Age (c 1,500 - 800 BC)

2.4.9 An artesian well to the eastern mitigation area of Henhurst Road, which contained perforated clay slabs and pottery, indicating nearby settlement.

Late Bronze Age - Early Iron Age (800 - 500 BC)

2.4.10 Rubbish pits and postholes, demonstrating occupation between the Tollgate mortuary enclosure to the west and Church Road, Singlewell to the east, were recorded.

Late Iron Age - Early Romano-British (100 BC to AD 100)

2.4.11 Rubbish pits demonstrating continued occupation between the Tollgate mortuary enclosure to the west and Church Road, Singlewell to the east were recorded.

2.4.12 Three ditches and a pit were located between Cobham Services Station and the Nook.

Prehistoric (of unspecific date)

2.4.13 Two pits and a boundary ditch between Tollgate and the west side of Church Road; a boundary ditch on the eastern side of Church Road; and possible hollow way orientated from south to north to the western side of Henhurst Road were recorded.

Roman (1st to 4th century AD)

2.4.14 A gravel road in a hollow way was exposed in two areas, one on either side of Henhurst Road. The road dates to the 1st century AD and is parallel to the ?later Watling Street (situated *c* 360m to the north). It is possible that the gravel road/hollow way is the first phase of Roman Watling Street, replaced at the end of the 1st century AD. When the gravel road goes out of use, it is crossed with a gravel surfaced 'droveway' oriented form south to north.

2.4.15 Associated with the gravel road are a series of large 'artesian wells'. Most of these wells dated to the 1st century AD but one contained finds dated to the 2nd/3rd century AD.

2.4.16 Ditches at the Nook, on the incline towards the base of Scalers Hill, were dated to the early Roman period.

Medieval (11th to 15th century)

2.4.17 Boundary/droveway ditches were recorded on the eastern side, and parallel to Church Road.

2.4.18 Ditches, pits and a hearth dating between 1050 and 1250, were recorded on the low-lying area on the eastern side of Henhurst Road.

2.4.19 Medieval features and pits dating from 1100 to 1350 were recorded in the area of the Sarsen stones, possibly connected with their deliberate destruction.

Post-medieval and modern (16th to 20th century)

2.4.20 Modern service trenches in the area of the West of Church Road, Singlewell evaluation.

2.4.21 Large, sometimes multi-galleried, chalk mines were recorded to the east and west of Church Road.

2.4.22 A brick kiln was recorded sunk into the chalk bedrock to the south of Cobham Services Station (17th/18th century). This was probably connected with the construction of houses/inns in the vicinity.

2.4.23 Artefactual and ecofactual material was recovered from the above features across the Zone.

2.5 Assessment Methodology

2.5.1 This assessment report was commissioned by URS to the specification for assessment reports produced by RLE (CTRL Section 1 Archaeology: Post excavation Assessment Instruction no. 000-RMA-RLEVC-00030-AB), as discussed with English Heritage and Kent County Council. The production of this assessment was managed by Niall Roycroft and Gordon Malcolm and all specialist advice was provided by the Museum of London Specialist Services.

3. FACTUAL DATA AND QUANTIFICATION

3.1 The Stratigraphic Record

3.1.1 The archaeological evidence consisted of intrusive features (pits, ditches, postholes etc) that were either recognised immediately topsoil was removed or sealed by a colluvial subsoil. To the west of Henhurst Road *in situ* horizontally stratified deposits and cut features were found in places.

3.1.2 Several foci of activity were identified, indicating changing patterns of land use over time (Figures 3a to 3c). Within these areas the percentage of survival or intensity of activity varied: in some the evidence was fairly dispersed and there was little intercutting of features that would otherwise have allowed a better understanding of the stratigraphic sequence. In other areas stratigraphic relationships exist which provide the basis for phasing the archaeological sequence. The results of the fieldwork can be summarised by period, as follows:

Palaeolithic (c 450,000-50,000 BC)

3.1.3 A flint handaxe [3] from soliflucted deposits South-East of Tollgate (evaluation ARC TGS 97) and represents the earliest artefactual evidence found on the site (Figure 5). The fresh condition of the object suggests that, although residual in context, it had not been transported far. Perhaps associated with the hand axe was a scatter of struck flint flakes, also implying that the original point of deposition was not very distant.

Late Glacial (c 12,000 – 8,000 BC)

3.1.4 Late Glacial soils were recorded beneath soliflucted chalk, in the dry valley sequence from the sampling trench ARC TLG 98.

Late Neolithic-Early Bronze Age (c 2,500 – 1,600 BC):

3.1.5 A concentration of up to 40 substantial sarsen stones (excluding a great number of smaller fragments less than 0.50m x 0.30m) was recorded spread in concentrations over an area roughly 75m in diameter (Figures 8 and 9, Plates 1 and 2). The main stones varied in size:

- large (three in total), measuring *c* 1.5m x 1.5m x 0.60m,
- medium (six in total) ranged in size from 2.39m x 0.77m to 0.50m x 0.67m and included a saddle quern [666] of possible Neolithic or Bronze Age date.
- small (30 in total; thought to be broken remains of larger stones) *c* 0.50m x 0.30m.

3.1.6 The tops of the larger stones (Plate 1) were generally exposed beneath modern, ploughed, topsoil but the bases rested upon a land surface sealed by a more ancient colluvial deposit. Where this more ancient level/surface had slumped into underlying solution features, a great number of smaller stone (less than 0.20m x 0.10m) fragments (Plate 1, on the right) were evident. Sarsen stones are not natural to the area, nor are they local (the nearest known outcrop being near to White Horse Stone, approximately 11km to the south-east, on the opposite side of the River Medway). It is certain that this group does not represent a natural 'sarsen field'.

3.1.7 It is possible that these stones form the remains of a megalithic monument(s) – with the large (main) stones being fallen orthostats and the smallest fragments

representing the remains of dry stone kerb walling. It is noted that no large quarry ditches were located. On site discussion also included the possibility that the stones represented field clearance, but the 'fallen' pattern of the southern group (I) (Plate 1), linked with the huge saddle quern (Plate 2), which was definitely *in situ*, would tend to favour the monument theory. In addition the saddle quern has a rippled surface which may indicate it was also used as an axe polishing stone. Furthermore, the size and shape of the larger stones are slab-like as opposed to the rounder shapes which tend to occur naturally.

3.1.8 The scatter of stones had been arranged in three rough groups. The southern-most group (Group I) was represented by large slabs on bed, dipping from south to north (Plate 1). Between the large stones were numerous small sarsen fragments. Of significance was the fact that two of the largest stones lay one on top of the other, and a third was almost upright, but sunk into a solution hollow in the chalk. These positions are very unlikely to have been achieved by a field clearance operation. It seems possible that these stones represent a roofed chamber of a similar type to Kits Coty. This group has been preserved *in situ* beneath the re-aligned Church Road.

3.1.9 Approximately 20m to the north lay a group of smaller sarsen fragments (Group II) adjacent to a very large pit (Plate 2). This pit was subjected to OSL dating and the date range for the final filling was from *c* 120BC $\pm$ 200 years. Within Group II was the saddle quern [666], which could date from the Neolithic through to the Roman period, with a distinctive worn, convex upper face, caused by grinding grain with a smaller stone (Plate 2). A number of transverse grooves may represent incisions caused from the sharpening of stone axes or other implements. The saddle quern is of a very large size (0.92m x 0.36m x 0.34m.**)** and was still set in the ground when discovered.

3.1.10 Groups I and II were briefly exposed and recorded and were then sealed (preserved *in situ*) beneath the construction works (Figure 9).

3.1.11 To the north-east of these two groups, eight stones (Group III) of varying lengths and widths were found, the longest just over 2m long. These stones had evidently been moved and some (five in total) had been subject to burning; others showing sharp, apparently 'fresh', breaks and occasionally plough strikes. It is therefore likely that the structure was subject to deliberate destruction and has been hit by modern farm equipment in the recent past. The stones were redolent of the shape of orthostats seen forming facades of Neolithic chambered tombs, similar to Waylands Smithy and West Kennet in Wiltshire.

3.1.12 Neolithic monuments exist in Kent. The nearest is the mortuary enclosure at Tollgate (Figure 4); and on the other side of the A227 a double Beaker burial has been uncovered (Area 330 Zone 3, ARC WNB 98 although no upstanding structure was found). The main known monuments form part of a group of chambered tombs in the Medway valley (the 'Medway Megaliths'), the nearest of which lies approximately 11.5 kilometres to the south-east at Kit's Coty and Kit's Coty House. Elsewhere, at Addington (c15km to the west of Singlewell), the remains of a long mound/barrow with massive orthostats along its edge with large slabs, fallen prone were found (Daniel, 1950).

3.1.13 No evidence for either an associated mound or ditch was found at the Singlewell site. The former, had it existed, is likely to have been ploughed out during successive agricultural activity.

3.1.14 The fragmented nature of the stones, and the signs of burning to the third group, suggests deliberate destruction some time in antiquity. One of the stones in the third group was found redeposited in a pit containing burnt material with pottery dating to the 12th/13th century. Destruction of prehistoric stone monuments such as Avebury is known to have taken place in earnest from the 13th and 14th centuries, in a drive by the church against paganism. Stones were either felled into pits dug specifically for that purpose or they were broken up, The latter method often involved building a fire around the stones, which was dowsed in water, causing them to crack, which made demolition easier.

3.1.15 There is no evidence for other Early Bronze Age activity in the immediate vicinity of the sarsen stones. The absence of any domestic or agricultural occupation may indicate that the area was a focus of ceremonial and ritual importance.

Mid to Late Bronze Age (c 1500 - 800 BC)

3.1.16 The only evidence for this period in Zone 4 was a pit [537], located on the eastern side of Henhurst Road within the mitigation area and dated by pottery to *c* 1150 - 800 BC (Figure 10). In addition to the pottery, eighteen fragments of perforated clay slab were found. The pottery and perforated slabs indicate that there was a settlement in the immediate vicinity. The pit that the material came from is probably an artesian well, of which there are many later (Roman) examples in the immediate vicinity. 'Well' is still mentioned in the local place name 'Singlewell'.

Late Bronze Age-Early Iron Age (800 - 500 BC)

3.1.17 The earliest actual occupation evidence within Zone 4 dates to the Late Bronze Age/Early Iron Age, concentrated to the west of Church Road, Singlewell. (Figures 5, 6, 7 Chainage 41+780 – 42+110). The evidence consists of three groups of pits. The most northerly (Group I) lies some 30 metres south of the A2 and consists of six rubbish/storage pits. Approximately 25 metres further south three pits (Group II) were recorded (Figures 6 & 7). The third group (Group III), six in number, lay 40 metres further to the west (Figure 5).

3.1.18 Pit Groups I and II produced domestic refuse in the form of pottery and animal bone, antler, together with quantities of fired clay/daub. In addition one of the pits (northern group), produced a diversity of other finds, including a polishing stone (hone), a handle made from antler, a possible arrowhead/spear tip and a brooch provisionally dated to the 3rd century BC (La Tene 1). One of the pits in this group may be belong to a later, transitional period of activity as it produced pot dating to the Early Iron Age (500 - 300 BC). One of the pits from the southern group produced a further hone. This pit also evinced a clay lining suggesting that it was initially a storage pit. Group III differed, as they did not produce the diversity in the backfill type or the nature of the finds which consisted solely of pottery.

3.1.19 Other evidence of possible occupation consists of a series of pits, numerous postholes and a boundary ditch, all undated, but located in the vicinity of the Group 1 pits. The clusters of postholes may be evidence for timber huts, fences/windbreaks or animal pens.

Mid-late Iron Age (300 - 50 BC)

3.1.20 Evidence for this period lies in cut features from Mid to Late Iron Age pits within the Group I conurbation at Church Road, Singlewell indicating a certain degree of continuity of settlement (Figure 7). A brooch provisionally dated to the 3rd

century BC (La Tene 1) was recovered from a pit [374] containing abundant pottery dated solidly to the Late Bronze Age/Early Iron Age. At this stage it is not possible to say whether occupation of the settlement site was continuous from the Late Bronze Age/Early Iron Age into the Mid-Late Iron Age or whether the brooch was intrusive.

Late Iron Age-early Roman (1st century BC to 1st century AD)

3.1.21 Occupation in the area of Church Road, Singlewell, began in the Late Bronze Age/Early Iron Age and appears to have continued into this period, although the evidence is limited. Two pits of this date [508] and [551] (Figure 7) and a third, [103] to the west, found in the evaluation South-East of Tollgate (ARC TGS 97) indicate continued activity (Figure 5).

3.1.22 In the area of the Tollgate mortuary enclosure a number of ditches, small pits, postholes and hearths may relate to this period, but are mostly undated (Figure 4).

3.1.23 There was some evidence for occupation in the area of the sarsen stones where a probable artesian well was sited (Figure 9). This large pit [630] contained prehistoric pottery fragments, Roman pottery (100BC to AD 100) and lava quern stone fragments . The presence of the lava quern fragments is very interesting, as the pit is located immediately next to the sarsen stone saddle quern.

3.1.24 The evaluation West of Scalers Hill (ARC WSH 98) located two ditches. The dating evidence indicates a date range between 100BC and AD 100.

3.1.25 The pottery comprises ‘native’ style wares of the late Iron Age and a smaller amount of early Romanised wares. The occupation in both these areas probably had its origins in the pre-Roman Iron Age and continued in use into the Roman period. The pottery evidence indicates occupation in these areas ceased before c. AD 70.

3.1.26 In the area of the later Roman Road to the west of Henhurst Road was a large, linear feature [847] orientated from south to north. This feature may represent a type of erosion hollow and may possibly be the remains of a Late Iron Age/Early Roman road (Figure 10).

Roman

3.1.27 There was one main focus of activity in the Roman period located in mitigation areas to the east and west of Henhurst Road. The activity was dated to the early Roman period AD 40 - 100 (Figure 10). During this period a gravel road [933], 3.20m wide, aligned east to west was constructed (located to the west of Henhurst Road and subsequently preserved *in situ*, Plate 3) with associated boundary ditches forming enclosures. The road passed over the large Late Iron Age/Early Roman north to south boundary feature [847] mentioned above.

3.1.28 It seems that the road quickly began to ‘sink’ into the soft underlying silts and had formed a shallow hollow way in this area. At least two phases of road construction were recorded. Both were of rammed gravel with distinctive wheel ruts and repairs. The westward continuation of the road was not identified and appears to have been truncated in the past. It is likely that the road continues beyond the limit of excavation to the east.

3.1.29 To the east of Henhurst road a massive sunken, linear feature [522] orientated from east to west, was recorded, measuring 6.65m wide x 1.10m deep. At the base of the hollow was a layer of gravel metalling, 2.60m wide, representing a

road level**.** This feature potentially forms a hollow way, which took the road up the rising land to the east towards the Cobham Hall side of Scalers Hill.

3.1.30 Due to the east to west alignment of the gravel road and hollow way, it is possible that these road sections represent the form of 'Watling Street' during the 1st century AD. If this is the case then it shows the line of the road may have skirted round the lower, southern, levels of Scalers Hill, near to Cobham Hall, avoiding the Thanet and Blackheath etc Beds, before turning and proceeding to Rochester. The later Roman Road 'Watling Street', perhaps constructed towards the end of the 1st century AD, took the more rapid line over the top of Scalers Hill.

3.1.31 If the road was put together rapidly, or took the basic route from a Late Iron Age precursor, then the narrowness of width need not be a problem, especially as that recorded was the last, eroded, phase. The amount of uses that this road had, probably ensured the rapid deterioration of the surface. It is, however, also possible that the road was aligned parallel to Watling Street situated c. 360m to the north at this point.

3.1.32 Adding to the 'main arterial road' argument are the number of artesian wells, four in all [293], [521], [539], and [865], located on either side of the road/hollow way at Henhurst Road. Three of them averaged 6.50m in diameter and 4.5m + deep (actual depth not reached). These would have provided water to travellers and animals (in a similar way to the medieval/post/medieval St Thomas's Well and pond in Area 330 Zone 5 at Scalers Hill). The main period for the wells appears to be the 1st century AD but one well contained pottery dated to the 2nd/3rd century AD.

3.1.33 The gravel road to the west of Henhurst Road was soon covered with a layer of silts and the gravels became subject to erosion and partial dispersal. The east to west road then goes out of use and a new road/droveway, aligned from south to north, cuts through it. Associated with this droveway is an area of gravel surfacing to the south (only partially exposed) and some large ruts [748]. This road appears to have a distinctive 'kink' in it but pottery dates are still AD40 to 100. The impression is that the Late Iron Age/Early Roman north to south road is cut by the east to west gravel road, which soon sinks into the ground and becomes flooded. This gravel road is then abandoned and the north to south road/droveway is recreated.

3.1.34 It is interesting to note that the alignments of boundary ditches and enclosures in the two areas differed slightly. The alignment of modern Henhurst Road, which bisects the two areas, changes slightly along its north-south course from approximately 240 metres south of Marling Cross. Southwards from here it shifts further to the west. All the archaeological linear features found on the west side of the road all reflect the north-south alignment, whilst those on the east follow the southern alignment. It is therefore possible that Henhurst Road has its roots in the Roman period. These alignment grids are also still reflected in the modern A2, which has a slight alignment alteration at Henhurst Road.

3.1.35 Elsewhere in Zone 4, the evidence for this period is sparse. On the east side of Church Road a posthole [584] was broadly dated to the Roman period and to the west of Scalers Hill, two ditches [263] and a pit [161] were dated to no later than the 1st century AD (Figure 11).

Medieval

3.1.36 Activity for the medieval period was sparse and dispersed but two foci were identified; one at Church road and one to the east of Henhurst Road (Figures 6 & 8). Pottery dating indicates that activity at the former occurred between 1050-1250, whilst the latter occurred mainly in the period 1100-1350.

3.1.37 In the Church Road area three pits [463], [1148], [1211] (not shown) and a boundary ditch [806] were recorded, the latter just to the east of Church Road (Figure 8). One of the pits, [1148] located in the vicinity of the group of sarsen stones is thought to be associated with the destruction of a megalithic monument in the 13th century (Figure 9). The majority of the pottery from the pits and the ditch dates between the 11th and 13th century.

3.1.38 To the eastern side of Henhurst Road the evidence consists of four boundary ditches, two pits and a hearth. Occupation appears to be largely associated with agricultural practice (Figure 10). Much of the pottery evidence dates between the 12th and 14th century.

Post-medieval

3.1.39 Dispersed pits and ditches of post-medieval date were located throughout Zone 4. With the exception of one feature, these are of limited significance and no further discussion of them is warranted.

3.1.40 At Henhurst Dale, at the base of Cobham Services Station, a rectangular brick-built kiln [720] with a stokehole was located (Figure 11, Plate 4). The internal area of the structure comprised three flues, fed from the south by a stokehole. The kiln may have been used for making bricks or tiles and is dated to the post-medieval period.

3.1.41 Its location adjacent to Watling Street may indicate that it is associated with the manufacture of bricks for the numerous 17th century inns and houses that were beginning to be constructed in this area from that time onwards.

3.1.42 To the west and east of Church Road were chambered mines (Figures 7, 8 & 9). The former [967] consisted of ten chambers radiating from a central shaft chamber, the sides of which were vertically cut (Figure 7, Plate 5). To the east lay a four-chambered mine [1439] (Figure 9). These mines are numerous in Kent and are presumed to be either medieval or post-medieval in date.

3.2 The Artefactual Record

Ceramics
Prehistoric and Roman Pottery

3.2.1 The excavation area Zone 4 produced a moderate assemblage, with pottery dating from the Late Bronze Age/early Iron Age, Mid Iron Age and Late Iron Age/Early Roman, as well as later Roman material. The assemblage was recovered from settlement features including a trackway, occupation deposits, ditches, pits and postholes.

Post Roman pottery

3.2.2 A small assemblage of domestic pottery dating to the mid-12th to later 13th century was recovered from ARC 330 98. No medieval or later pottery was found in the ARC CGC 98 excavation, but one sherd of medieval pottery was recovered from a colluvial deposit at ARC CRS 98, while five post-medieval sherds were found in two modern contexts. The finds from ARC 330 98 comprise a group of 99 medieval sherds found in ten different contexts during the watching brief, most of which dates to the late 12th to early 13th century, and 15 sherds from up to 13 pots recovered from three areas of chainage work. Most medieval sherds are from shell-tempered kitchen wares dating to 1180-1250, but one is from a jug which was probably made in London. Later material comprises single sherds dating to the late 14th or 15th century, the late 15th or 16th century, and the late 18th century. The medieval material is similar to that from West Northumberland Bottom and other sites in the area, and with them can be used to consider the development of settlement in this part of north Kent.

CBM and Fired Clay

3.2.3 A total of 29.758 kg of building material (2790 items) was recovered from ARC CRS 98 and ARC 330 98. The building material from ARC CRS 98 comprised 21 items (280grams) from 3 contexts, consisting of 5 grams of wall tile, 1665 grams of daub and 20 grams of roofing tile (probably peg tile). The remaining 10 grams were of unidentified fired ceramic. The material from ARC 330 98 comprised 2744 items from 62 contexts. This comprises 18360 gm of post-medieval brick, 1380 grams of medieval or post-medieval peg roofing tile, 310 grams of Roman roofing tile. The vast majority of the remaining material is daub of uncertain date. The Chainage material (unstratified) weight 685gms and comprises 25 fragments, mostly peg roofing tile plus two possible fragments of post-medieval brick (20grams).

Lithics

3.2.4 A total of 35.985 kg of flint was recovered from ARC TLG 98, ARC CRS 98 and ARC 330 98. The majority, 1664 pieces, consisted of burnt unworked flint and the remainder, 252 pieces, were worked flint. The assemblage came from a limited number of contexts and was relatively undiagnostic in character. Although there is little within the groups that would suggest ritual activity *per se*, some may have been used in ritual activities or activities associated with the monuments at Tollgate and Church Road. As a group the material is not closely datable, a few soft-hammer struck flakes, and blade-like flakes may indicate Neolithic activity but the retouched forms recovered could equally belong to the earlier Bronze Age.

Stone

3.2.5 A total of 5 stone artefacts were recovered from ARC 330 98 Zone 4. These consisted of a flint sphere, a hone, fragments of a lava stone quern, a smoothing stone and a saddle quern. The saddle quern could date from the Neolithic to the Iron Age and is a very large example of the type. Transverse 'ripples' on the surface could also represent its use as an axe polishing/sharpening stone.

Glass

3.2.6 An unstratified glass bead was recovered from ARC 330 98 Zone 4.

Metalwork

3.2.7 A total of 17 accessioned metal artefacts were recovered from ARC 330 98 Zone 4, all made of iron.

Coins

3.2.8 A total of 2 coins were recovered from ARC 330 98 Zone 4. Both were from unstratified contexts and were made from copper alloy. They date to the Roman and post-medieval periods.

Ceramic artefacts

3.2.9 A total of eighteen perforated clay slabs (function unknown) were found during the ARC 330 98 watching brief, all Bronze Age in date.

Worked bone

3.2.10 Two worked bones were recovered from ARC 330 98, both made from antler; a handle and a waste fragment.

3.3 The Environmental Record

Animal Bone

3.3.1 This Zone produced a 6.12kg (788 fragments) of animal bone from hand collection and from sampling. Most of these were recovered from 56 hand-collected contexts and the remaining from 43 samples. The bones were in a good state of preservation and displayed potential for species representation, interpretation of the local environment, and for butchery.

Macroscopic plant remains & charcoal

3.3.2 A total 149 samples have been assessed for plant remains, all from ARC 330 98. These samples came from a wide variety of features were sampled, including ditches, pits, hearths/ovens and ranged in date from Late Bronze Age/Early Iron Age, Late Iron Age/Early Roman. Roman and medieval. The contents consisted mainly of charred wood with poorly preserved charred grain and seeds. The assemblages will help to determine the diet, economy and plant husbandry.

Mollusca

3.3.3 Three sites (ARC TGS 97, ARC TLG 98 and ARC 330 98) in Zone 4 produced a total of 129 shells. The assemblage consisted of terrestrial species with no freshwater forms. The group has only a limited potential for study.

Geo-archaeology - Tollgate

3.3.4 Monolith samples were taken through a sequence of dry valley sediments in the excavation area ARC TLG 98, located at the western end of Zone 4. Assessment of these monoliths has identified a Late Glacial arctic soil from Thanet Beds, eroded from the surrounding landscape after the valley was cut. This was succeeded by the deposition of soliflucted coombe rock of the Holocene when soil formation occurred possibly in colluvial material derived from loess.

3.4 Dating

Radiocarbon

3.4.1 Several of the LBA/EIA pots retained carbonised organic residues, that could be sampled for radiocarbon dating.

Dendrochronolgy

3.4.2 No Dendrochronology samples were taken.

Luminescence

3.4.3 Six samples were taken, three from sediments beneath sarsen stones and three from colluvium in an 'artesian well', located adjacent to the Sarsen stones, to the east of Church Road, Singlewell. The feature appears to have filled gradually with waterlain sediments. The OSL date was 120BC± 200 for the start of infilling. Results from the sediments below the sarsen stones were incompletely bleached and no dates were determined; it is likely that these were Late Glacial fills of a solution feature.

3.5 Archive Storage and Curation

3.5.1 The stratigraphic archive has been microfilmed and can be prepared for long term storage. The contexts have been entered onto the MoLAS Oracle database, and subsequently transferred to RLE Datasets.

Finds and environmental archive

3.5.2 The majority of the archive is not in need of any significant treatment to enable it to be put into long-term storage. There are a few points that should be made (see below).

3.5.3 Some of the key pottery vessels would benefit from reconstruction or consolidation to allow display and to aid research and illustration.

3.5.4 The perforated clay slabs should be accessible to enable comparisons to be made with examples from other sites in Kent, London and East Sussex.

3.5.5 The X-radiograph suggests that some consolidation of the La Tene I iron brooch ARC 330 98 <90> [373] and <76> [538] will be necessary during the recommended investigative cleaning, to stabilise them. It may also be necessary to apply a tannic acid solution corrosion inhibitor to these finds, post cleaning. Both coins from ARC 330 98 have been conserved by the Museum of London Specialist Services. One object <33> [811] required a gap-fill to protect it from physical damage.

3.5.6 The stone artefacts from ARC 330 98 will require identification. The saddle quern <108> [666] is of particular interest for comparison with Neolithic examples. The ARC 330 98 example is provisionally identified as unusually large for the type. Also the possibilities for it being used as a polishing/sharpening stone need to be addressed.

3.5.7 The glass bead from ARC 330 98 is in stable condition and no conservation work is necessary.

3.5.8 If thin sections are made of the monolith samples they will take up less storage space, stand a better chance of long term preservation and be amenable to a similar method of archiving to that for finds and environmental samples. As monoliths, the samples are not easily stored, need to be kept in a cool to cold and dark environment and are likely to deteriorate with time. Thin sections are easily available for further research and can be examined frequently without loss of information.

3.5.9 It is recommended that all material be retained at this stage, in order to be incorporated into any analysis and publication aspect of the project.

3.6 Archive Index

Table 3: Archive ARC 330 98 Zone 4

Item	**Number Of Items or boxes or other**	**No of Fragments or litres or weight**	**Condition (No. of items)** (W=washed; UW=unwashed; M=marked; P=processed; UP=unprocessed; D=digitised; I=indexed)
ARC 330 98 – ZONE 4			
Contexts records	739		I
A4 plans	265		I, D
A4 sections	192		I, D
Small finds	1 box size 1	20	W, M, P, I
Films (monochrome) S=slide; PR=print	463pr		P, I
Films (Colour) S=slide; PR=print	S=463		P, I
Lithics (boxes)	2 size 1	247	W, I
Burnt flint (boxes	2 size 1	35.96kg	W,I
Pottery (boxes)	15 size 1	2444	W, M, I
Fired clay (boxes)	1 size 1	1.42kg	W, I
CBM (boxes)	5 size 1		W
Stone (boxes)	1 size 1		W
Animal Bone (boxes)	5 size 1	790	W, I
Molluscs	1 size 2	97	P, I
Flora	1 size 1		P, I
Flots	1 size 1		P, I
Soil Samples (10lit. buckets)	330		P – 100%
Soil Samples (no. of contexts)	149		

Quantification of Finds by volume (ARC 330 98 – Zone 4)

Description	**Capacity**	**No.**	**Total Volume**
Shoe box (size 1)	$0.0108m^3$	34	$0.3672m^3$
Skeleton box (size 2)	$0.0311m^3$	1	$0.0311m^3$
Total			$0.3983m^3$

Table 4: Archive ARC TLG 98

Item	**Number Of Items or boxes or other**	**No of Fragments or litres or weight**	**Condition (No. of items)** (W=washed; UW=unwashed; M=marked; P=processed; UP=unprocessed; D=digitised; I=indexed)
Tollgate ARC TLG 98			
Contexts records	9		I
A4 sections	3		I, D
Lithics (boxes)	See misc.	3	W, I
Burnt flint (boxes)	See misc.	30g	W, I
Fired clay (boxes)			W, I
CBM (boxes)			W
Molluscs	See ARC 330 98 Zone 4	24	P, I
Misc.	1 size 1		P
Soil Samples (10lit. buckets)	29		P – 100%
Soil Samples (no. of contexts)	0		All bulk samples (310 litres) were sterile and have been discarded.
Soil Samples (Monolith/kubiena tin)	4		P, I

Quantification of Finds by volume (ARC TLG 98)

Description	**Capacity**	**No.**	**Total Volume**
Shoe box (size 1)	$0.0108m^3$	1	$0.0108m^3$

Table 5: Archive ARC CRS 98

Item	**Number Of Items or boxes or other**	**No of Fragments or litres or weight**	**Condition (No. of items)** (W=washed; UW=unwashed; M=marked; P=processed; UP=unprocessed; D=digitised; I=indexed)
ARC CRS 98			
Contexts records	28		I
A4 plans	8		I
Lithics (boxes)	See misc.	2	W, I
Pottery (boxes)	See misc.	13	W, M, I
Fired clay (boxes)	See misc.	0.25kg	W, I
CBM (boxes)	See misc.	0.03kg	W
Misc.	1 size 1		W, I

Quantification of Finds by volume (ARC CRS 98)

Description	**Capacity**	**No.**	**Total Volume**
Shoe box (size 1)	$0.0108m^3$	1	$0.0108m^3$

4. STATEMENT OF POTENTIAL

4.1 Stratigraphy

4.1.1 The contexts recorded on the site have already been amalgamated to both subgroup and groups – according to standard MoLAS procedure. These groups have also been placed into land-use entities and periods. The stratigraphic analysis will amalgamate the relevant sections of the specialist reports to form an integrated text.

4.1.2 The stratigraphic evidence has the potential to contribute in varying degrees towards the following Time Periods:

- Early Agriculturalists (4500-2000 BC)
- Farming Communities (2000-100 BC)
- Towns and their rural landscapes (100 BC - AD 1700)

4.1.3 Within these time periods the stratigraphy can contribute towards the following Research Objectives or Landscape Zone Priorities:

Early Agriculturalists (4500 – 2000BC)

- *Define the nature of the contemporary environment*

4.1.4 There is limited potential for the stratigraphy to answer this objective.

- *Determine the nature and effect of clearance for agricultural activity*

4.1.5 If the Mortuary enclosure and the possible Church Road megalithic monument are contemporary, this indicates that a significant amount of land must have been cleared by/at the end of the Neolithic. The area of Singlewell shows evidence for a subsequent build up of colluvial deposits and indications that the area was often waterlogged and subject to flooding (heathland). The agricultural soils at Tollgate were very thin and shallow, but became thicker towards Singlewell.

- *Define the ritual and economic landscapes and their relationships*

4.1.6 No evidence for the economic landscape has been found. The ritual remains include the double Beaker burial at ARC WNB 98 Area C (Area 330 Zone 3 – although no above ground structures were found here), the mortuary enclosure at Tollgate and the possible Church Road megalithic monument. These give a spatial distribution for major structures and uses and help to point to a potential second Neolithic monument group for Kent, in addition to the 'Medway Megaliths'.

- Determine the nature of and changes in economic lifeways eg relative importance of hunting-foraging and agriculture, studied especially through the recovery of faunal and charred plant remains

4.1.7 There is limited potential for the stratigraphy to answer this objective.

Farming communities (2000-100BC)

- *Determine spatial organisation of the landscape in terms of settlement location in relation to fields, pasture, woodland, enclosed areas and ways of moving between these*

4.1.8 The nature of the linear cut through the landscape will only give a representative sample of the actual nature of land use - any gaps in the sequence may simply be due to activity not being affected by the CTRL works. The results from Zone 4 show a shifting pattern of continuous settlement from the Late Neolithic/Early Bronze Age through to the late Iron Age. Foci change with time and clear patterns are visible.

4.1.9 Settlement is concentrated on the land between the Tollgate mortuary enclosure and Church Road, Singlewell. The discovery of rubbish pits and possible timber huts demonstrates occupation commencing in the Late Bronze Age-Early Iron Age and continuing into the mid-late Iron Age. The length of occupation and limited remains may indicate that this site was seasonally occupied. The soils in the Tollgate area are thin and stony and it may be that the land was used for summer grazing/pasture.

4.1.10 At Henhurst Road a large 'artesian well' was recorded which contained significant amount of Late Bronze Age pottery and a number of perforated clay slabs. These finds would usually indicate settlement in the immediate vicinity. The 'well' is part of a series of later, Roman, wells in the area of 'Singlewell'.

4.1.11 The Church Road sarsen area included a very large saddle quern. This indicates that these lighter and deeper soils (derived from colluvial material creeping down from Scalers Hill) were considered suitable for arable agriculture. The location of the saddle quern indicates an area of crop processing, adjacent to the possible Neolithic monument and at the western limit of the colluvial soils. The remains of Roman period lava quern fragments nearby probably indicate continuity of land use into the 1st century AD.

- *Consider environmental change resulting from landscape organisation and re-organisation*

4.1.12 Evidence from the colluvial deposits at the base of Scalers Hill shows that a significant movement of material has occurred since the end of the Iron Age. It is likely that this movement commenced during the Bronze Age and the clearance of the woodland and landscape organisation. The result initially increased the fertility of the Singlewell area and allowed for arable agriculture. However the increased colluvial deposition has since turned the area of Singlewell into a poorly drained 'heathland'.

4.1.13 The area of Tollgate is characterised by thin topsoil over clay and flints head or chalk. It seems that, once this area was cleared of woodland, a process of erosion/agriculture ensured that soils slipped downslope towards the A227 until it may have been necessary to turn the area to pasture.

- *Determine how settlements were arranged and functioned over time*

4.1.14 The prehistoric settlement between Tollgate and Church Road could have been occupied virtually continuously, or at least seasonally, from the Late Bronze Age to the Late Iron Age. No other concentration of settlement was found elsewhere within Zone 4. The function of this settlement is agricultural, perhaps connected with the arable cultivation of the fertile soils of Singlewell and/or the possible grazing areas of Tollgate.

Towns and their rural landscapes (100 BC - AD 1700)

- *What was the effect of the development of towns (eg London, Springhead) on the organisation of the landscape?*

4.1.15 Occupation and agricultural activities continue smoothly from the Bronze Age through to the late 1st century AD; then there is a break. Almost no evidence occurs for the 2nd to 4th century AD Roman occupation in Area 330, Zone 4. It is likely that this break is associated with the controlling influences of the Roman administration and development of towns giving a general (possibly enforced) decrease in the rural population. The rural areas then operate as parts of villa estates and remain unoccupied.

- *Did population increase and concentration effect natural resource exploitation and accelerate environmental change?*

4.1.16 The Zone contains numerous prehistoric and Roman artesian wells and medieval/post-medieval chalk mines but these resource exploitations do not seem to have produced environmental change.

4.1.17 The main change comes from the probable further clearance of woodland from the slopes of Scalers Hill, producing a significant creep of material onto the Singlewell area, sealing the Roman dated features. This material, being derived form the Thanet Sands, drains very poorly and has helped turn this area into a form of heathland, difficult to cultivate without drainage and mechanical help.

- *How were settlements and rural landscapes organised and how did they function?*
- *How did the organisation of the landscape change through time?*
- *Consider the effect on the landscape of known historical events, e.g. the arrival of Roman administration.*

4.1.18 The prehistoric occupation site at Tollgate was undefended and agricultural in form. Use of the site appears to have continued until the 1st century AD.

4.1.19 The landscape during the mid 1st century AD, the landscape appears to have been basically organised as it was during the prehistoric period. The main addition was the Henhurst Road road, potentially the first phase of Watling Street, which imposed a linear marker during the 1st century AD, on whose orientation numerous linear field boundary/drainage ditches were aligned. The road, while clearly an effect of the arrival of the Romans, may have had its origins in the pre-Roman Iron Age. This is because the road may have skirted round the lower, southern levels of Scalers Hill (as opposed to crossing the top of it as the later Watling Street is thought to do), and quickly deteriorates into a single track hollow way.

4.1.20 It is possible that Henhurst Road itself is also of Roman origin as it marks the boundary of slight changes in alignments from the features to the east and to the west. The presence of numerous artesian wells at this 'junction' attests to the area being perhaps used as a watering halt. This area mostly goes out of use by the end of the 1st century AD but one well to the east of Henhurst Road continues in use to the 2nd/3rd century AD.

4.1.21 No field boundaries of 2nd century AD onwards were recorded. It seems likely that the area formed part of a series of estates where these boundaries were not necessary – the limits probably being formed by the transverse pre-cursors of Wrotham Road, Church Road and Henhurst Road (and possibly Scotland Lane to the east Area 330 Zone 5). The lack of drainage ditches may indicate that the area

was used for pasture as a poorly drained heathland had probably developed by this time.

4.1.22 The evidence seems to suggest that the rural population in Zone 4 decreased at the end of the 1st century AD with an apparent clearance and organisation of the landscape by the Romans. Very little evidence remains for the Later Roman and Early Medieval populations throughout the Zone (although evidence for Anglo-Saxon occupation and burial occurs to the north of the A2 at Singlewell, URL 1994).

4.1.23 New rural occupations occur at regular spatial intervals in the post-Norman conquest period. Evidence for Late Medieval and early post-medieval land use is also very limited. It is likely that the local farms were established during the later medieval period and these have altered little in position and function since that time. The only evidence for their presence comes from chalk mining (for marling the poorly drained fields of Singlewell and perhaps for slaking lime).

4.2 Landscape Zone Priorities

4.2.1 In light of the above the following Landscape Zone Priorities were identified:

Reconstruction of the changing palaeo-environment for all time periods present, through 'on-site' and 'off-site' studies, and the interaction with past economies.

- *The interaction of hunter-foragers with the natural environment*
- *Changes arising from the adoption of agricultural based economies*
- *The effects of 'urban' growth and the adoption of Roman ways and organisation in general*
- *The effects of and extent of clearance of the 'Wealden Wild Wood'*
- *Changes arising from early industrial economies*

4.2.2 The stratigraphy in Zone 4 has a limited potential to answer these Landscape Priorities. The main aspect seems to be the large scale slip of material from the high ground of Scalers Hill onto Singlewell, resulting from the clearance of woodland and possible agricultural practices from the prehistoric period onwards. The main build up seems to have been since the 1st century AD (currently forming a colluvial deposit between 0.60m and 1.20m deep near Henhurst Road).

Spatial organisation of the landscape, and changes through time

- *The socio-economic landscape of later agriculturists (2,000-100 BC)*
- *The immediate pre-Roman - early Roman urban-rural landscape*

4.2.3 Zone 4 shows a mix of prehistoric settlement and presumed agricultural activity. The (perhaps seasonal) settlement occurs to the east of the Tollgate mortuary enclosure. The saddle quern at the Church Road sarsens may have continued in use until the Iron Age and adjacent lava quern fragments found with Roman pottery indicate that the area was used for crop processing, and therefore crop production, during the prehistoric period until the 1st century AD.

- *The effect of the Roman administration on the established economic landscape*

4.2.4 The evidence seems to suggest that the rural population in Zone 4 decreased at the end of the 1st century AD with an apparent clearance and organisation of the landscape by the Romans.

- *The impact and effect of the development of Roman Watling Street*

4.2.5 To the east of Henhurst Road is a possible prehistoric trackway, orientated from south to north. This is cut by an east to west gravel road, which soon goes out of use and is replaced with a north to south droveway.

4.2.6 The gravel road suffered from erosion and formed a hollow way and it is possible that the road did not originally cross the top of Scalers Hill but skirted the southern slopes near to Cobham Hall. During major changes at the end of the 1st century AD it was probably up-graded and moved to a better location *c* 360m to the north (the area of the present A2).

4.2.7 If the gravel road recorded at Singlewell is the original Watling Street it is clear that it was not constructed on a grand scale but was basically a 'single cart' width. Such a width is often seen in hollow ways/early roads, and was also seen in the medieval/post-medieval Watling Street to the east at Cobham Golf Course (Area 330 Zone5). Also, if this road is Watling Street, it shows that this 'main arterial road' was probably not constructed until between AD 70 and 100. Before this, the Romans were content to throw up narrow roads, possibly even re-using Late Iron Age routes, until the land and budgets were fully available for accurate survey and large scale construction. The presence of the Bronze Age well at Henhurst Road may also indicate that this road had its origins in that period.

4.2.8 A small number of linear field boundaries are located in the area of the Henhurst Road road but these only contain 1st century AD material. It is noteworthy that there were no field boundaries later than the 1st century AD were located. This may imply that, with the construction of the main Watling Street, the landscape was re-organised and cleared, so that boundaries were not really necessary; the north to south roads forming divisions between villa estates or farms.

4.2.9 Indicators of alignment, and the north to south droveway at Henhurst Road, may show that the modern Henhurst Road and possibly Church Road have their origins as side roads from Watling Street. The area around Henhurst Road may have acted as a watering halt, utilising numerous artesian wells.

- *Character, function and development of the rural urban fringe, and satellite uses*

4.2.10 Zone 4 appears to have been a fully rural, agricultural area, crossed by routeways.

The late and immediate post-Roman landscape

- *The decline of the urban economy and wider changes in the later Roman economy in general - how this is reflected in the archaeological resource, and its effect on rural settlement and economy*

4.2.11 No evidence for the late and immediate post-Roman landscape was recovered. It may be that much of the population left the undefended rural sites during the disturbances of the 3rd century AD and did not return for settlement after that. The land may have continued to be worked, but perhaps only those areas with easy access from the towns/villages.

Ritual and ceremonial use of the landscape

- *The environment of the Neolithic long barrow-mortuary enclosure at Tollgate*

4.2.12 The ritual remains include the double Beaker burial at ARC WNB 98 Area C (Area 330 Zone 3 – although no above ground structures were found here), the mortuary enclosure at Tollgate and the possible Church Road megalithic

monument. These give a spatial distribution in a cleared landscape for major structures and uses, and help to point to a second Neolithic monument group for Kent, in addition to the 'Medway Megaliths'.

4.2.13 The environment may be determined from subsequent pollen analysis from the ARC TLG 98 samples.

4.3 Fieldwork Event Aims

4.3.1 The Fieldwork Event Aims for the watching brief (ARC 330 98) Zone 4 were as follows:

East of Chainage 41+460 to 42+000
Primary aims

- *to record changes in landscape division present within the site*
- *determine the form, function and chronology of occupation*
- *determine the spatial arrangement of occupation.*

4.3.2 This area was used for occupation from the Late Bronze Age to the Late Iron Age. Land division may be characterised be a series of linear ditches, which may radiate out from the occupation area. These may have formed a series of very local boundaries during the Late Iron Age – Early Roman period.

Church Road to Scalers Hill Chainage 42+000 – 43+780
Primary aims

- *To record changes in landscape division present within the site*
- *to establish the date and sequence of landscape division*
- *to establish changes in the local environment through the recovery of suitable palaeo-environmental samples from the fill of cut features*
- *determine the spatial arrangement of occupation present within the area of investigation.*

4.3.3 During the Late Bronze Age a well was used at Henhurst Road. This well contained perforated slabs, usually associated with occupation sites.

4.3.4 During the 1st century AD an east to west road and drainage/boundary ditches were established to at Henhurst Road. After the 1st century AD there is no evidence for land division and the road goes out of use. It is likely that the land was divided by Wrotham Road, Church Road and Henhurst Road, much as it was until recently.

4.4 Artefacts

Ceramics: Prehistoric and Roman pottery

4.4.1 The prehistoric pottery assemblage has good potential to contribute to the following Landscape Zone Priorities:

Farming communities (2000-100 BC)

- *Determine spatial organisation of the landscape in terms of settlement location in relation to fields, pasture, woodland, enclosed areas and ways of moving between these.*
- *Determine how settlements were arranged and functioned over time.*

4.4.2 The pottery will contribute greatly to the construction of a chronological framework within which the spatial organisation of the landscape and its development can be examined. Zone 4 is particularly important for the movement

of both settlement and agricultural/pastoral activity across the landscape over time. In particular the prehistoric material is important for the Late Bronze Age/early Iron Age transition period.

4.4.3 The late prehistoric and Roman pottery assemblages have good potential to contribute towards the following Research Objectives:

Towns and their rural landscapes (100BC - 1700 AD)

- *How were settlements and rural landscapes organised and how did they function?*
- *How did the organisation of the landscape change through time?*
- *Consider the effect on the landscape of known historical event, eg the arrival of Roman administration.*

4.4.4 The pottery assemblage will contribute to the characterisation of activity of this period and chronology of change.

4.4.5 Examination of the assemblage in terms of composition, percentage of imported wares and non-local wares will contribute to the study of the effects of the Roman conquest and levels of Romanisation.

4.4.6 The prehistoric and Roman pottery assemblages have good potential to contribute to the following Fieldwork Event Primary Aims:

- *To establish a record of changing settlement and landscape morphology for the area.*

4.4.7 The pottery provides a good chronological framework for examining the changing settlement and landscape morphology. Through more detailed examination of the assemblage and comparative analysis with other assemblages, the chronology of each phase could be refined.

- *To determine the function of these areas and changes through time.*

4.4.8 The pottery has the potential to contribute to the characterisation of each area. The assessment has not highlighted any groups that are particularly functionally distinct.

4.4.9 The post-Roman pottery assemblage will contribute towards the following Research Objectives:

Towns and their rural landscapes (100 BC - AD 1700)

- *How were settlements and rural landscapes organised and how did they function?*

4.4.10 Comparison of the assemblage with others in the area may help understand patterns of trade. The relative proportions of different wares and forms are consistent with rural domestic sites.

Ceramics: Fired clay

4.4.11 The fired clay (daub) has the potential to provide information for the following Research Objectives:

Farming communities (2,000-100 BC)
The Recent Landscape (1700-1945)

- *Determine spatial organisation of the landscape in terms of settlement location in relation to fields, pasture, woodland, enclosed areas and ways of moving between these.*
- *Determine how settlements were arranged and functioned over time.*

4.4.12 The daub assemblage from ARC 330 98 can be shown to be of prehistoric date and therefore has potential to provide information on the location and form of structures the Late Bronze Age to Late Iron Age settlement at Church Road, Singlewell.

4.4.13 The fired clay (daub) has the potential to provide information for the following Fieldwork Event Aims:

- *To establish a record of changing settlement and landscape morphology for the area, to include habitation areas and associated enclosures.*
- *To determine the function of these areas and changes through time.*

4.4.14 If the daub/fired clay from ARC 330 98 represents, as seems likely, the remains of structures from the Late Bronze Age to Late Iron Age, its analysis has the potential to provide information on land use and environment.

4.4.15 The tile has the potential to provide information for the following Fieldwork Event Aim:

- *To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established.*

4.4.16 The roofing tile provides evidence for the type of roof covering used on building in the area during the post-medieval period, whilst the wall tile gives an indication as to the types of internal decoration employed.

Lithics: Worked and Burnt Flint

4.4.17 The flint assemblage is largely redeposited with a small amount from a limited number of contexts but can contribute to the research objectives of the project following the fieldwork event aims and the Landscape Zone aims:

Farming communities (2,000-100BC)

- *Determine the ritual and ceremonial use of the landscape.*

4.4.18 The flint could provide evidence for the activities occurring through the Neolithic and Bronze Age, but the small quantities could limit the analysis. This indicates sparse activity, although they become more significant in light of the presence of the possible megalithic monument to the east of Church Road and the mortuary enclosure at Tollgate. These monuments may have provided a ritual background for the flints.

Humanly modified and unworked stone

4.4.19 The stone artefacts can assist the following Fieldwork Event Aims:

- *To establish the socio-economic landscape morphology for the area*
- *To determine the function of these areas and changes through time*

4.4.20 The stone artefacts provide further evidence for human occupation and activity in the area. Their exact dating is, at present, unclear. With further integration of the accessioned finds, the stratigraphy and the pottery dating that their place within the context of the site and the processes going on there, will become clearer.

4.4.21 The hones and querns have the potential to inform about domestic activity in the area and also trade routes (stone querns and other artefacts were often traded over long distances).

Metalwork: Coins

4.4.22 The coins have little potential, as it is not thought that they can be of use to either the landscape Zone Priorities or the Fieldwork Event Aims.

Metalwork: Artefacts

4.4.23 The metalwork from ARC 330 98 can aid the following Landscape Zone Priority:

- *Spatial organisation of the landscape and changes through time.*
- *The socio-economic landscape of the later agriculturalists (2,000, 100 BC).*

4.4.24 The recovery of the La Tène brooch, dating broadly to the 3rd century BC is of interest. Comparison should be made with the other sites in this zone to identify other Iron Age material to build up a picture of how the landscape was being used in this period.

4.4.25 The metalwork from ARC 330 98 may assist the following Fieldwork Event Aims:

- *To determine the spatial organisation of the landscape, and changes through time.*

4.4.26 The majority of the accessioned finds (as outlined above) have little to add to this aim. The Iron Age brooch is, however, of interest and may be able to aid the interpretation of the function and settlement of the area at this time.

- *To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established.*

4.4.27 Some of the metal work found is probably associated with other fittings and as such is difficult to date or to interpret without other datable material recovered from the same contexts. The Iron Age La Tène brooch is of interest since it is in quite good condition, and may be of use in building up a chronology of activity in the wider area.

- *To determine the character, function and development of the rural Roman fringe.*

4.4.28 The Roman finds may be of use in interpreting the uses to which the site was put to during this period and the sort of population that was using it. A possible arrowhead was identified and should be analysed and compared with surrounding sites.

Glass

4.4.29 The glass has little potential, as it is not thought that the assemblage can be of use to either the Landscape Zone Priorities or the Fieldwork Event Aims. However, it would be of interest to see if the general lack of Roman glass is unusual and if it can indicate anything about the uses that this area was being put to in that period. The glass bead is basically unstratified but is almost certainly post-medieval in date; it has little potential for helping in the interpretation of the site.

Ceramics: Artefacts

4.4.30 The perforated slabs can assist the following Research Objective:

Farming Communities (2000-100 BC)

- *Determine how settlements were arranged and functioned over time*

4.4.31 The perforated slabs supply further evidence for human settlement in the area in the prehistoric period. Their function is unknown but have been found elsewhere in Bronze Age contexts**,** for example at Cobham Golf Course (Area 330 Zone 5), Monkton Court Farm, Isle of Thanet (Perkins 1995, 311-12), and the North Ring, Mucking, Essex (Bond 1988, 39-40 & 50). They indicate the presence of settlement in the vicinity.

4.4.32 The slabs from ARC 330 98 can assist the following Landscape Zone Priority:

Spatial organisation of the landscape, and changes through time
- *The socio-economic landscape of later agriculturists (2000-100 BC).*

4.4.33 The presence of the slabs is indicative of a Bronze Age settlement in the vicinity, as well as possible Bronze Age activity.

4.4.34 The slabs from ARC 330 98 can assist the following Fieldwork Event Aim:

- *To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established*

4.4.35 The slabs are of a type that have been found in Bronze Age contexts and adds to the corpus of artefacts found elsewhere. They will require further work on their identification.

4.5 Environmental

Environmental: Worked Bone

4.5.1 The antler finds from ARC 330 98 can assist the following Landscape Zone Priority:

Spatial organisation of the landscape, and changes through time
- *The socio-economic landscape of later agriculturists (2,000-100 BC).*

4.5.2 The finds indicate antler working in the vicinity pointing to a diversity of activity by the community in the later prehistoric period.

4.5.3 The antler from ARC 330 98 can assist the following Fieldwork Event Aim:

- *To determine the form, function and chronology of occupation*

4.5.4 The antler finds indicate localised activity. The form of the handle may indicate what type of implement it was used for and both objects may indicate the types of implements used by them.

Environmental: Animal Bone

4.5.5 The has the potential to provide information for the following Fieldwork Event Aims:

- *To establish changes in the local environment through the recovery of suitable palaeo-environmental samples from the fills of cut features.*
- *To investigate patterns of natural resource exploitation through the recovery of economic indicators such as faunal and charred plant remains.*

4.5.6 Changes in local environment may be detected from the bone assemblage, as shown by the percentage of the major domesticate species in comparison to their pasturage requirements.

4.5.7 The animals exploited included the major domesticates – cattle, sheep/goat and pig, and also, in the medieval period, a small collection of wild species including roe deer and some fish. It is clear that the major part of the meat requirements were met by the domestic species. The proportion of sheep/goat bones tends to outnumber those from the other two domesticates, which is perhaps indicative of a meat preference (although see 4.5.6).

Mollusca

4.5.8 The assemblage has generally little potential for further study in terms of quantification of species, or of ecological interpretation. Identification of all species will allow some comment on the general nature of the local environment, mainly at ARC 33098.

Macroscopic plant remains and charcoal

4.5.9 The plant remains and charcoal have the potential to provide information for the following Fieldwork Event Aims:

- *To determine the palaeo-economy of settlement through the recovery of charred plant material and other palaeo-economic indicators*

4.5.10 Few plant remains were recovered from the Bronze Age and Iron Age samples, so their value is limited. Very little material of this date, and from this area of Kent, has been previously studied however, and analysis of the 21 samples will improve our knowledge of cereal use and cultivation in these periods. Identification of the charcoal samples will give an idea of the wood species being exploited.

4.5.11 Samples from Roman pitfills will provide information about cereal processing, husbandry and the environmental conditions of the fields. The charred wood fragments were too small to reveal information about woodland management but their identification will help to determine the species of wood used as fuel.

4.5.12 Charred plant remains, including grain from the medieval pitfills will reveal information about crop husbandry, processing and the environmental conditions in the fields.

Geo-archaeology

4.5.13 The data from the monolith samples has potential to address the following Landscape Zone and Fieldwork Event Aim:

- *To study the natural landscape, its geomorphology, vegetation and climate, as the context within which the archaeological evidence can be interpreted.*
- *Farming communities (2000 BC-100 BC): to consider environmental change resulting from landscape organisation and re-organisation.*

4.5.14 Monolith samples were taken through a sequence of colluvial deposits at Tollgate (ARC TLG 98) midway down the dry valley at the western end of Zone 4. Pollen analysis and soil micromorphology should provide information about the changing climate, vegetation and landscape.

4.5.15 The main potential of the samples will be to provide information about the late glacial environment. Examination of soil micromorphological thin sections would enable the characteristics of the possible arctic soil identified in the monolith tins to be established. This analysis should also be able to reconstruct the sequence of events that pre-dated the accumulation of Coombe Rock, thus contributing to a better understanding of the late glacial period in this area. Pollen is likely to be preserved in these fine-grained sediments. Its analysis has the potential to reconstruct the changing late glacial vegetation and thus provide supporting evidence for the changing climate and landscape implied by soil micromorphology. This analysis cannot be absolutely dated. However it is important to establish the sequence of events that took place during the late glacial period, even though the precise timing and duration of these events will not be known. As the dramatic climatic oscillations that took place at this time are

likely to be identifiable in the pollen and micro-stratigraphic record, they should be recorded, as this will enable the chain of events to be compared to what is known from dated sequences elsewhere.

4.5.16 The data from the samples taken through Holocene colluvium has some potential to address the following Fieldwork Event Aim:

- *To determine the function of these areas and changes through time*

4.5.17 By comparison to Godwin's pollen zones, pollen analysis could be used as a relative dating guide. This should enable the sequence of landscape events and changing environment, which could potentially be inferred from thin section and pollen analysis, to be compared to similar information from Northumberland Bottom, slightly down valley from the present site. Such analysis has potential to provide information about the interaction between local human activities and environmental change for the prehistoric period.

4.6 Statement of overall potential

4.6.1 The principal site data has the potential to contribute towards the following Time Periods as defined in the CTRL Archaeology Research Strategy

- Hunter foragers (4000,000 – 4500BC)
- Early Agriculturists (4500-2000 BC)
- Farming Communities (2000-100 BC)
- Towns and their rural landscapes (100 BC - AD 1700)

4.6.2 Within these Time Periods the data can be used to address the following Research Objectives and Landscape Zone Priorities

Hunter foragers (400,000 – 4500BC)

4.6.3 The discovery of the Palaeolithic biface (hand axe) and the sequence of late glacial deposits below soliflucted chalk in the Wrotham Road dry valley (ARC TLG 98) has potential for the recovery of significant data from the Pleistocene and early Holocene.

4.6.4 The hand-axe found at ARC TGS 97 came from a soliflucted deposit, but was in fresh condition, which suggested it had not been transported far. The deposit was at 60.30m OD, considerably further upslope than the present soliflucted deposits. Whilst this does not necessarily mean they could not have been deposited at the same time, the soliflucted material at ARC TGS 97 was reported to have come from the north-west of the ARC TGS 97 site - an area that is today a dry valley. This implies that the soliflucted deposit in which the handaxe was found accumulated prior to the incision of the dry valley system. Its deposition was likely to have been between 25-14ka BP (URL 1997).

4.6.5 Although there is no direct dating evidence for the deposits below the soliflucted chalk at ARC TLG 98, it would be valuable to compare its pollen profile with that from Area 330 Zone 3 (ARC TGW 97). Using pollen as a rough dating guide this should be able to provide more information on sediment deposition episodes, the environment within which they occurred and the stability within the valley catchment. This will enable inferences to be made regarding the possible involvement of human activities in local landscape change.

Early Agriculturists (4,500-2,000 BC)

4.6.6 The potential megalithic monument is a comparatively rare example and is therefore of great significance. The majority of the early finds from this area (particularly Area 330 Zones 3 and 5) are all Late Neolithic to Early Bronze Age (c 2,500 – 1,600 BC), so it is likely that these potential megalithic structures are from this date, rather than true 'Neolithic' forms.

4.6.7 The group needs to be considered in relation to the possible Neolithic mortuary enclosure at nearby Tollgate, the Beaker burials at Northumberland Bottom (ARC WNB 98), and the barrows at Whitehill Road (ARC WHR 99) and Cobham (ARC CGC 98). It should also be noted that most of the finds in the area, which include the Ebbsfleet Valley, the Nashenden Valley (A2M2 Junctions 1 to 4 Road Widening Scheme, MoLAS in prep), White Horse Stone and Kits Coty (North Downs Escarpment) are associated with prominent positions on valley or hillsides. The Singlewell group occurs in the centre of a large, flat plain. It is in a

similar position to Stonehenge on Salisbury Plain and may have formed a complex of major ritual significance.

4.6.8 A relatively large, affluent and organised population would have been needed to bring in the sarsens (from at least 11km from the opposite side of the Medway Valley) and construct this site.

Farming Communities (2,000-100 BC)

4.6.9 Late Bronze Age occupation is seen at Henhurst Road, with the recovery of pottery and perforated clay slabs being recovered from a large 'well'. Perforated clay slabs were also recovered from the Late Bronze Age occupation site at Cobham Golf Course (Area 330 Zone 5, ARC CGC 98). The large well at Henhurst road may indicate the location of a Bronze Age routeway, as subsequent roads (see below) in the area are closely associated with wells, as if this was a good watering place.

4.6.10 A Late Bronze Age to Late Iron Age settlement site was located to the east of the Tollgate mortuary enclosure, with occupation spanning the period from the Late Bronze Age to the late Iron Age. Similar settlements with equally long periods of occupation occur at Cuxton (Area 330 Zone 6, ARC CXT 98) and Hazells Farm (Area 330 Zone 3 ARC 330 98). Consideration should be given as to whether these sites went through phases of permanent occupation and abandonment, or whether they were used on seasonal basis for a very long period of time.

4.6.11 Evidence from the saddle quern at the Church Road sarsens shows evidence for crop processing. This could infer arable land use at Singlewell, based on the colluvial soils creeping down from Scalers Hill. A lack of field boundaries in the Tollgate area may represent a more pastoral land use (the area is still used for horse rearing today). These land uses continued until the end of the 1st century AD.

4.6.12 Analysis of the pottery and other categories of finds will contribute to the construction of a chronological framework within which the spatial organisation of the prehistoric landscape and its development through time can be examined.

4.6.13 Analysis of the mollusca, non-domestic animal bones and soil samples will contribute to an understanding of the contemporary environment and any local variations that might have existed.

4.6.14 Certain categories of finds, such as pottery, stone artefacts and loom weights will provide information on the nature of settlement and the types of activities involved, and analysis of the domestic animal bones can contribute to the study of the local economy.

Towns and their rural landscapes (100 BC - AD 1700)

4.6.15 The prehistoric occupation site at Tollgate was undefended and agricultural in form. Use of the site appears to have continued until the 1st century AD. Zone 4 can contribute to the understanding of how the continuity from the Bronze Age was interrupted by the Roman organisation of the landscape in the late 1st century AD.

4.6.16 The landscape during the 1st century AD appears to have been basically organised as it was during the prehistoric period. The main additions were the road and field system grid at Singlewell which clearly represent an effect of the arrival of the Romans. It is likely that the road recorded to the east and west of Henhurst road

(preserved *in situ* to the west) is the first phase of Roman Watling Street. This is of major significance as it reflects the original scale, position, use, maintenance and limits to the Roman road between *c* AD 45 and *c* AD 70. Further work on the finds may be able to refine the construction dates. It should be noted that, although the gravel road appears narrow, it is no more narrow than the medieval/post-medieval 'Watling Street' which, until recently, sat in a hollow way adjacent to Cobham Golf Course.

4.6.17 The possible original course of this road should also be discussed; clearly it would have been easier to build a road on the lower slopes to the south of Scalers Hill, rather than construct straight over the top, as the 'later' Watling Street. Does this mean that the gravel road as found represents the Romans re-using a pre-Roman Iron Age routeway? Was this Iron Age route based on any earlier Bronze Age communication corridor?

4.6.18 The main Watling Street construction, on the route defined by Margary, may then date to between AD 70 and 100. This coincides with the date for the apparent 'clearance' of many of the previously existing settlement sites in the Gravesend area. It is possible that, in this 'post-Boudiccan revolt' environment that the Romans sought to fully establish their authority on the landscape at this time. This authority may have involved the establishment of Watling Street and a series of villas and farm estates bordering the road (which would have helped to ensure the security of the road). Comparison with other Roman settlements such as found at Singlewell, to the north of the modern A2, may help to refine the chronology.

4.6.19 The Henhurst Road road has great potential for comparative studies to other Roman roads found along the CTRL (ARC NBR 98, ARC HRD 99, ARC WNB 98, ARC NEW 97).

4.6.20 No field boundaries of 2nd century AD onwards were recorded. It seems likely that the area formed part of a series of large organised estates where these boundaries were perhaps not necessary – the limits probably being formed by the transverse Wrotham Road, Church Road and Henhurst Road (and possibly Scotland Lane to the east Area 330 Zone 5). There is potential for further research into the origins and spatial distribution of these roads. It should be noted that all the main roads from New Barn Road to Scotland Lane are roughly 1.2km or 1.3km apart, with the exception of Church Road/Henhurst Road, which are approximately 850m apart.

4.6.21 The evidence seems to suggest that the rural population in Zone 4 decreased at the end of the 1st century AD with an apparent clearance and organisation of the landscape by the Romans. Very little evidence remains for the Later Roman and Early Medieval populations throughout the Zone. This pattern is reflected in Area 330 Zones 2 and 3.

4.6.22 New, broadly contemporary (11th to 13th century), rural occupations occur at regular spatial intervals in the post-Norman conquest period. These are often in similar locations to the earlier Roman positions as seen in the patterns of Hazells Farm and Northumberland Bottom (Area 330 Zone 3) and the Roman villa/Cobham Hall (Area 330 Zone 5) locations. There is potential for the understanding of how the people from the Norman invaders tried to establish their dominance of the landscape in a similar way to the way the Romans had done before. This could be achieved by further analysis of site location, landscape priorities (land, water, fuel etc), stratigraphic details and pottery. The pottery may

highlight differences between indigenous and imported wares and comparisons with assemblages from other sites in Kent, in order to determine both the chronology and spatial patterns of settlement across the landscape.

4.6.23 Evidence for Late Medieval and early post-medieval land use is also very limited. It is likely that the local farms were established during the later medieval period and these have altered little in position and function since that time. The only evidence for their presence during the works came from chalk mining (for marling the poorly drained fields of Singlewell and perhaps for slaking lime).

4.6.24 The artefactual evidence has the potential to contribute to the dating and characterisation of all of these occupation sites. The pottery is seen as particularly significant for addressing questions relating to the late Iron Age-early Roman transition, the effects of the Roman conquest and levels of Romanisation. The study of the domesticated animal bones and plant remains will also help to characterise the sites and might indicate changes in the local economy during the transitional period.

4.6.25 Analysis of the animal bones and plant remains can contribute towards the study of the local economy and environment in the prehistoric, Roman and medieval periods. The plant remains will help to clarify the function of the features in sampled contexts. Some of the contexts show possible cereal waste from Late Bronze Age, Roman and medieval contexts, which may indicate that some of the pits had a storage function. The animal bones can also indicate the level of local production, from the incidence of infant mortalities. There is also evidence for the trade in foodstuffs, as is shown by the presence of estuarine/shallow water fish within the medieval levels**.**

4.6.26 There are two key Landscape Zones Priorities that can be applied to the evidence from all Time Periods:

- *Spatial organisation of the landscape and changes through time*
- *Ritual and ceremonial use of the landscape*

4.6.27 A number of foci of activity have been identified and the assessment suggests that there was little continuity of settlement within those foci from one Time Period to another. This is particularly evident with the identification of a Late Bronze Age/Early Iron Age nucleus in the Church Road area, for which tangible dateable evidence was previously absent in other areas in this zone. Similarly, Roman evidence was located in the Henhurst Road area and to the east at Scalers Hill. The full integration of the stratigraphic, artefactual and environmental evidence will help to modify or refine this model and contribute to an understanding of the underlying causes for these shifting patterns of land use.

4.6.28 There is evidence for ritual and ceremonial practice, with the presence of a megalithic monument, which may have influence the siting of occupation areas. There is much scope for considering this feature in a wider context and for comparison with similar evidence from other sites in the region.

4.6.29 Although the archaeological assessment has confirmed the potential of the archive to address both detailed questions about typologies and landscapes few areas of further research which were not already apparent at the conclusion of fieldwork have been revealed.

4.6.30 The new aims are summarised below. They enhance the existing aims rather than replacing them.

- The potential megalithic monument is of great significance. An additional aim should be the inclusion of it into the corpus of other sites in the north Kent area, establishing the local environment and potential period of construction and use. Does this represent, along with other finds/sites in the area, a second megalithic group for Kent?
- It is possible that the road at Henhurst Road, Singlewell is the first phase of Watling Street, in use between *c* AD 45 and *c* AD 70. Can the original eastward and westwards extensions of this road be deduced and what was the nature of the road in relation to the other roads found in the area? Can the dating for this gravel road be refined and therefore give an indicator to the construction of the main phase of Watling Street?
- Can more detail as to the potential Bronze Age origins of the routeway of Henhurst Road be established? Did the location of this potential routeway have any influence on the Bronze Age ritual and occupation activity of Area 330 Zones 3, 4 and 5?
- Is the position of wells at cross roads such an ancient feature that their location may indicate the location of now truncated routeways? Further work should be undertaken on the nature and use of the 'artesian wells' found at Henhurst Road (also between Scalers hill – St Thomas well and Northumberland Bottom (ARC WNB 98 Area C), especially as 'well' is still mentioned in the local place name 'Singlewell'. The earliest well in zone 4 is dated mid to late bronze age and the latest to 2nd/3rdcentury AD.

5. BIBLIOGRAPHY

MoLAS, (in prep), 'A2M2 Junction 1 to 4 Road Widening Scheme; A Post-excavation Assessment'

URL [Union Railways Limited], 1994, 'Channel Tunnel Rail Link, Assessment of Historic Effects, Final Report', Oxford Archaeological Unit

URL, 1995, 'Channel Tunnel Rail Link, Assessment of Historic and Cultural Effects, Supplementary Fieldwork Report', Oxford Archaeological Unit

URL, 1996, 'Channel Tunnel Rail Link, Geophysical Surveys, Final Report', A Bartlett Associates, Oxford

URL, 1997, 'South-East of Tollgate (ARC TGS 97), an archaeological evaluation', Museum of London Archaeology Service

URL, 1997, 'West of Church Road, Singlewell (ARC CRS 97) an archaeological evaluation', Oxford Archaeological Unit

URL, 1998, 'West of Scalers Hill (ARC WSH 98), an archaeological evaluation', Oxford Archaeological Unit

URS (Union Railways (South) Limited), 1999, 'Tollgate (ARC TLG 98), Archaeological Excavation Interim Report', Museum of London Archaeology Service

URS, 1999, 'West of Church Road, Singlewell (ARC CRS 98), Archaeological Excavation Interim Report', Museum of London Archaeology Service

URS, 2000, 'Area 330 Archaeological Watching Brief Interim Report' prepared by MoLAS

URS, 2000, 'Channel Tunnel Rail Link Section 1 Archaeology: Post-excavation Assessment Instruction no. 000-RMA-RLEVC-00030-AB' prepared by RLE

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APPENDIX 1: ASSESSMENT OF PREHISTORIC AND ROMAN POTTERY

Louise Rayner

1. Introduction

1.1 The prehistoric and Roman pottery from Zone 4 was mainly recovered from the works ARC 330 98, although a few sherds were recovered from ARC CRS 98. The assemblage is predominately of prehistoric date, although a smaller quantity of Late Iron Age/Early Romano-British and Roman pottery is present. The prehistoric pottery is predominately late Bronze Age/Early Iron Age transition period in date, with flint- and flint and shell-tempered fabrics.

1.2 Although many of the assemblages are a good size, where single, fragmentary flint-tempered sherds occur, these are recorded as indeterminate later prehistoric.

1.3 The recovery and study of this material was to assist the following fieldwork event aims:

- to establish the date and sequence of landscape division
- to recover dating evidence from the features located to enable a chronology for the division of the landscape to be established
- to determine the form, function and chronology of occupation

2. Methodology

2.1 All of the sherds recovered were recorded using standard MoLSS recording methods. The material is recorded on a context-by-context basis using fabric, form and decoration as unique identifiers. The prehistoric sherds were recorded using MoLSS and Canterbury Archaeological Trust regional fabric codes. The material was quantified by count and weight and aspects of condition were also noted.

3. Quantification

3.1 From the area of ARC 330 98 the total assemblage of prehistoric and Roman material was 2345 sherds (33641g). This breaks down to 1773 sherds (26039g) of prehistoric date and 572 sherds (7602g) of Late Iron Age/Early Romano-British and Roman date. The table shows the breakdown of material by context.

3.2 Only seven sherds were recovered from the area of ARC CRS 98, which are probably later prehistoric in date.

4. Provenance

4.1 The majority of the prehistoric material was recovered from the fills of pits and where large groups occur, appears to be of Late Bronze Age/Early Iron Age transition period date (Pit Groups I-III, Figures 5, 6 and 7). The larger assemblages suggest a date of 8th to 6th century BC is most appropriate, with a high number of decorated vessels present.

4.2 The Late Bronze Age/Early Iron Age vessels have mainly flint-tempered fabrics, although flint with coarse shell also occurs. In some of the larger groups such as quarry pit assemblage [352] (Pit [372], Figure 7) both fabrics occur in quantity suggesting they have contemporary usage. Both fabric groups are used for coarse ware vessels, predominately bipartite jars with finger-impressed decoration on the shoulder and/or rim. There are also examples with fingernail impressed decoration and a single example with pinched finger impressions. Fine ware bowls, in sandy flint-tempered fabrics are also present; again normally bipartite with plain burnished surfaces although decorated examples do occur with both incised/impressed and burnished decoration recorded.

4.3 The most distinctive fine ware bowl is represented by two joining sherds which have a band of red-finished surface above the untreated lower body, which is painted with a geometric pattern in white. Similar vessels examined by Middleton have been dated to the Early Iron Age and are from east Kent (1995, 209).

4.4 Some groups contain vessels that are more typical of Late Bronze Age assemblages (such as hooked-rim jars) and it may be that these reflect earlier activity of a 10th to 8th century BC date. Conversely there are also individual vessels that are more commonly regarded as early Iron Age, such as the polychrome decorated bowl and foot-ring based bowls which may indicate activity extends into the 5th century or later. Similar vessels from east Kent have been dated 500 to 300 BC (Macpherson-Grant 1980). The question of whether these groups represent one or more ceramic phases needs detailed consideration.

4.5 A number of the pit fills produced good-sized assemblages with a range of form types present. Further examination of these will aid the characterisation and dating of this material. A number of vessels of intrinsic interest are present such as the polychrome bowl mentioned above and a rim sherd possibly from a 'horned' or spouted bowl as seen in assemblages from north France (Hurtrelle *et al* 1989).

4.6 Also present in these groups are large quantities of organic-tempered, briquetage-like material, some of which appears to have been used for vessels of the same form as those that occur in flint- and flint and shell-tempered fabrics. Due to the nature of the fabric this material is very abraded and fragmentary so it impossible to ascertain whether it all derives from vessels or whether some is indeed briquetage. Parallels need to be sought to further clarify the nature of this material.

4.7 Several of the jar bases in the Late Bronze Age/Early Iron Age groups retained carbonised organic residues, such as [389] (Pit [387, Figure 7) and [884] (Pit [871, Figure 5) which suggests use for cooking and implies associated domestic occupation. These residues may contain carbonised food or fuel and can also be sampled for radiocarbon dating. If a radiocarbon date is obtained, it will provide close dating for the associated pottery assemblage.

4.8 A single assemblage with a glauconite-rich footring bowl and grog-tempered fabric is likely to be later, dating mid/late Iron Age (Pit [508], Figure 7). This is the only occurrence of glauconite fabrics in this assemblage.

4.9 The late Iron Age/early Romano-British pottery was recovered from pits, ditches and gullies. Much of the material is comparable to pottery of this date that has been recorded from other CTRL zones from this area. The fabrics are mainly shelly, sandy and grog-tempered wares. The most common forms are bead-

rimmed jars and larger everted rimmed storage jars. There is also a small amount of 2nd century Roman pottery, including black-burnished types wares.

5. Conservation

5.1 The painted polychrome bowl would benefit from cleaning to enable the pattern to be seen more clearly.

6. Comparative material

6.1 Comparative material for the Late Bronze Age/Early Iron Age assemblage from the nearby vicinity can be found amongst the ARC CXT 98 assemblage. Further afield groups from east Kent recovered during various works associated with the A2 (Macpherson-Grant 1980) also provide some parallel material, particularly the presence of footring vessels. Aside from these, groups of this period are scarce and the addition of further pit groups from this area, in conjunction with the other material from within the CTRL project will provide important additional information for ceramics of this period.

7. Potential for further work

7.1 The pottery assemblage has good potential to address the Fieldwork Event Aims, particularly in relation to constructing a chronological framework for the activity and establishing the changes through time and function.

7.2 The assemblage is an important addition to the study of ceramics of this period from Kent and in conjunction with the other assemblages recovered from this area of the CTRL project could form part of a detailed comparative study of the variation of fabric and forms present.

7.3 The activity identified here falls within the Time period of 'Farming communities 2,000-100BC'. The sites in the North Kent plain have produced evidence for Late Bronze Age, Late Bronze Age/Early Iron Age transition period and Early Iron Age activity and as such have the potential to determine how activity is spatially organised and changes over time.

7.4 The Late Iron Age/Early Romano-British activity has some potential to contribute to examining the immediate pre-Roman and early Roman landscape.

7.5 The later Roman material is of limited potential beyond dating owing to the small size of the assemblage.

7.6 Proposed tasks:

- Define fabric descriptions for assemblage within CAT fabric type series framework.
- Radiocarbon dating of residues in [389] and [884].
- Comparative study with other Late Bronze Age, Late Bronze Age/Early Iron Age and Early Iron Age groups from region
- Prepare publication catalogue for illustrated vessels

- Prepare publication text for assemblage

8. Bibliography

Hurtrelle, J, Monchy, E, Roger, F, Rossignol, P, & Villes, A, 1989, *Les débuts du second âge du fer dans le Nord de la France*, Les Dossiers de GAUHERIA 1

Macpherson-Grant, N, 1980, 'Archaeological work along the A2: 1966-1974', *Arch Cant* xcvi, 133-83

Middleton, A P, 1995, 'Prehistoric red-finished pottery from Kent', in I Kinnes & G Varndell (eds) '*Unbaked urns of rudely shape' Essays on British and Irish pottery for Ian Longworth*, Oxbow monograph 55.

Table 6: Assessment of Prehistoric and Roman Pottery from ARC 330 98, quantifications and attributes

Context	Count	Weight	Period	Comments
32	1	2	RO	RPOT B21 BC 50-50 AD Later prehistoric/early Roman
160	52	599	RO	RPOT 50-100 Roman: 1st century AD B6 2V B9 2 R73
172	1	2	LPR	PHPOT Later prehistoric; LBA?FLIN
174	10	21	RO	RPOT 45-100 LIA/Early Roman B6
182	6	19	LPR	FLIN SCD FLIN Later prehistoric; date uncertain
190	1	1	RO	B6 Tiny frag. Date?
196	1	48	RO	R73 2 50-400
217	2	13	RO	B6 R73.1 2F 120-300
261	1	27	RO	B6.1 2A 40-100
352	137	2664	LBA	FLIN 2 FLIN ORGAN 2 SAND 4 SHEL 2 FTD SHEL 2 SHEL 2B FTD SHEL 4 SHEL Late Bronze Age/Early Iron Age: good group. Chaff-temp. material interesting800-500 BC
366	1	1	LPR	FLIN Later prehistoric - single sherd only.
373	293	6825	LBA	FLIN 2 FND FLIN 2 FTD FLIN 2 FLIN 2B FTD FLIN 4 FLIN SAND 2 FTD SAND 4 SHEL 2 FTD SHEL 2 SHEL LBA/EIA: key group from zone 'Decorated assemblage' 8th-6th cal BC 800-500 BC
379	2	20	RO	SHEL
379	1	5	UN	B9 4 Date of context uncertain. Later prehistoric/early Roman
380	1	15	UN	ORGAN Single sherd only; dating uncertain
384	11	141	UN	SHEL
384	2	77	UN	R73 Date of context uncertain; later prehistoric - early Roman
385	59	1336	LBA	FLIN 2 FLIN ORGAN 2 ORGAN SAND 4 SHEL 2 SHEL 2B FTD800-500 BC LBA/EIA
386	73	1434	LBA	FLIN ORGAN 2B FTD ORGAN SAND 4 SAND SHEL 2 FTD SHEL 2 SHEL LBA/EIA: good group similar to [385] 800-500 BC
388	50	626	LBA	FLIN 2 FTD FLIN 2 FLIN ORGAN800-500 BC LBA/EIA
389	68	914	LBA	FLIN 2 FTD FLIN 2 FLIN 2U FTD FLIN ORGAN SAND SHEL 2 FTD SHEL LBA/EIA: 'Decorated' assemblage, carbon residue suggests cooking/domestic activity 800-500 BC
390	1	51	LBA	FLIN 2 LBA: Single rim of LBA form but could be contemporary with LBA/EIA groups. 1150-700 BC
391	5	150	LBA	SHEL Based on similar fabric from larger groups is probably LBA/EIA in date 800-500 BC
392	13	389	LBA	ORGAN SAND 4 BUD SHEL 2 FTD SHEL LBA/EIA 'decorated' assemblage including decorated fine ware bowl 800-500 BC
394	2	50	LPR	FLIN Later prehistoric; single flint-tempered sherd

Context	Count	Weight	Period	Comments
399	7	55	LBA	FLIN SAND 2 FND LBA/EIA 800-500 BC
400	5	71	LBA	FLIN 7 FLIN Possibly MBA element but late BA also present. 1450-800 BC
401	17	247	LBA	FLIN SAND SHEL 2 SHEL 800-500 BC LBA/EIA
415	7	106	LPR	FLIN 2 FLIN ORGAN
416	13	168	EIA	FLIN 2P FLIN ORGAN SAND SHEL EIA: Dating based on presence of footring base and parallels from other assemblages. 500-300 BC
430	1	11	LBA	FLIN 2 PNCD800-500 BC LBA/EIA
436	2	7	LPR	FLIN Later prehistoric
448	6	14	LBA	FLIN 2 FLIN Probably LBA/EIA
480	4	11	LPR	FLIN ORGAN Later prehistoric
509	4	22	LIA	FLIN GLAUC 2 GROG BC 50-50 late Iron Age
523	9	50	RO	R17.450-100
525	7	18	RO	B2 B21 B6 R17.1 R74.150-100 Single, abraded shds; poorly dated.
528	4	5	LPR	FLIN Indeterminate later prep; flint shds/frags.
529	37	267	LBA	FLIN 2 FLIN Nothing diagnostic except finishes probably Later BA. 1150-800 BC
534	2	5	RO	R73 50-400
536	3	16	RO	B6 R73 R74.1 2T 50-400
538	7	51	RO	B21 R14 4H R69 R73 abraded sherds 120-300
540	5	9	RO	B2 B6 R17.1 R74.1 abraded sherds 50-100
553	5	7	RO	B2 B21 LIA/ER BC 50-50
555	2	7	LPR	FLIN Later prehistoric
566	2	5	LPR	FLIN Later prehistoric
586	1	11	RO	R73 50-400
609	70	2825	RO	B2 2 B2 2T B2 2V BUD B2 2V B2 LIA/early Roman group: many substantial profiles; good group
614	1	4	LPR	FLIN Later prehistoric
615	1	2	LPR	SAND Later prehistoric
621	2	4	RO	B6 LIA/ERB 40-100
631	1	4	RO	R73 50-400
633	2	6	LPR	FLIN SAND Later prehistoric; just frags.
636	3	10	RO	B21 B6 40-100 LIA/ER
674	6	99	RO	B2 2T B21 2 B21 B6 2A R74.150-100 Early Roman forms
678	4	15	RO	R73 50-400
680	12	75	LBA	FLIN 2 FTD FLIN 800-500 BC LBA/EIA
681	34	359	LBA	FLIN 2 FLIN SAND 4 800-500 BC LBA/EIA
691	30	425	LBA	FLIN 2 FTD FLIN 2 FLIN 2I FLIN 800-500 BC LBA/EIA: some forms more LBA
692	1	22	LBA	FLIN Probably LBA/EIA
693	5	99	LBA	FLIN SAND 4 800-500 BC LBA/EIA
741	109	1021	EIA	FLIN 2 FTD FLIN 4 FLIN SAND EIA: based on presence of footring base 500-300 BC
771	1	2	RO	R73 50-400
811	1	3	LPR	FLIN Date uncertain; single shd

Context	Count	Weight	Period	Comments
830	19	96	RO	B6 B9 40-70 LIA/ER
832	1	5	LPR	FLIN Date uncertain; single shd
833	2	4	LPR	FLIN later prep; date uncertain
839	1	19	RO	B2 LIA/ER 40-100
844	164	1579	RO	B6 2V 40-100 LIA/ER
848	2	5	RO	R73 V abraded sherds (laminated) so date uncertain. 50-400
862	10	292	RO	B1 B2 2 B21 2/3 B6 40-100
863	146	1509	RO	B2 2 B2 2V B21 2 B21 2PD B21 B6 LIA/Early Roman: some unusual forms
864	5	5	RO	B2 B21 40-100 LIA/ER
872	15	84	LBA	FLIN 2 FND FLIN 800-500 BC LBA/EIA
873	3	5	LPR	FLIN Later prehistoric; date uncertain
875	10	91	LBA	FLIN 2 FND FLIN 2 FLIN 4 FLIN 800-500 BC LBA/EIA
878	42	414	LBA	FLIN 2 FTD 1000-500 BC LBA/EIA: single vessel only
884	53	758	LBA	FLIN 2 FLIN 4 FLIN 800-500 BC LBA/EIA
934	6	15	RO	B2 2 40-100
939	1	2	IA?	SAND Iron Age? single sherd so dating uncertain
944	1	1	LPR	FLIN Later prep; date uncertain
975	7	28	RO	R73.1 2F 120-300
978	2	2	LPR	FLIN SHEL Very tiny frags, both <1g. Later prehistoric; date uncertain
984	1	2	LPR	SHEL Later prehistoric
985	1	6	RO	B2 40-100
1045	2	4	LPR	SHEL Later prehistoric
1049	1	7	RO	R73 Single Roman shd
1149	3	32	RO	B6 40-100 LIA/ERB
1173	79	732	LBA	SAND SHEL 800-500 BC Presumably LBA/EIA but briquetage-like material difficult to date.
1175	139	1178	LBA	SHEL 800-500 BC Presumably LBA/EIA same briquetage-like material as [1173]
1176	77	995	LBA	SHEL 800-500 BC LBA/EIA same briquetage-like material as [1173] & [1175]
1177	19	245	LBA	FLIN 2 FLIN SAND 800-500 BC LBA/EIA
1178	45	830	LBA	FLIN 2 FTD FLIN 2 FLIN 2B FLIN SHEL 2 800-500 BC LBA/EIA
1179	33	294	LBA	FLIN 800-500 BC based on fabric only LBA/EIA
1180	64	737	EIA	FLIN 2 FTD FLIN SAND 4 SAND RED 600-300 BC Early Iron Age on polychrome bowl
1181	51	618	LBA	FLIN 2 FND FLIN 4 SHEL 800-500 BC LBA/EIA
1182	43	542	LBA	FLIN 2 FTD FLIN 4 SAND 2 SHEL 800-500 BC LBA/EIA
1185	34	443	LBA	FLIN 2 FTD FLIN 2B FLIN 4 FLIN SHEL 800-500 BC LBA/EIA
1187	17	294	LBA	FLIN 2B FTD FLIN SAND 800-500 BC LBA/EIA
1188	5	102	LBA	FLIN SHEL 2 FTD 800-500 BC LBA/EIA
1189	2	1	LPR	FLIN Frags. only

Context	Count	Weight	Period	Comments
1193	2	28	RO	B2 B21 LIA/ERB 40-100
1212	1	6	UN	SAND Single shd only, date uncertain
1225	4	21	RO	B21 R17.4 50-100
1230	1	1	LPR	FLIN Tiny frag only, date uncertain
1231	1	20	RO	B2 LIA/ERB
1232	1	13	RO	R43 5 120-250
1236	2	8	RO	B21 R42 5DR18 R42 5DR18 50-100

Table 7: Assessment of Prehistoric and Roman Pottery, additional detail for selected Late Bronze Age/Early Iron Age pit fills

Event code	Context	Count	Weight	Fabric	Description	Early date	Late date	COMMENTS
ARC 330 98	352	1	28	SHEL	4 - sandy fabric with fine shell	800	500	Late Bronze Age/Early Iron Age: good group. Chaff-temp. material interesting (See 4.6 above)
ARC 330 98	352	2	35	SHEL	2 - carinated shoulder with short rim; quite wide diam	800	500	
ARC 330 98	352	2	108	SHEL	2B FTD on shoulder & on rim. Round shoulder, out-turned rim	800	500	
ARC 330 98	352	5	42	SAND	4 - burnished ext & int surfaces; fine ware vessels probably bowls	800	500	
ARC 330 98	352	8	154	SHEL	2 FTD on rim giving cabled effect.	800	500	
ARC 330 98	352	8	218	FLIN	2 - two vessels with tall necks & low slight shoulders with burnished surfaces	800	500	
ARC 330 98	352	11	244	FLIN	Variety of vessels; mainly round shoulders with burnished surfaces	800	500	
ARC 330 98	352	50	909	ORGAN	2 - chaff-temp/briquetage like fabric some sherds with flat rim & strong finger-wiped impress	800	500	
ARC 330 98	352	50	926	SHEL	With flint; bs from coarse ware vessels. Bases with finger-pinched edges.	800	500	
ARC 330 98	373	1	5	FLIN	4 - with groove on rim	800	500	LBA/EIA: key group from zone 'Decorated assemblage' 8th-6th cal BC
ARC 330 98	373	1	5	SHEL	2 FTD cabled rim	800	500	

Event code	Context	Count	Weight	Fabric	Description	Early date	Late date	COMMENTS
ARC 330 98	373	1	40	FLIN	2B FTD rim sherd	800	500	LBA/EIA: key group from zone 'Decorated assemblage' 8th-6th cal BC
ARC 330 98	373	1	48	FLIN	2 FND upright, flat rim with FND on shoulder	800	500	
ARC 330 98	373	2	57	FLIN	2 FTD shoulder sherd with FTD	800	500	
ARC 330 98	373	4	64	FLIN	2 - jars with plain shoulders & upright rims, one with slight cabling	800	500	
ARC 330 98	373	6	41	SAND	4 - smoothed int & ext; bipartite bowl	800	500	
ARC 330 98	373	17	189	SHEL	- -	800	500	
ARC 330 98	373	17	824	SAND	2 FTD with flint; crudely made jar with round shoulder with FTD	800	500	
ARC 330 98	373	66	697	FLIN	- -	800	500	
ARC 330 98	373	177	4855	SHEL	2 - large sherds all appear to be 1 vessel; thick walled, flat rim slightly everted; finger wiped.	800	500	
ARC 330 98	385	1	10	SAND	4 - smoothed surfaces interior & exterior	800	500	LBA/EIA
ARC 330 98	385	1	16	ORGAN	2 - briquetage like material in small plain jar	800	500	
ARC 330 98	385	3	86	FLIN	2 - hooked-rim jar with wiped surfaces	800	500	

Event code	Context	Count	Weight	Fabric	Description	Early date	Late date	COMMENTS
ARC 330 98	385	4	74	SHEL	2B FTD everted rims with cabling	800	500	
ARC 330 98	385	6	110	FLIN	- -	800	500	
ARC 330 98	385	14	267	ORGAN	- -	800	500	
ARC 330 98	385	30	773	SHEL	2 - large coarse ware bs inc large frag. of base	800	500	
ARC 330 98	386	1	27	SAND	- - With flint	800	500	LBA/EIA: good group similar to [385]
ARC 330 98	386	2	65	ORGAN	2B FTD everted rim with cabling	800	500	
ARC 330 98	386	3	25	SHEL	2 -	800	500	
ARC 330 98	386	4	58	SHEL	2 FTD cable-effect on rim	800	500	
ARC 330 98	386	5	73	SAND	4 – part of bipartite bowl?	800	500	
ARC 330 98	386	10	212	FLIN	- -	800	500	
ARC 330 98	386	15	301	ORGAN	- -	800	500	
ARC 330 98	386	33	673	SHEL	- -	800	500	
ARC 330 98	389	1	8	SAND	- -	800	500	LBA/EIA: 'Decorated' assemblage, carbon residue suggests cooking/domestic activity

Event code	Context	Count	Weight	Fabric	Description	Early date	Late date	COMMENTS
ARC 330 98	389	1	10	FLIN	2 - flower-pot shaped jar	800	500	
ARC 330 98	389	1	10	SHEL	2 FTD short, slightly everted rim	800	500	
ARC 330 98	389	2	11	ORGAN		800	500	
ARC 330 98	389	2	85	FLIN	2U FTD upright, straight-walled jars with no discernible shoulder; FTD below rim	800	500	
ARC 330 98	389	3	55	FLIN	2 shoulder shds with FTD	800	500	
ARC 330 98	389	5	60	SHEL		800	500	
ARC 330 98	389	53	675	FLIN	Misc body shds	800	500	

Notes to Tables:

Fabric codes
CAT fabric codes are prefixed by : 'R' Roman or 'B' Belgic

MoL codes are common names based on main inclusion type:
FLIN flint-tempered; SAND sand-tempered; SHEL shell-tempered; ORGAN organic-tempered; GLAUC glauconite-rich; GROG – grog-tempered;

Comments field

Form codes:

2	Jar	Unspecified Jar
2/3	JAR/BEAKER	Jar or beaker; enclosed vessel
2A	JAR	Bead-rimmed jar
2F	JAR	Black-burnished-type everted-rimmed jar
2PD	JAR	Pedestal-based jar
2T	JAR	Otherwise indistinguishable necked jar
2U	JAR	Upright/plain rim jar
2V	JAR	Storage jar (other than 2m)
4	BOWL	Miscellaneous or otherwise unidentifiable bowl
4H	BOWL	Rounded-rimmed BB-type bowl
5	DISH	Miscellaneous or otherwise unidentifiable plate
5A	DISH	Plate with plain exterior profile
5DR18	DISH	Dragendorff 18 (Samian form)

Decoration:
FTD – finger-tipped decoration
FND – Finger nail decoration

shd(s) – sherd(s)
bs – body sherd

APPENDIX 2: ASSESSMENT OF POST-ROMAN POTTERY

Lyn Blackmore

1. Introduction

1.1 A few sherds of pottery were recovered from the excavation of ARC CRS 98, while a slightly larger assemblage was recovered from features examined during the watching brief and from features uncovered during the chainage works (ARC 330 98). Most of the combined collection comprises early medieval domestic wares, although some post-medieval material was present on ARC CRS 98. No Saxon pottery was found.

2. Methodology

2.1 The pottery was recorded on a context-by context basis by fabric, sherd count and weight using fabric codes which are in line with those of the Canterbury Archaeological Trust.

3. Quantifications

3.1 Six sherds from three contexts were found on ARC CRS 98 (43g). Of these five sherds from two vessels date to the late 18th or 19th century.

3.2 A total of 99 sherds from up to 42 pots were recovered from 13 contexts during the watching brief. Most are body sherds, with only ten rims. The overall dating lies between 1050-1250, although most contexts seem to date to 1150-1250. The dominant fabric is the local shell-tempered ware EM35, but a range of sub-types is also present which contain variable amounts of sand.

3.3 A total of 15 sherds from up to 13 pots was recovered from three areas of chainage contexts during the watching brief. Most sherds are shell-tempered wares dating to 1180-1250; these include two rims. Later material comprises single sherds dating to the late 14th or 15th century (Coarse Border-type ware), the late 15th or 16th century, and the late 18th century (Whieldon-type ware).

4. Provenance

4.1 The distribution of the pottery is patchy.

4.2 The medieval sherd pottery from ARC CRS 98 is from a colluvial deposit ([8]). The post-medieval material is from modern contexts ([8], [24]).

4.3 The pottery from the watching brief is from ten different features. One small and abraded sherd of coarse sandy ware from a possible Roman ditch could be of Roman or medieval date ([194]) (Pit 195, Figure 10). Numerically the largest single group is that from ditch [808] (equated to [806], Figure 8), which contained 28 sherds, but these derive from only two pots. Ditches [1046] (Figure

10) and [1136] (Henhurst Plant Crossing, not shown) contained only one small sherd and five small sherds respectively.

4.4 The largest actual group is from two different fills in quarry pit 1211 (15 sherds from nine different pots). A total 27 sherds was recovered from four other pits (pits 463 and 768, equated to [1148], each had two different layers containing pottery, Figure 8). In addition, 14 sherds were found in hearth or firepit [419] (Figure 11). Of interest is a wheel-thrown pot with everted rim found in pit [163], the form of which is very like that of the Late Saxon shelly wares found in London. Most of the assemblage is small and abraded, but several larger pieces are also present (notably [162], [809], [1210]).

4.5 The medieval sherds from the chainage works are from the general area of Chainage (CH)43+140, from about 75m to the south of the main line. The late medieval and early post-medieval finds are from CH42+230 – 42+286, while the latest is from CH43+060.

4.6 Most of the medieval wares are shell-tempered wares that are probably of quite local origin, but a jug sherd from the chainage assemblage is probably from London (calcareous variant).

5. Conservation

5.1 There are no conservation requirements.

6. Comparative material

6.1 The pottery is similar to that from West Northumberland Bottom, and can be compared with the contemporary finds from other medieval sites in north Kent, notably Rochester (*eg.* Tester 1968; 1970; 1972), and Temple Manor, Strood. To the west are Joydens Wood (Tester and Caiger 1958), Lesnes Abbey (Dunning 1961) and Dartford (Mynard 1973), while to the south-west are Eynsford Castle (Rigold 1971; 1973; finds in Maidstone Museum) and the manors of Fawkham and Scotgrove (finds held by Dartford Museum). On all these sites shell-tempered wares are common, and seem to have continued well into the 13th century.

7. Potential for further work

7.1 The potential of the finds from ARC CRS 98 is limited, and they certainly cannot help identify features of Saxon date. Those from the watching brief ARC 330 98, however can assist in the dating and interpretation of the different medieval features and the interpretation of the site.

7.2 The pottery from the watching brief, although largely unstratified, can be used to address the theme of 'Towns and rural landscapes (100 BC – AD 1700). The precise location of the settlement or farm in which the pottery was used must remain uncertain but sufficient sherds are from features to suggest that this was not far away. When considered with the finds from Zone 3 (ARC WNB 98 and ARC HRD 99) these sherds can inform on the development of settlement in north

Kent, and also on wider connections. Most of the medieval wares seem to be typical of the area, but the London-type ware jug sherd is of interest in that it indicates trade beyond the immediate region. The possible presence of Ashford-type wares (both shell-tempered and the later sandier types) is intriguing in this location as the site lies outside the normal distribution range of this ware, which is mostly found in southern Kent. The identification of the Ashford-type wares, therefore, needs to be verified.

7.3 The 'Late Saxon' shell-tempered pot from [164] should be drawn, and it must be determined if this can date the earliest activity on the site (see above, 4.4).

Further work

7.4 If the pottery is to be used to address the research aims, the following tasks should be carried out

- Correlate pottery with the spatial distribution on the across the site
- Research selected fabrics and forms
- Prepare report and catalogue
- Editing, meetings
- Illustration

8. Bibliography

Dunning, G C, 1961, 'A group of English and imported medieval pottery from Lesnes Abbey, Kent' *Antiq Journ* 41, 1-12.

Mynard, D C, 'Medieval Pottery from Dartford' *Archaeol Cantiana* LXXXIII, 187-99.

Rigold, S E, 1971, 'Eynsford Castle and its Excavation' *Archaeol Cantiana* LXXVI, 109-172.

Rigold, S E, 1973, 'Eynsford Castle: the Moat and Bridge' *Archaeol Cantiana* LXXVIII, 87-116.

Tester, P J, 1968, 'Medieval' in A C Harrison & C Flight 'The Roman and Medieval Defences of Rochester in the light of recent excavations', *Archaeol Cantiana* 83, 94-99.

Tester , P J, 1970, 'Medieval Pottery' in A C Harrison 'Excavations in Rochester', *Archaeol Cantiana* 85, 108-111.

Tester, P J, 1972, 'Medieval' in A C Harrison 'Excavations at Rochester East Gate 1969' *Archaeol Cantiana* 87, 142-150.

Tester, P J, and Caiger, J E L, 1958, 'Medieval Buildings in the Joyden's Wood square earthwork' *Archaeol Cantiana,* 72, 18-39.

Table 8: Assessment of Post-Roman pottery, quantification and attributes

Event code	Context	Count	Weight	Period	Fabric groups, form type, decoration and date
ARC CRS 98	8	4	7	PM	LPM18AA TPOT? Date 1770-1900
ARC CRS 98	15	1	12	PM	LPM4 DISH. Date 1800-1900
ARC CRS 98	24	1	24	MD	EM36? CP. Date 1140-1250
ARC 330 98	31	6	36	MD	EM48 CP, EM38A CP RIL. Date 1175-1250
ARC 330 98	162	4	135	MD	EM36 CP, EM100 CP. Date 1100-1250
ARC 330 98	194	1	4	MD	MISC CP. Date 1100-1200
ARC 330 98	418	14	21	MD	EM.M5 CP EM35 CP. Date 1125-1225
ARC 330 98	462	5	25	MD	EM35 CP, EM36CP. Date 1100-1225
ARC 330 98	606	2	4	MD	EM35 CP. Date 1050-1225
ARC 330 98	769	7	22	MD	EM36 DISH, EM48 CP. Date 1100-1250
ARC 330 98	771	2	12	EM/MD	EM35. Date 1050-1225
ARC 330 98	809	28	173	EM/MD	EM35 CP. Date 1050-1225
ARC 330 98	1045	7	36	MD	EM35 CP, EM40A CP. Date 1170-1225
ARC 330 98	1047	1	4	MD	M38A CP. Date 1175-1350
ARC 330 98	1136	5	23	MD	EM31 CP, M38A JUG INCD. Date 1175-1250
ARC 330 98	1210	11	113	MD	EM31 CP, EM35 CP, M38A DISH M38A JUG, M38A JUG. Date 1175-1200
ARC 330 98	0 (CH 42.230 42.286)	2	6	MD	M41 CP, LM1 DISH. Dates 1340-1400; 1475-1550
ARC 330 98	0 (CH 43+140)	12	94	MD	EM29? CP, EM31? CP, EM35 CP, EM45 CP, EM48 CP, M5 JUG. Date 1180-1250
ARC 330 98	0 (CH 43.060)	1	3	PM	PM43A TPOT? Date 1740-1780

Note: the comments field lists each Canterbury Archaeological Trust fabric code, followed by the forms present. The use of a decoration code beside the form code shows that this is the only type present in the context; the use of decoration codes in brackets shows that some, but not all, sherds are decorated. Fabric codes are separated by commas. This field also shows the date assigned to the pottery in the context.

Expansions of Canterbury Archaeological Trust pottery codes.

M EM.M5	Ashford Potter's Corner Sandy Ware with fossil shell	1125-1250
M EM29	Kentish Sandy Ware with flint+sparse shell	1125-1225
M EM31	?Kentish Coarse Sandy Ware with moderate shell	1100-1200
M EM35	N/W Kent Shell-Tempered	1050-1225
M EM36	N/W Kent Sandy And Shell-Tempered	1100-1250
M EM40A	N French Fine Whiteware With Fe0 Inclusions	1170-1250
M EM45	Non-Local Coarse Sandy Ware	1050-1400
M EM48	N/W Kent? Shell-Filled Fine Sandy Ware	1050-1250
M M5	London-Type Ware	1140-1350
M M38A	N/W Kent Sandy Ware (Mainly Reduced)	1175-1350
M M41	Coarse Border Ware	1340-1500
PM LPM4	Sunderland-type slipware	1800-1900
PM LM1	Late Medieval Tyler Hill Ware	1475-1550
PM LPM18A	Black Basalt ware	1770-1900
PM LPM43A	Creamware - Whieldon Type	1740-1780

Expansions for form codes shown in this report

Per	Form	Expansion
M	CP	Cooking Pot
M	DISH	Dish
M	INDV	Industrial Vessel
M	JUG	Jug
PM	BOWL	Bowl
PM	DISH	Dish
PM	FLP	Flower Pot
PM	JAR	Jar
PM	SAUC	Saucer
PM	TPOT	Tea Pot

Expansions for decor codes shown in this report

Per	Decoration	Expansion
M	INCD	Incised Decoration
M	RIL	Rilled Decoration

APPENDIX 3: ASSESSMENT OF CERAMIC BUILDING MATERIAL /ASSESSMENT OF FIRED CLAY

Ian Betts

1. Introduction

1.1 To establish the full extent and the morphology of structures and other archaeological remains. All the building material from ARC CRS 98 came from three contexts and consists of daub, roofing tile (probably peg tile), glazed wall tile and unidentified fired ceramic. The ARC 330 98 material comprises mainly daub with a small quantity of ceramic Roman tile and post-medieval peg roofing tile and brick. A small quantity of stone rubble is also present.

1.2 Study of the material should assist with the following field event aims:

- To establish the full extent and the morphology of structures and other archaeological remains.
- To establish a dated sequence of occupation and use.

2. Methodology

2.1 All the material was examined and recorded for the assessment.

2.2 The daub assemblage has been counted and weighed.

2.3 The data have been entered on an ORACLE database and transferred to RLE Datasets.

2.4 All the material has been retained for future analysis.

3. Quantifications

3.1 The assemblage size from ARC CRS 98 is fairly small, just 280g, of which 250g is daub, 20g rooftile, 5g as unidentified fired ceramic. There are 28,793g of building material from ARC 330 98, mainly daub, with 1380g of peg roofing tile, 18,360g of brick, 310g of Roman roofing tile and 50g of stone rubble. From the chainage (CH) sites are 685g of mainly peg roofing tile with a small quantity, 20g, of post-medieval brick.

3.2 The daub from contexts ARC CRS 98 [4] and ARC 330 98 [691] is mainly grey or partially grey in colour indicating that it has been subject to heat. It is somewhat unusual in being made with large flint inclusions (up to 13mm across). The probable daub from contexts ARC 330 98 [373], [458] (Pit [374], Figure 7), and [1187] (Pit [1174, Figure 6) is very unusual in containing crushed fragments of chalk up to 5mm across (fabric type CRS1). The probable daub in context [529] (Pit 537, Figure 10) is characterised by organic impressions in the clay matrix.

3.3 There is a curved fragment of building material with a smoke blackened inner surface (context [1182], Pit [1172], Figure 6). This may be daub or it could be an underfired corner of a Roman box flue tile in fabric group 2815 (type 3006). A

fragment of abraded fired ceramic in context [455] looks Roman although there is no definite proof. Definite Roman tile was recovered from contexts [536] (imbrex), [538], [688], and [1210] (tegula).

3.4 The only definite medieval peg tile is from CH 43+000 and has a glazed upper surface. All the other peg tile is probably late-medieval or, more likely, post-medieval in date. A number of bricks were recovered from the brick kiln [720], Figure 11 (contexts [464], [691], [717]) . These measure 224-232 mm in length, 108-112 mm in breadth by 48-56 mm in thickness. It is not possible to accurately date bricks based on size by they were associated with pottery dated 1740-1780 in context [691], which would suggest a mid-late 18th century date. Some have indented borders in their top edges, which is normally a feature of pre-Great Fire of 1666 brickwork in London. However, there is no reason why the use of the mould base to flatten down the brick edges (which is the cause of these marks) could not have persisted in a Kent brickyard long after 1666.

3.5 The small fragment of wall tile (context ARC CRS 98 [15]) is probably Victorian in date or later. The base is smoothed off whilst the top surface is decorated with a pale yellow glaze. The tile is 8 mm thick and is made with a red clay fabric containing common very small quartz and calcium carbonate inclusions (up to 0.2mm). It appears to be machine-made, although this is not absolutely certain.

4. Provenance

4.1 The precise provenance of the ARC CRS 98 material is not known at this stage. The daub may be Bronze Age, but the remaining material probably derives from the large pits of presumed post-medieval date. The phasing and the location of the ARC 33098 material has not yet been examined.

5. Conservation

5.1 None required, but care should be taken to store the daub in a dry environment.

6. Comparative material

6.1 If the daub is of Bronze Age date then it should be compared with daub of similar date from other sites in the project, such as Cobham Golf Course (Area 330 Zone 5 ARC CGC 98).

6.2 The fabric of other bricks should be examined to see if they match those used in the brick kiln.

7. Potential for further work

7.1 The assemblage appears to comprise material of two, or possibly three periods, the Bronze Age, probable Roman and the post-medieval period. It has some limited potential to answer information on the following original Landscape Zone aims and Field Event aims:

- *Farming communities (2,000-100BC)*

7.2 The daub could provide evidence for the use of this material for structural or other purposes in the Bronze Age

- *Towns and their rural landscapes (100 BC-1700 AD)*

7.3 The scatter of Roman roofing tile and other small unidentified fragments, suggest the presence of a Roman building somewhere in the vicinity, but its abraded quality indicates that it has been subjected to some disturbance over the centuries, probably from the affects of ploughing. Similarly there is no definite evidence for medieval occupation apart from one fragment of glazed roofing tile, which may well have derived from elsewhere. Post-medieval occupation is indicated by ceramic roofing tile and brick.

- *The recent landscape (1700-1945 AD)*

7.4 The roofing tile may provide evidence for the type of roof covering used on building in this part of Kent during the post-medieval period, whilst the wall tile gives an indication as to the type of internal decoration employed. The fabric type indicated movement of building material as the fabric of the roof tiles suggests an origin in the London area. The mid-late 18th century bricks derive from the only structure from this period, thought to be a brick kiln.

7.5 Tasks: building materials

- Combine the stratigraphic and dating information to determine the chronological and spatial patterning of the assemblage.
- Comparison with daub of similar date from other sites in the project
- Further analysis of the wall tile to determine a more precise date and if possible place of manufacture.
- Illustration of two bricks from the kiln, one showing the indented border and the other a ridge of clay running along the top edge
- Write publication report

8. Bibliography

None

Table 9: Assessment of Ceramic Building Material /Assessment of Fired Clay ARC CRS 98

Event code	Context	Count	Weight	Type (brick/ tile etc.)	Period (spot date)	Comments (decoration/ glaze/ fabric)
ARC CRS 98	4	13	250	Daub	UN	3102, most burnt, undated
ARC CRS 98	8	1	10	Peg?	PM	2586, abraded, 1480-1800
ARC CRS 98	8	2	10	Peg	PM	2271, x1 sanding near 2276, 1480-1800
ARC CRS 98	8	4	5	?	UN	Fired ceramic, undated
ARC-CRS 98	15	1	5	Wall tile	PM	Victorian?, pale yellow glaze, 1800-1900

MoL ceramic fabric types: 3102 (daub), 2271, 2276, 2586

Table 10: Assessment of Ceramic Building Material /Assessment of Fired Clay ARC 330 98

Event Code	Context	Count	Weight	Type	Period	Comments
ARC 330 98	373	3	35	Daub?	UN	CRS1, undated
ARC 330 98	455	1	5	Fired clay	RO	2815, 50-400
ARC 330 98	691	3	35	Daub	UN	3102, undated
ARC 330 98	741	2	10	Daub	UN	3102, undated
ARC 330 98	1173	22	95	Daub	UN	3102, undated
ARC 330 98	1176	21	135	Daub	UN	3102, undated
ARC 330 98	1178	69	540	Daub	UN	3102, undated
ARC 330 98	1179	1	10	Daub	UN	3102, undated
ARC 330 98	1180	27	190	Daub	UN	3102, undated
ARC 330 98	1181	35	180	Daub	UN	3102, undated
ARC 330 98	1182	14	115	Daub	UN	3102, undated
ARC 330 98	1182	1	10	Daub?	UN	3102? Or RCBM Flue Tile, undated
ARC 330 98	1187	1	20	Daub?	UN	CRS1, undated

MoL ceramic fabric types 3102 (daub), 2815

APPENDIX 4: ASSESSMENT OF WORKED AND BURNT FLINT

Philippa Bradley

1. Introduction

1.1 Small groups of worked flint were recovered from the excavations. The worked flint consists of mostly hard-hammer struck flakes. A few retouched forms (retouched, used flakes or serrated flakes, a knife) were recovered, together with some minimally worked cores and tested nodules. The flint is not closely datable but is consistent with a Neolithic-Bronze Age date.

1.2 Burnt unworked flint was recovered throughout this zone. The burnt unworked flint consists of a range of small to large sized fragments or pebbles of heavily calcined flint.

2. Methodology

2.1 The worked and burnt unworked flint was recorded onto the Oracle database using standard MoLSS methods. The material was recorded by typological group, where appropriate notes were made on pertinent technological attributes. Brief notes were also made on the general condition of the material. The burnt unworked flint was briefly scanned and quantified, a general note of the condition of the material was also made. Natural unworked flint was discarded.

3. Quantifications

3.1 A total of 252 pieces of worked flint and 1664 pieces of burnt unworked flint (weighing 35,985g) were recovered from ARC TLG 98, ARC CRS 98 and ARC 330 98.

4. Provenance

4.1 The worked flint was recovered from only a limited number of contexts. The burnt unworked flint was spread over more contexts but, apart from a few contexts, the numbers of pieces recovered was generally less than 10. The distribution by weight is slightly more varied (see tables below).

4.2 The flint came from a range of features across the zone including cut features, natural features and layers. Given the predominance of Late Bronze Age/Early Iron Age and later ceramics from the site and the sparse nature of the lithics it is likely that the majority of the lithics are redeposited. The condition of some of this material would support this suggestion, many pieces exhibiting abrasion and wear consistent with redeposition. A couple of contexts produced material that was very fresh with sharp edges and some material which may refit (eg contexts [187] (Figure 11) and [433] (Pit 434, Figure 8), but these are relatively isolated instances.

5. Conservation

5.1 The flint is appropriately bagged and boxed for long-term storage. Some of the burnt unworked flint is beginning to disintegrate, however, there is little that can be done to prevent this. No conservation is required. All of the natural flint has been discarded.

5.2 Selected burnt unworked flint could be discarded, keeping only a selection of representative material for archive purposes. The full quantification, by weight and number, together with a description of the material discarded, would provide sufficient records for any future work.

6. Comparative material

6.1 In the local context this flint compares well with material from adjacent sites. Lithics were recovered from the Neolithic mortuary enclosure at Tollgate (URL 1995) and flint from the evaluation at ARC TGS 97 was identified as ranging in date from the Mesolithic to the Bronze Age (URL 97). A single Lower Palaeolithic bifacial hand axe was recovered from this evaluation (URL 97) (Figure 5).

6.2 The flint compares well with other material recovered from the CTRL route. Considerable quantities of Neolithic and Bronze Age flintwork have been recovered from Kent principally through the fieldwork undertaken for the CTRL but also from other, mostly as yet unpublished excavations.

7. Potential for further work

7.1 Given the restricted range of material recovered and given that the flint is largely redeposited, the potential for further analysis is low. The lack of diagnostic dating precludes anything other than a very broad date range being proposed for this material. The flint indicates sparse prehistoric activity occurring in the area. However, the flint takes on slightly more significance; the possible denuded megalithic monument from Zone 4 and the mortuary enclosure at Tollgate provide a background for this small group of lithics. Although there is little within the groups of flint that would suggest ritual activity *per se*, some of the artefacts may have been used in ritual activities or activities associated with the monuments. As a group the material is not closely datable, a few soft-hammer struck flakes, and blade-like flakes may indicate Neolithic activity but the retouched forms recovered could equally belong to the earlier Bronze Age. A single core had some platform edge preparation, other examples were minimally worked.

7.2 The flint can to a limited extent contribute to the Research Objectives identified:

- *Farming communities (2000-100BC)*

7.3 Lithics may help to clarify the pre-Late Bronze Age activities on site but given the generally small numbers and the lack of diagnostic forms this may be somewhat limited.

7.4 The lithics may also shed light on the ritual and ceremonial use of the landscape, but, again, the numbers of pieces involved may hamper a detailed analysis.

7.5 If the flint is to be included within the publication, it is recommended that this assessment report can be used as a basis, a little time would be required to prepare the text for publication purposes. The possible refitting flints are examined, and the fresh material, should be looked at in order to identify possible usewear that may shed light on the activities carried out on the site. The flint would be compared with the material from Tollgate and other sites as necessary. No illustrations would be required.

- Investigate possible refitting flint and possible usewear
- Comparison with Tollgate lithics and material from evaluations
- Time for preparing a summary publication

8. Bibliography

URL 1995, 'Assessment of worked flint from Tollgate', unpublished report prepared by Bradley, P for OAU

URL 1997, 'South-East of Tollgate (ARC TGS 97)' Evaluation Flint assessment prepared by Cotton, J, for MoLAS

Table 11: Worked Flint ARC TLG 98

Event code	Context	Count	Period	Comments
ARC TLG 98		-		Natural Sample 8
ARC TLG 98		-		2 Natural, Sample 9
ARC TLG 98		-		1 natural, Sample 10
ARC TLG 98		-		3 Natural, sample 11A
ARC TLG 98		-		1 Natural, sample 11B
ARC TLG 98		-		5 Natural, sample 12
ARC TLG 98		-		1 Natural, Sample 13
ARC TLG 98		-		1 Natural, sample 17
ARC TLG 98		2		2 small flakes, sample 18
ARC TLG 98		1		1 small wholly cortical flake, 1 natural , sample 19
Total		3		

Table 12: Burnt Flint ARC TLG 98

Event code	Context	Count	Weight (g)	Comments *
ARC TLG 98		2	3	Sample 25
ARC TLG 98		1	1	Sample 2
ARC TLG 98		2	5	Sample 26
ARC TLG 98		3	9	Sample 15
ARC TLG 98		1	4	Sample 18
ARC TLG 98		1	2	Sample 19
ARC TLG 98		3	6	Sample 3
Total		13	30	

* all heavily calcined white to grey

Table 13: Worked Flint ARC CRS 98

Event code	Context	Count	Period	Comments
ARC CRS 98	17	2		1 slightly blade-like
Total		2		

Table 14: Worked Flint ARC 330 98

Event code	Context	Count	Period	Comments
ARC 330 98	32	1		Broken flake
ARC 330 98	80	9		All worn and battered, some broken, 1 or 2 are irregular, also 11 natural
ARC 330 98	82	1		Small burnt flake, also 14 natural
ARC 330 98	89	3		3 poss SH flakes, inc 1 with thermal scars, also 2 natural
ARC 330 98	143	-		2 natural
ARC 330 98	177	6		Inc 1 wholly cortical flake, 1 chunky flake, several HFs
ARC 330 98	186	1		Flake
ARC 330 98	187	3		Inc 1 flake with thermal surfaces – poss used? Very fresh and sharp edges
ARC 330 98	190	1		Bullhead flake, wholly cortical dorsal face
ARC 330 98	192	5		Flakes, also 1 natural
ARC 330 98	196	2		Small flakes, also 2 natural
ARC 330 98	198	1		Flake
ARC 330 98	222	1		Small flake
ARC 330 98	373	1		Flake
ARC 330 98	418	1		HF flake
ARC 330 98	418	1		Large HF flake with much later damage, 1 small area of possible use
ARC 330 98	418	1		Flake
ARC 330 98	433	6		?poss refits – several trimming flakes all very sharp and fresh
ARC 330 98	436	1		Flake
ARC 330 98	448	2		Flakes
ARC 330 98	448	1		Core on a large thermal flake, some flakes taken from the dorsal cortical side, also 2 natural
ARC 330 98	529	4		Flakes inc 1 very large flake
ARC 330 98	529	1		Core fragment, irregularly worked
ARC 330 98	538	1		?Axe thinning flake from polished axe
ARC 330 98	553	2		Flakes 1 has thermal surfaces
ARC 330 98	571	1		Flake
ARC 330 98	614	6		All worn and battered, 1 has been broken post-ex, also 5 natural
ARC 330 98	615	4		All small flakes, also 1 natural
ARC 330 98	617	1		slightly blade-like, heavily corticated
ARC 330 98	631	6		All worn
ARC 330 98	633	7		All worn, also 1 natural
ARC 330 98	680	7		Flakes inc a couple of slightly blade-like flakes
ARC 330 98	681	4		Flakes inc 2 large ?trimming flakes
ARC 330 98	681	1		Thick flake

Event code	Context	Count	Period	Comments
ARC 330 98	688	-		Natural
ARC 330 98	689	1		Flake
ARC 330 98	691	-		Natural
ARC 330 98	700	1		Flake also 1 natural
ARC 330 98	726	2		1 flake has platform preparation
ARC 330 98	735	10		inc some trimming flakes - dorsal and side
ARC 330 98	736	1		Small HF flake
ARC 330 98	737	12		inc some trimming flakes - dorsal and side, also 1 natural
ARC 330 98	737	6		Flakes, also 1 natural
ARC 330 98	737	1		HF flake
ARC 330 98	737	1		Flake
ARC 330 98	737	1		Large worn and damaged flake
ARC 330 98	742	1		Flake
ARC 330 98	747	3		Flakes
ARC 330 98	747	1		Core fragment - flake core
ARC 330 98	747	1		Possible smoother, oval pebble with some signs of use, also lightly burnt
ARC 330 98	750	1		Flake
ARC 330 98	751	3		Flakes, also 1 natural
ARC 330 98	771	4		Flakes, inc trimming flakes
ARC 330 98	805	1		Flakes
ARC 330 98	814	2		Flakes
ARC 330 98	830	2		Flakes
ARC 330 98	832	5		Flakes
ARC 330 98	832	1		Core on a partly cortical flake, some plat preparation
ARC 330 98	832	1		Flake
ARC 330 98	835	3		Flakes inc 2 burnt flakes, also 8 natural
ARC 330 98	835	1		Retouched flake, very worn and some later damage
ARC 330 98	835	1		Serrated flake, worn edges both poss originally used
ARC 330 98	835	1		Possible tested nodule, some thermal fractures but a couple of flake scars, also 35 natural
ARC 330 98	835	1		Core fragment, also 30 natural
ARC 330 98	844	1		Thick, almost cortical dorsal trim flake
ARC 330 98	863	3		Inc 1 thick flake
ARC 330 98	867	1		Flake, also 1 natural and 1 pebble - not worked
ARC 330 98	872	5		Flakes
ARC 330 98	873	29		Many small HF flakes, also 1 CRF tablet - irregular, also 9 natural
ARC 330 98	873	1		Small core flake removals
ARC 330 98	873	1		Heavily burnt flake fragment
ARC 330 98	875	2		Flakes
ARC 330 98	878	9		Flakes, also 16 natural
ARC 330 98	878	1		Retouched flake, minimal retouch poss just use

Event code	Context	Count	Period	Comments
ARC 330 98	884	-		Large natural pebble
ARC 330 98	939	-		Large natural pebble
ARC 330 98	946	1		Small HF flake
ARC 330 98	959	-		Natural
ARC 330 98	978	1		Flake
ARC 330 98	978	1		Core fragment, very irregularly worked, some incipient cones
ARC 330 98	981	1		1 flake, also 1 natural
ARC 330 98	984	1		Flake
ARC 330 98	998	-		Natural
ARC 330 98	1045	1		Creamy flint flake
ARC 330 98	1149	1		Possible flake, worn
ARC 330 98	1173	1		Small fragment
ARC 330 98	1173	1		Wholly cortical flake from smallish flake
ARC 330 98	1173	1		?knife some retouch but a lot of damage, partly cortical blank
ARC 330 98	1173	6		All fairly small flakes
ARC 330 98	1182	1		Flake
ARC 330 98	1186	4		Also 3 natural
ARC 330 98	1189	-		1 natural
ARC 330 98	1189	1		Small flake
ARC 330 98	1209	1		Irregular flake, concreted with ?iron pan
ARC 330 98	1210	10		Some trimming flakes, also 1 natural
ARC 330 98	1230	-		1 natural lump
ARC 330 98	1232	-		Natural
ARC 330 98	1236	-		Natural
Total		247		

Table 11: Burnt Flint ARC 330 98

Event code	Context	Count	Weight (g)	Comments *
ARC 330 98	32	1	83	
ARC 330 98	80	4	108	
ARC 330 98	82	1	11	
ARC 330 98	143	10	259	
ARC 330 98	177	20	338	
ARC 330 98	179	4	61	
ARC 330 98	194	2	1	
ARC 330 98	196	1	15	
ARC 330 98	198	2	5	
ARC 330 98	217	1	12	
ARC 330 98	225	1	2	
ARC 330 98	250	2	40	
ARC 330 98	352	24	233	
ARC 330 98	373	3	159	
ARC 330 98	379	1	60	
ARC 330 98	384	25	120	
ARC 330 98	386	1	61	

Event code	Context	Count	Weight (g)	Comments *
ARC 330 98	390	231	2027	
ARC 330 98	399	6	70	
ARC 330 98	400	1	46	
ARC 330 98	417	77	2248	
ARC 330 98	418	19	232	
ARC 330 98	428	10	5	
ARC 330 98	433	22	199	
ARC 330 98	436	1	87	
ARC 330 98	448	39	897	
ARC 330 98	462	1	42	
ARC 330 98	480	7	58	
ARC 330 98	526	4	14	
ARC 330 98	527	3	15	
ARC 330 98	529	41	2839	
ARC 330 98	535	2	11	
ARC 330 98	538	2	80	
ARC 330 98	567	6	89	
ARC 330 98	570	5	19	
ARC 330 98	575	5	19	
ARC 330 98	611	2	5	
ARC 330 98	614	7	28	
ARC 330 98	631	2	130	
ARC 330 98	633	5	6	
ARC 330 98	680	2	29	
ARC 330 98	686	2	6	
ARC 330 98	688	8	79	
ARC 330 98	700	6	8	
ARC 330 98	701	3	33	
ARC 330 98	735	1	11	
ARC 330 98	736	2	69	
ARC 330 98	736	6	24	
ARC 330 98	737	6	322	
ARC 330 98	747	2	62	
ARC 330 98	754	11	95	
ARC 330 98	756	7	193	
ARC 330 98	771	3	158	
ARC 330 98	773	10	13	
ARC 330 98	805	1	56	
ARC 330 98	809	4	2	
ARC 330 98	811	3	6	
ARC 330 98	812	3	172	
ARC 330 98	818	5	58	
ARC 330 98	820	4	46	
ARC 330 98	825	3	7	
ARC 330 98	828	2	20	
ARC 330 98	831	3	24	
ARC 330 98	832	6	62	
ARC 330 98	833	1	57	
ARC 330 98	835	5	37	

Event code	Context	Count	Weight (g)	Comments *
ARC 330 98	864	8	47	
ARC 330 98	872	1	82	
ARC 330 98	873	7	253	
ARC 330 98	875	7	163	
ARC 330 98	878	14	889	
ARC 330 98	884	11	625	
ARC 330 98	901	2	85	
ARC 330 98	934	1	6	
ARC 330 98	939	1	96	
ARC 330 98	948	3	116	
ARC 330 98	951	2	12	
ARC 330 98	890	6	12	
ARC 330 98	905	3	7	
ARC 330 98	981	3	27	
ARC 330 98	984	4	11	
ARC 330 98	998	1	7	
ARC 330 98	1084	2	23	
ARC 330 98	1168	1	23	
ARC 330 98	1173	1	17	
ARC 330 98	1173	15	139	
ARC 330 98	1175	2	31	
ARC 330 98	1175	39	193	
ARC 330 98	1182	1	37	
ARC 330 98	1182	1	11	
ARC 330 98	1186	1	9	
ARC 330 98	1186	3	64	
ARC 330 98	1188	1500	1416	
ARC 330 98	1206	6	26	
ARC 330 98	1210	1	22	
ARC 330 98	1216	1	13	
ARC 330 98	1218	3	5	
ARC 330 98	1226	1	17	
ARC 330 98	1231	6	49	
ARC 330 98	1232	5	7	
ARC 330 98	1236	5	20	
ARC 330 98	777	3	3	
ARC 330 98	448	7	76	
ARC 330 98	974	2	4	
ARC 330 98	839	5	39	
ARC 330 98	190	5	58	
ARC 330 98	555	2	3	
ARC 330 98	625	2	1	
ARC 330 98	956	5	25	
ARC 330 98	1182	16	41	
ARC 330 98	878	7	1	
ARC 330 98	1138	3	7	
ARC 330 98	674	23	67	
ARC 330 98	420	9	58	
ARC 330 98	1196	2	4	

Event code	Context	Count	Weight (g)	Comments *
ARC 330 98	713	2	4	
ARC 330 98	840	1	37	
ARC 330 98	458	2	9	
ARC 330 98	862	8	6	
ARC 330 98	836	4	11	
ARC 330 98	771	7	80	
ARC 330 98	844	5	18	
ARC 330 98	875	3	39	
ARC 330 98	736	3	6	
ARC 330 98	944	4	41	
ARC 330 98	689	4	34	
ARC 330 98	873	2	28	
ARC 330 98	676	5	17	
ARC 330 98	1177	2	7	
ARC 330 98	638	2	10	
ARC 330 98	832	2	10	
ARC 330 98	990	3	4	
ARC 330 98	823	4	16	
ARC 330 98	402	10	299	
ARC 330 98	949	3	13	
ARC 330 98	1047	3	7	
ARC 330 98	691	9	75	
ARC 330 98	771	13	121	
ARC 330 98	939	2	49	
ARC 330 98	726	5	7	
ARC 330 98	982	4	26	
ARC 330 98	812	14	407	
ARC 330 98	401	99	758	
ARC 330 98	867	34	5281	
ARC 330 98	908	3	1	
ARC 330 98	754	18	59	
ARC 330 98	450	3	34	
ARC 330 98	576	1	3	
ARC 330 98	615	3	19	
ARC 330 98	807	5	23	
ARC 330 98	1193	18	24	
ARC 330 98	1150	1	3	
ARC 330 98	980	2	31	
ARC 330 98	710	150	2681	
ARC 330 98	412	125	2926	
ARC 330 98	712	5	8	
ARC 330 98	741	38	652	
ARC 330 98	390	44	1407	
ARC 330 98	143	1000	2778	
ARC 330 98	835	7	557	
Total		1651	35955	

* all heavily calcined white to grey

APPENDIX 5: ASSESSMENT OF STONE (HUMANLY-MODIFIED AND UNWORKED)

Jackie Keily

1. Introduction

1.1 Five stone artefacts were recovered from ARC 330 98 in Zone 4.

1.2 The stone accessions were recovered by hand excavation.

1.3 The stone artefacts may assist the following fieldwork event aim:

- To determine the form, function and chronology of occupation

2. Methodology

2.1 The stone artefacts were accessioned in accordance with the Museum of London system.

2.2 The records have been entered onto the Oracle relational database and transferred to RLE Datasets

2.3 No sampling of the accessioned stone artefacts was undertaken.

3. Quantifications

Table 15: Assessment of Stone (Humanly-Modified and Unworked) from ARC 330 98

Context	Count	Material	Comments [brief description: form/ type/ decoration/ working presence]
1186	1	Stone	<46> Small flint sphere; naturally occurring
373	1	Stone	<85> Hone; a fragment of stone with two worn surfaces and two very worn edges; used as a smoothing or polishing stone.
633	1	Stone	<82> Quern; five fragments of a lava stone quern; probably Niedermendig lava. All are worn and abraded and no original surfaces remain.
1186	1	Stone	<59> Smoothing stone? A small fragment with one smoothed surface
666	1	Stone	<108> Quern; part of a large saddle quern found with a group of Sarsen stones; probably late prehistoric in date

4. Provenance

4.1 The naturally occurring small stone sphere and the possible smoothing stone fragment came from [1186] sub-group 4087, the fill of prehistoric storage pit [1172] (Figure 6). The hone came from [373] sub-group 4082, the fill of prehistoric pit [374] (Figure 7). The fragmentary lava stone quern came from

[633] sub-group (4120), the fill of a Roman dew pond [630], which also produced fragments of later prehistoric pottery (Figure 9). The large saddle quern <108> [666] was found associated with the group of sarsen stones which may be the remains of a megalithic monument (Figure 9).

4.2 Most of the artefacts are fragmentary but all are in a stable condition.

5. Conservation

5.1 No conservation treatment is required.

5.2 All of the stone types will require identification but this is unlikely to damage the artefacts in any way or to conflict with their long term storage.

5.3 The naturally occurring flint sphere may be discarded; the remaining stone artefacts should be retained for further research.

6. Comparative material

6.1 The material should be compared with other material from sites in the vicinity.

6.2 The saddle quern is of particular interest. It was identified as a saddle quern by Jon Cotton and this has been confirmed by Philippa Bradley. Saddle querns are large stones with a flattened surface upon which grain was ground with a smaller stone. Saddle querns date from the Neolithic through to the Roman period. The present example was found still set in the ground (ie *in situ*), in close proximity to a group of sarsens and it is of the same stone type. This indicates two possibilities. Firstly, that the saddle quern was used at the same period as the possible megalithic monument or secondly, that it is one of the monument's stones removed at a later date (possibly the later Bronze Age/Iron Age) for reuse as a quern. Further work is required on the form of the saddle quern (initial comparisons indicate that it is unusually large) and comparison should be made with published quern assemblages.

6.3 The lava stone quern fragments almost certainly date to the Roman period and were found in the fill of a Roman pond. Lava stone querns were commonly used in the Roman period and are frequently found on Roman sites in south-east England.

6.4 The stone types of all the accessioned stone artefacts will require identification and this will allow them to be analysed further in terms of trade. The stone assemblage should be compared to others from the surrounding area.

7. Potential for further work

7.1 The accessioned ceramic finds have potential to assist with the following landscape zone aim:

- *The socio-economic landscape of the later agriculturalists (2000-100BC)*

7.2 The stone accession with the most potential for this landscape zone aim is the saddle quern. Saddle querns were used from the Neolithic through to the Roman period. The Zone 4 example was found associated with a group of sarsens, thought to have formed part of a megalithic monument. It may have been used at the same period as the possible megalithic monument or may be one of the monument's stones removed at a later date (possibly the later Bronze Age/Iron Age) for reuse as a quern. Further work is required on the form of the saddle quern and comparison should be made with published quern assemblages.

7.3 The stone artefacts may assist the following fieldwork event aims:

- *To determine the form, function and chronology of occupation*

The stone assemblage is small but the artefacts provide further evidence for human occupation and activity in the area. Their exact dating is, at present, unclear. It is hoped that with further integration of the accessioned finds, the stratigraphy and the pottery dating that their place within the context of the site and the processes going on there, will become clearer. Since stone querns and other artefacts were often traded over long distances it is hoped that some of the stone artefacts may be able to inform about trade patterns. The saddle quern and its relationship to the possible megalithic monument will require further analysis.

7.4 The following work is required:

- Identification of the stone types of three artefacts
- Integration of the finds and stratigraphic information
- Stone artefact catalogue
- Comparative work with similar assemblages
- Specialist to investigate the saddle quern
- Text
- It is estimated that *c* 3 illustrations will be required.

8. Bibliography

None

APPENDIX 6: ASSESSMENT OF METALWORK

Jackie Keily
Conservation by Liz Barham

1. Introduction

1.1 Nine metal artefacts were found; all are iron.

1.2 All of the artefacts were recovered by hand excavation or metal-detection.

1.3 The following fieldwork event aims may be addressed by the accessioned finds:

- To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established
- To determine the form, function and chronology of occupation

2. Methodology

2.1 The metal finds were accessioned in accordance with the Museum of London system.

2.2 The records have been entered onto the Oracle relational database and have been transferred to RLE Datasets.

2.3 No sampling of the metal accessions was undertaken.

3. Quantifications

Table 16: Assessment of Metalwork from ARC 330 98

Context	Special Number	Material	Count	Period	Comments (Description)
373	66	Iron	3	PR	2 x narrow shafts – nails?; 1 x triangular fragment – arrowhead/spear tip? Conservation to clean
373	90	Iron	2	IA	Brooch (in two pieces) with a straight bow; probably a La Tène I, 'Swallowcliffe' type (Hattatt 1985, 10-1). This, however, would date the brooch to the 3rd century BC, later than the pottery from the context. More work required on the identification of this brooch. Conservation to do investigative cleaning
741	25	Iron	2	PR?	A plain open ring; one end is broken and the other end turns outwards at a right angle to the ring; function?

Context	Special Number	Material	Count	Period	Comments (Description)
538	76	Iron	2	UN	Possible arrowhead? Very corroded; clean? ?; found with abraded Roman pottery (AD 120-300)
811	33	Iron	1	UN	Swivelling fitting; ring with a hooked nail attached
863	48	Iron	1	UN	Part of a flat strip with its long edges turned up at right angles to it; part of a fitting for something.
988	57	Iron	2	UN	Two joining flat fragments
862	47	Iron	1	UN	Long tapering bar
1149	24	Iron	3	UN	Two lumps of slag and a possible nail.

4. Provenance

4.1 Most of the metal finds were recovered from pits:

- <66> and <90> [373] (sub-group 4082), fill of prehistoric pit [374] (Figure7)
- <25> [741] sub-group 4085, fill of prehistoric pit [740] (Figure 6)
- <48> [863] sub-group 4207, fill of Roman pit [861]
- <47> [862] sub-group 4207, fill of Roman pit [861]
- <24> [1149] sub-group 4125, fill of medieval pit [1148] (Figure 9)

4.2 The only finds not to come from pits were:

- <76> [538] sub-group 4166, fill of Roman well cut [539] (Figure 10)
- <33> [811] sub-group 4104, fill of post-medieval ditch [810] (Figure 8)
- <57> [988] sub-group 4193, Roman trackway [933] wheel rut in [990] (Figure 10)

4.3 All of the iron was in a very corroded state and, for the most part, could only be identified with the aid of X-radiography.

5. Conservation

5.1 This assessment considers requirements for finds analysis, illustration and investigative conservation of the metal finds from CTRL Area 330 Zone 4. It also includes work necessary to produce a stable archive in accordance with MAP2 (English Heritage 1992), and to the level required by the Museum of London's standards for archive preparation. (Museum of London 1999).

5.2 Treatments are carried out under guiding principles of minimum intervention and reversibility. Whenever possible, preventative rather than interventive conservation strategies are implemented. Procedures aim to obtain and retain the maximum archaeological potential of each object.

5.3 All conserved objects are packed in archive quality materials and stored in suitable environmental conditions. Records of all conservation work are

prepared on paper and on the Museum of London collections management system and stored at the Museum of London.

5.4 Investigative cleaning has been requested for three items [373] <66>, [373]<90> and [538]<76> to assist with their identification. The X-radiograph suggests that some consolidation of [373]<90> and [538]<76> may be necessary during cleaning, particularly as they have been recommended for illustration. It may also be necessary to apply a tannic acid solution corrosion inhibitor to these finds, post cleaning.

5.5 One item [811]<33> requires a gap-fill to protect it from physical damage.

5.6 All the metal items are stable and packed appropriately for long term storage.

6. Comparative material

6.1 The material was recovered from features ranging in date from the prehistoric to the medieval, with the majority dating to the prehistoric and Roman periods. The material from the prehistoric contexts, particularly the possible arrowheads and ring fittings, should be compared with other sites of a similar date range (for example, Meare Village East, Somerset & Danebury, Hampshire).

6.2 The La Tène brooch is of particular interest and is nearly complete. It is very corroded but investigative cleaning by the conservation department may be able to identify further features on it. It is similar to examples illustrated by Hattatt (1985, 11, fig 3, nos 219 & 224) and dates generally to the 4th to 3rd centuries BC. The terminal is missing but the bow, pin and spring appear to be complete (the pin is in two pieces). The straight bow may indicate that this is a 'Swallowcliffe' type of La Tène brooch, a type which dates to around the mid-3rd century BC on, but this identification will need to be confirmed once the brooch has been cleaned. Further research is required to try and refine the dating.

6.3 Comparison should be made with the finds assemblages from the other surrounding sites to see what other material dating to this period has been found and what activity it may relate to. Comparison should also be made with other CTRL Iron Age assemblages in the area to see if this type of brooch is a common type of find in this area (for example Area 330 Zone 3).

7. Potential for further work

7.1 The metalwork assemblage is quite small and therefore, its potential is limited, however, the following fieldwork event aims may be addressed:

- *To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established*

7.2 The brooch is of use for dating purposes and it is hoped that it may be possible to refine its dating after investigative cleaning by the conservation department. Comparison with other dated assemblages from similar sites may be able to aid the identification and dating of a number of the accessioned finds.

- *To determine the form, function and chronology of occupation*

7.3 A number of the finds, such as the rings, may come from household fittings or horse harness. The possible arrowheads and the brooch may also be able to add to an overall understanding of the form and function of the occupation at the site.

- *The character, function and development of the Roman rural urban fringe*

7.4 A number of accessioned finds were recovered from features dating to the Roman period but the only identifiable object is the possible arrowhead. The object will require further work before it can be identified and dated more precisely.

7.5 The following further work is recommended:

- Further analysis of the brooch after cleaning by conservation; and research on its form
- Further analysis of the two possible arrowheads, after cleaning by conservation
- Comparative work on the remaining accessioned finds
- Finds catalogue
- Finds text
- Conservation

7.6 The following objects are recommended for illustration:

- The brooch
- Potentially the two arrowheads
- The two ring fittings (depending on dating)

8. Bibliography

Hattatt, R, 1985 *Iron Age and Roman Brooches*, Oxford

English Heritage 1992 *Management of Archaeological Projects II*

Museum of London 1999 *General standards for the preparation of archaeological archives to be deposited with the Museum of London*

APPENDIX 7: ASSESSMENT OF COINS

Jackie Keily (coin identifications by Mike Hammerson (Roman) and Geoff Egan (post-Roman))
Conservation by Liz Barham

1. Introduction

1.1 Two coins were recovered from ARC 330 98 in Zone 4. A very corroded Roman copper alloy coin can only be identified as a *sestersius*, probably dating to AD40-180 came from chainage 43+020. A Nuremberg jetton, dating to between the last quarter of the 16th century to *c* 1635, came from chainage 41+160.

1.2 The coins were recovered by metal detection.

1.3 The coins have little to contribute to the fieldwork event aims, except in terms of dating.

2. Methodology

2.1 The coins have been accessioned using the Museum of London system.

2.2 The records have been entered into the Oracle relational database and have been transferred to RLE Datasets.

2.3 No sampling of the coins was undertaken.

3. Quantifications

Table 17: Assessment of Coins

Context	Special Number	Count	Period	Comments
Chainage 43+020-43+720	27	1	RO	Copper alloy; corroded; *sestersius* dating to ?AD40-180?
Chainage 41+160	3	1	PM	Copper alloy; Nuremberg jetton of Hans Krauwinckel dating to between the last quarter of the 16th century to 1635

4. Provenance

4.1 Both of the coins came from chainage contexts and so are at present unstratified.

5. Conservation

5.1 Both of the coins have been X-rayed and conserved.

5.2 Both of the coins are to be retained.

6. Comparative material

6.1 There is little scope for comparative work.

7. Potential for further work

7.1 The jetton requires further work to refine its dating.

7.2 The coins cannot assist the Landscape Zones Aims or the Fieldwork Event Aims but may of use for dating purposes.

8. Bibliography

None

APPENDIX 8: ASSESSMENT OF GLASS

Jackie Keily
Conservation by Liz Barham

1. Introduction

1.1 Only one glass accession came from archaeological work in Zone 4. A small spherical bead in light blue glass was recovered from chainage 41+040 (Figure 3a).

1.2 The glass bead was recovered during targeted machine monitoring.

1.3 The glass bead is of uncertain date and therefore has little to contribute to the fieldwork event aims.

2. Methodology

2.1 The glass bead was accessioned in accordance with the Museum of London system.

2.2 The records were entered onto the Oracle relational database and have been transferred to RLE Datasets.

2.3 The glass itself has not been sampled.

3. Quantifications

Table 18: Assessment of Glass from ARC 330 98

Context	Count	Type	Period	Comments (Description)
Chainage 41+040	1	Bead	PM	<92> Small complete spherical bead in light blue glass.

4. Provenance

4.1 The glass bead is basically unstratified, coming from chainage 41+040, ARC 330 98. No other dating evidence is available for the context.

5. Conservation

5.1 The glass bead is in a stable condition and no conservation treatment is required.

5.2 The glass bead is to be retained as part of the site archive, and particularly since no other dating evidence was recovered from the context.

6. Comparative material

6.1 There is no requirement for comparative work.

7. Potential for further work

7.1 There is no potential for further work.

8. Bibliography

None

APPENDIX 9: ASSESSMENT OF CERAMIC ARTEFACTS

Jackie Keily
(identifications by Louise Rayner)
Conservation by Liz Barham

1. Introduction

1.1 Three accessioned finds were recovered from the watching brief excavations ARC 330 98 in Area 330 Zone 4.

1.2 All of the accessions were recovered by hand excavation.

1.3 The accessioned ceramic finds can assist the following fieldwork event aims:

- To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established.
- To determine the form, function and chronology of occupation.

2. Methodology

2.1 The ceramic finds were accessioned in accordance with the Museum of London system.

2.2 The records have been entered onto the Oracle relational database and transferred to RLE Datasets.

2.3 No sampling of the ceramic accessions was undertaken.

3. Quantifications

Table 19: Assessment of Ceramic Artefacts from Area 330 Zone 4

Context	Special Number	Material	Count	Period	Comments (Description)
529	79	Ceramic	3	LBA	Perforated clay slab; all three fragments join and include one right-angled corner, the beginning of a rounded edge and part of one perforation.
529	107	Ceramic	3	LBA	Perforated clay slab; the fabric has fewer and larger flint fragments; the largest fragment has the remains of a perforation.
529	106	Ceramic	12	LBA	Perforated clay slab; remains of one corner and possibly two perforations.

4. Provenance

4.1 The perforated clay slabs all came from [529] (sub-group 4173) the fill of pit 537 (Figure 10). This context also produced Later Bronze Age pottery dating to 1150-800BC.

4.2 The material is quite a soft, fired ceramic and is, therefore, quite fragile and friable.

5. Conservation

5.1 The artefacts are stable and packed appropriately for long term storage.

5.2 The ceramic artefacts should be retained for further analysis and research.

6. Comparative material

6.1 This is a small but very important assemblage of Bronze Age artefacts. Middle-Late Bronze Age settlements in Kent are, at present, poorly understood (URL 1998, 42-3; Mudd 1995, 406). It is recommended that the material is compared to other, similar sites, for example Area 330 Zone 5 (ARC CGC 98) and those found in Sussex (Black Patch, Patcham Fawcett, Varley Halls, Itford Hill (URL 1998, 42-3)) and Essex (for example, Mucking).

7. Potential for further work

7.1 The accessioned ceramic finds have potential to assist with the following landscape zone aim:

- *The socio-economic landscape of the later agriculturalists (2,000-100BC)*

7.2 The ceramic accessions are late Bronze Age in date and are typical of assemblages found on other sites of this period (see 6.1 above).

- *To recover dating evidence from the features located to enable a chronology for the division of the landscape to be established.*

7.3 Perforated slabs are quite commonly found on sites dating to the later Bronze Age (Bond 1988, 39). In Zone 4 they were found in a pit with pottery which also dates to the late Bronze Age.

- *To determine the form, function and chronology of occupation.*

7.4 The occurrence of the three fragmentary perforated slabs is of interest as they indicate a Bronze Age settlement in the vicinity. The function of these objects is unknown, although it has been suggested that they were used in some form of 'cottage industry' (Perkins 1995, 311). Perkins has suggested that they may have been used in bronze melting furnaces (ibid, 311-2) but the lack of vitrification would seem argue against this. Other uses that have been suggested for them include cooking and salt production.

7.5 The following further work is required:

- Confirmed identification of fabrics
- Catalogue for publication
- Comparison with similar assemblages
- Text
- The three perforated clay slab accessions should be illustrated

8. Bibliography

Bond, D, 1988, 'Perforated clay slabs' in D, Bond *Excavation at the North Ring, Mucking, Essex: A Late Bronze Age Enclosure*, East Anglian Archaeology Report No. 43, 1988, 39

Perkins, D R J, 1995, 'The deposition of the Monkton bronze hoards and the 'perforated clay plaque'' in D R J. Perkins, N. MacPherson-Grant & E. Healey *Monkton Court Farm evaluation, 1992*, Archaeologia Cantiana, Vol. CXIV (1994), 311-2

Mudd, A, 1995, '*The excavation of a Later Bronze Age site at Coldharbour Road, Gravesend*', Archaeologia Cantiana, Vol. CXIV (1994), 363-410

APPENDIX 10: ASSESSMENT OF WORKED BONE

Jackie Keily

1. Introduction

1.1 Two accessioned antler finds were recovered from the excavation ARC 330 98 in Zone 4.

1.2 All of the accessions were recovered by hand excavation.

1.3 The accessioned antler finds can assist the following fieldwork event aims:

- To determine the form, function and chronology of occupation.

2. Methodology

2.1 The two antler finds were accessioned in accordance with the Museum of London system.

2.2 The records have been entered onto the Oracle relational database and transferred to RLE Datasets.

2.3 No sampling of the antler accessions was undertaken.

3. Quantifications

Table 20: Assessment of Antler Artefacts from Area 330 Zone 4

Context	Special Number	Material	Count	Period	Comments (Description)
566	110	Antler	1	LPR?	Handle; a fragment of antler with some trimming along its length; one end is slightly rounded and the other has a small central hole.
741	109	Antler	1	EIA?	Waste; a small off-cut from antler working with one cut edge.

4. Provenance

4.1 The antler waste fragment <109> came from [741] sub-group 4085, fill of prehistoric pit 740 (Figure 6), which also produced prehistoric pottery dating to the Early Iron Age (*c* 500-300BC). The handle <110> is from [566] sub-group 4083, fill of pit [435], which contained later prehistoric pottery (Figure 7).

4.2 The material is in a stable condition.

5. Conservation

5.1 The artefacts are stable and packed appropriately for long term storage.

5.2 None of the antler accessions should be discarded.

6. Comparative material

6.1 This is a small but interesting assemblage. Both artefacts indicate antler-working, probably on a small, localised scale. The handle is of particular interest and will require further work to find parallels for it. Similar objects have been found at other Iron Age sites (for example, Meare Village East (Coles 1987, 88)). Relatively few bone or antler artefacts were recovered during the CTRL work. Area 330 Zone 3 produced a fragment of bone-working waste and two artefacts, all dating to the Iron Age.

7. Potential for further work

7.1 The accessioned antler finds have potential to assist with the following landscape zone aim:

- *The socio-economic landscape of the later agriculturalists (2,000-100BC)*

7.2 The accessions indicate antler working in the vicinity of the site and are further evidence of the types of activity undertaken by the local community in the later prehistoric period.

7.3 The accessioned antler finds can assist the following fieldwork event aims:

- *To determine the form, function and chronology of occupation.*

7.4 The antler finds can add to the understanding of the function of occupation as they are indicative of a probably small, localised activity. Parallels will be sought for the form of the partly made handle and this may be able to indicate what type of implement it was intended for. Both the objects add to the general understanding of the types of activities that were undertaken by the populace at this time and may also contribute to analysing the types of implements being used by them.

7.5 The following further work is required:

- Catalogue for publication
- Comparison with similar assemblages
- Text
- It is recommended that both the antler accessions are illustrated.

8. Bibliography

Coles, J, M, 1987, *Meare Village East; the excavations of A. Bulleid and H. St. George Gray 1932-1956* Somerset Levels Papers no. 13

APPENDIX 11: ASSESSMENT OF ANIMAL BONE

Alan Pipe and Kevin Rielly

1. Introduction

1.1 Animal bones were recovered during excavation works at the Watching Brief sites ARC 330 98.

1.2 Animal bones were recovered by hand-collection on site and through wet-sieving bulk samples taken in the field. All hand-collected animal bones were washed and air-dried, then bagged and labelled as context groups. Bulk samples were washed using a modified Siraf tank fitted with 1.0mm and 0.25mm flexible nylon mesh to retain the residue and flot fractions respectively. These fractions were visually sorted for floral and faunal remains and labelled as individual sample groups.

1.3 The study of the material was carried out to study the following fieldwork event aims,

- to establish changes in the local environment through the recovery of suitable palaeo-environmental samples from the fills of cut features.
- to investigate patterns of natural resource exploitation through the recovery of economic indicators such as faunal and charred plant remains.

2. Methodology

2.1 All contexts containing faunal remains were analysed and recorded onto the Oracle CTRL animal bone database (RLE Dataset). No sub-sampling of contexts was carried out.

3. Quantifications

3.1 A total of 5.90kg, approximately 520 fragments, of animal bones were hand recovered from 57 contexts, and an additional 0.24kg or 270 fragments, from 44 soil samples. Amongst the hand collected assemblage, 305 fragments were identifiable to species and body part. This included 82 bones with potential for ageing data, 12 that can be measured and nine showing evidence of butchery. There were also two examples of worked bone. The samples provided 46 identifiable bones. The combined information from the site assemblage organised by feature and date, along with the data drawn from a selection of contexts are given in the tables below.

3.2 The last table shows the percentage of identifiable fragments represented by each of the specified species groups. The representative sample of context assemblages within this table clearly show a general dominance of the major domesticates, cattle, sheep/goat and pig. In addition the data shows that the predominant species in most cases is sheep/goat.

4. Provenance

4.1 Most of the bone material was in a generally moderate to good condition, here referring to the surface condition of the bone fragments. There were only six assemblages where the overall condition was poor. These few contexts offer no discernible pattern (spatial or temporal) to explain their poor condition. Fragmentation was generally low to moderate. Here, fragmentation is divided into three size categories, where 'low' describes an assemblage where the majority of bones are at least 75mm in length. It can be suggested that the bones from this area were generally in better condition than those from the other chainage zone watching brief excavations (ARC 330 98 within Zones 1 to 3, and 5). This is also shown by the good representation of identifiable bones and the fact that these bones are represented by a wide range of skeletal parts. It was noticeable within these other areas that most of the identifiable bones were teeth, a sure sign of advanced fragmentation.

4.2 Animal bones were found within a variety of deposits, the majority arising from pitfills, with lesser quantities from ditches, a well, a trackway, a hearth and then from a few layers (unconnected to deep features). The dating is generally good, although certain features did provide deposits dating to different periods, and also there are a number of undated deposits. Overall, the date range covers the Late Bronze Age through to the early medieval period - up to the 13th century AD. There is a possibility of some post-medieval occupation/use, but no such dating could be connected, at the time of writing, with the bone bearing deposits.

4.3 Most of the pitfill assemblage was recovered from 10 pits dated to the Late Bronze Age/Early Iron Age period. Well over 75% of these bones were taken from just 5 of these pits, including a large quarry pit and two others [1172] and [1174] (Figure 6). In general, these pit assemblages were dominated by the domestic mammals, in the order of sheep/goat followed by cattle and then pig. A notable feature of these domesticates is the relatively good representation of very young individuals, with one example of a young lamb and two examples of young calves. These are likely to represent infant mortalities, here providing clear evidence for the local rearing/breeding of domestic stock. Other species include a small quantity of horse bones and three deer fragments. The latter include food waste, a roe deer tibia, and two red deer antler fragments, one of which clearly represents working waste (see Appendix 10). The horse bones could represent food waste. One of these, a pelvis, shows a clear butchery mark, undoubtedly made by a heavy metal instrument.

4.4 The samples taken from these early pits provided relatively small assemblages. These confirmed the dominance of sheep-sized domesticates. The quantities were rarely sufficient to allow for a valid proportional comparison of sheep/goat or pig, although it was very clear that sheep rather than cattle-size fragments were predominant. These samples produced a small number of additional species/species groups, including bird (not identifiable) and amphibian (with potential for identification).

4.5 Two of these pits (from a total of four deposits) produced considerable quantities of small rodent bones (see those contexts with high proportions of small mammal). The rodents were identified from their skulls/mandibles (Lawrence and Brown, 1973) as field vole and wood mouse, with at least six individuals (3 voles and 3 mice) from one fill and another three individuals (with one identified as vole) from the other fill. It can be conjectured that these rodents may represent

the remains of owl pellets or that they fell into open features which acted as pit-fall traps.

4.6 Relatively small bone assemblages were recovered from the few pits dated between the early Iron Age and early Roman occupation periods. In all cases, as with the earlier pitfills, there is a clear dominance of the major domesticates. The quantities of identifiable bones within these deposits were generally insufficient to warrant any valid pronouncements on the representation of these domesticates. However, one late Iron Age/early Roman pitfill, did produce a reasonable assemblage, 20 identifiable bones, which was clearly dominated by sheep/goat. The other species present amongst these pitfills, include horse, red deer and vole, all from early Iron Age features. The vole represents the single identified bone from the few samples taken from these later prehistoric and Roman pitfills. Notably, deer are represented by a sawn antler fragment.

4.7 The medieval pits provided a small number of moderately sized bone assemblages. Within the ubiquitous dominance of the major domesticates, it is perhaps interesting to see a continuation of the predominance of sheep/goat. As with the earliest pitfills, there is again evidence of local production, here shown by the presence of an infant lamb shoulder blade. The other species represented within the hand collected assemblages are horse and roe deer. Unlike the majority of the deer remains found elsewhere, this animal is clearly represented by a food waste item, a tibia (shin bone). The samples mainly produced unidentifiable sheep-size fragments, although one did produce a sheep/goat and a pig bone, while another provided a mix of species, including, fish, amphibian, small mammal and pig. The fishbones were identified as gadid (cod family) and eel. Notably, this latter deposit is the only dated feature found at this site which produced fishbones (Figure 10).

4.8 As mentioned above, bones were found within a variety of other features, as well as pits. In the prehistoric period, a small quantity of bones was recovered from a single Late Iron Age ditch (from a sample) and also from a sump dated to the same period. Neither assemblage provided any identifiable fragments.

4.9 Most of the Roman assemblage, not counting that associated with the Late Iron Age, was recovered from a variety of other features, including two ditches, a well and a trackway. Each of these features provided a few bones, with identifiable fragments limited to the well and trackway, represented by two sheep/goat and one horse bone respectively.

4.10 The remaining medieval assemblage, similarly dated to the pitfills, was recovered from the fills of three sections of boundary ditches. These produced a very small number of bones with a handful of identifiable fragments, composed of a mixture of sheep/goat and cattle fragments.

4.11 A relatively large proportion of the site assemblage remains undated. This includes bones from a variety of feature types. Here it is worth mentioning the contents of two of these features. A sample taken from a pitfill [161] (Figure 11) provided a small collection of fishbones, including gadid (cod family), eel and clupeid (herring/sprat). As there is a distinctly poor representation of deposits at this site with fishbones, it is of paramount importance that some dating evidence is found for this deposit. The second feature, a hearth, provided a few bones, all of which are calcined. The condition of these bones can be used as an aid to the interpretation of other calcined assemblages recovered at this site (see below).

4.12 Finally it should be mentioned that there is a general scatter of burnt bones throughout the site deposits (in addition to the hearth assemblage described above), with a concentration within the prehistoric features. Some of these are merely charred, while others have become calcined. Small concentrations of calcined bones were found, most notably from the Late Bronze Age/Early Iron Age pitfill [401] and the Late Iron Age ditchfill [555]. Each of these fills provided small assemblages which are entirely composed of calcined animal bone fragments. A possible ritual association cannot be discounted. Obviously they do not represent the remains of human cremations. While they may represent the cattle or sheep ritual equivalent, their similarity to the bones from the aforementioned hearth, would strongly suggest that they are more likely to be the remains of hearth sweepings.

5. Conservation

5.1 It is recommended that all material be retained for the next stage of analysis and for future comparative work.

6. Comparative material

6.1 Any comparisons will clearly have to take into account the relative quantity of bones from the respective occupation periods. At this site, most of the bones were recovered from the Late Bronze Age/Early Iron Age and early medieval periods. The nearest and perhaps largest assemblages dating to these periods, within the North Kent area, include those excavated as part of the present project. Moderately sized late Bronze Age/early Iron Age and medieval assemblages were recovered from a series of features, mainly pits, within the Hazells Farm site and Hazells road/Northumberland Bottom sites respectively (Area 330 Zone 3), while a relatively large medieval assemblage was excavated from Parsonage Farm on the CTRL.

6.2 Further comparisons could include the bones recovered from the Iron Age farmstead at Farningham Hill in the Darent Valley (Locker 1984. 71), and, though somewhat distant, the very large Bronze Age assemblage recovered from Runnymede.

7. Potential for further work

7.1 This excavation provided a moderately sized bone assemblage which is clearly in good condition and generally well dated. The late Bronze Age/early Iron Age and medieval collections are clearly the major components of this assemblage, and each of these provided reasonable quantities of age and size data. There is therefore, at least regarding these two periods, some potential for further analysis. This analysis should follow the recording of a range of aspects within each of the chosen assemblages, including the state of the bones (fragmentation and preservation), species, skeletal part, age (epiphysis fusion and mandible tooth eruption and wear), sex and size data. It would be appropriate to record this data onto a database, as for example that used at the Museum of London Archaeology Services incorporating Oracle. The analysis will then proceed with the intention

of describing any species differences between the major periods, as well as any changes in exploitation patterns (this based on a review of the age and sex data) and also any changes in size. The latter two analyses will almost certainly be limited to the major domesticates ie cattle, sheep/goat and pig.

7.2 The questions/aims asked in the introduction to this report are concerned with economic and environmental indicators. Turning first to the economic question, there are sufficient quantities of bones throughout the prehistoric (including the Late Iron Age/Early Roman levels) and medieval deposits to suggest which animals were used. Notably, samples were taken, to a lesser or greater extent, from each period. Thus it can be suggested that the species representation is unlikely to be biased against the smaller species. The evidence for exploitation strategies (age information) is best represented amongst the assemblages from the earliest and latest occupation levels. Here it should be possible to suggest how the individual domestic species were exploited and whether on an extensive or intensive basis.

7.3 The setting of the site, the presence of domesticates and other work/food animals (such as horses), would strongly suggest a continuation of a small rural community. There is certainly evidence that it was a production site, at least during the late Bronze Age/Early Iron Age and the medieval periods. There is no clear indication, at least from the present analysis, of the status of these communities. Deer remains can often be viewed as the remains of high status foods, although this interpretation is perhaps best used either within an urban setting, reflecting the difficulty of obtaining such foodstuffs, or within a medieval community where hunting was generally viewed and, indeed, kept, as a pastime for the more affluent members of society. Notably, one roe deer fragment was recovered from a medieval deposit, which may be indicative of high status. However, this conclusion cannot be viewed as absolute when it is dependent on just one bone. It is unfortunate that the Roman levels produced so few bones. A possible indicator of status here would have been the proportion of cattle against sheep/goat and pig. A high count of cattle is generally taken to mean a greater level of Romanisation and, by inference, a higher level in local society.

7.4 Of some interest regarding the species used during these periods, is the food use made of the horse from the earliest levels and the apparently very poor representation of fish, this only appearing within the medieval levels. It is well known that horses were valued food items during the Iron Age in this country (Maltby 1981. 184), and indeed the single example may date to this period. Any further analysis of the horse bones, from the prehistoric levels, should aim to closely examine the other bones for butchery marks. The absence/lack of fishbones would appear to be a common trait of prehistoric sites (Serjeantson pers comm), which would appear to be deliberate.

7.5 The possible connection between deer and status, at least in the medieval period, was mentioned above. Overall, the presence of such animals would perhaps suggest the use of local resources, with perhaps the intention being to supplement the general domestic diet as well as to provide some raw materials for craft purposes. Note the presence of antler (worked and unworked) within the earlier periods. It can certainly be imagined that most of the meats used by these communities were derived from local sources, principally the surrounding farmland, of which these sites were a part. These could also include the fish represented within the medieval levels, where the gadidae (cod family) may have derived from the Medway estuary and the eels from a local river. Conversely the

estuarine fish may have been caught somewhat further afield, and these may then represent evidence of imported foodstuffs.

7.6 There is also some potential for study of evidence concerning the local environment. A notable aspect of the prehistoric assemblage, and indeed the medieval assemblage, was the good representation of sheep. This would clearly suggest the local availability of suitable pasturage. In addition, there is a good representation of cattle throughout these period assemblages. Such animals were generally used as the major beast of burden, including their use as plough animals. Thus, the proportion of cattle can be used to roughly gauge the proportion of the local area which had been turned over to arable land.

7.7 It was noted that two of the late Bronze/early Iron Age pits provided copious quantities of small rodent bones. As these are identifiable to species, eg wood mouse and field vole, there is an obvious potential for determining the nature of the environment within this local area during this period. These pits also produced a few amphibian bones, which are potentially identifiable to species and so these could also add further data to the environmental interpretation.

7.8 There is one obvious addition to the above noted research aims/objectives. This concerns the analysis of the size and/or type of domesticates exploited. Notably, the two largest assemblages, and in particular that from the earliest level, provided a large number of measurable bones.

8. Bibliography

Lawrence, MJ and Brown, R W, 1973, *Mammals of Britain: Their tracks, trails and signs*. London.

Maltby, M, 1981, 'Iron Age, Romano-British and Anglo-Saxon animal husbandry - a review of the faunal evidence. In M. Jones and G. Dimbleby (eds). The environment of Man: the Iron Age to the Anglo-Saxon period' *B.A.R. British Series 87. 155-203.*

Table 21: Distribution of Animal Bones in Area 330 Zone 4 by period and feature type

Feature/ Interpretation	**Period**	**Hand collected**			**Sieved**		
		N.cont	N.	Wt	N.Samp	N	Wt
Pits	LBA	29	317	3.192	24	127	0.179
	EIA	3	24	0.536	3	30	0.013
	LIA	2	11	0.14			
	LIA	2	34	0.391	1	5	0.001
	RO	1	1	0.01			
	MD	5	63	0.599	5	23	0.016
	UN	4	40	0.392	2	55	0.026
Ditches	RO	1	6	0.02			
	LIA				1	2	0.001
	RO	1	1	0.03			
	MD	2	5	0.09	3	10	0.004
	UN	1	2	0.344	1	3	0.001
Well	RO	1	2	0.02			
Trackway	RO	1	1	0.03			
Hearth	UN				1	10	0.001
Other	LIA	1	10	0.02			
	LIA/RO				1	2	0.001
	UN	2	2	0.03	1	1	0.001

N.cont number of contexts, N.Samp. number of samples, N approximate number of bones, Wt weight (in kilograms)

Table 22: Quantities of Identified Bones, and age and size data

Hand collected bones only.

Period	**N.bones**	**N.iden**	**N. Ageable**	**N. Meas**	**N. Butch**	**N.Worked**
LBA	317	199	47	5	7	2
EIA	24	19	5	1	0	1
LIA	11	4	3	0	0	0
LIA/RO	34	20	5	0	0	0
RO	1	0	0	0	0	0
MD	69	48	16	4	1	0
UN	40	5	3	2	1	0

N - approximate number of bones. Iden - bones identifiable to species/species group

Table 23: Assessment of Animal Bone – species, quantity and interpretation for a selection of context assemblages

Organised by date and feature type.

Context	**S.No**	**Interpretation**	**Period**	**% of identified fragments**									**Count**	**Weight**
ARC 330 98				Sheep goat	Cattle	Pig	Horse	Dog	Small mammal	Bird	Fish	Other		
373	0	Pit	LBA/EIA	60	30	10	0	0	0	0	0	0	40	0.65
373	82	Pit	LBA/EIA	0	0	0	0	0	0	0	0	100	5	0.003
352	0	Quarry pit 372	LBA/EIA	50	50	0	0	0	0	0	0	0	10	0.25
352	81	Quarry pit 372	LBA/EIA	0	0	0	0	0	0	0	0	0	2	0.003
385	0	Quarry pit 372	LBA/EIA	80	20	0	0	0	0	0	0	0	8	0.17
386	0	Quarry pit 372	LBA/EIA	60	40	0	0	0	0	0	0	0	15	0.38
386	89	Quarry pit 372	LBA/EIA	0	0	0	0	0	50	50	0	0	12	0.01
389	0	Pit	LBA/EIA	100	0	0	0	0	0	0	0	0	25	0.18
389	91	Pit	LBA/EIA	0	0	100	0	0	0	0	0	0	4	0.002
411	100	Pit	LBA/EIA	0	0	0	0	0	0	0	0	0	10	0.006
1175	0	Pit 1174	LBA/EIA	50	33	0	0	0	0	0	0	17	10	0.1
1175	328	Pit 1174	LBA/EIA	0	0	0	0	0	0	0	0	0	3	0.001
1187	0	Pit 1174	LBA/EIA	100	0	0	0	0	0	0	0	0	10	0.098
1187	334	Pit 1174	LBA/EIA	0	0	100	0	0	0	0	0	0	2	0.003
1196	0	Pit 1174	LBA/EIA	0	0	0	0	0	100	0	0	0	20	0.001
1196	338	Pit 1174	LBA/EIA	0	0	0	0	0	90	0	0	10	15	0.005
1186	0	Pit 1172	LBA/EIA	0	0	1	0	0	62	0	0	37	100	0.02
1186	339	Pit 1172	LBA/EIA	0	0	0	0	0	0	0	0	0	1	0.002
1193	0	Pit 1172	LBA/EIA	12	55	33	0	0	0	0	0	0	25	0.238
1193	340	Pit 1172	LBA/EIA	0	100	0	0	0	0	0	0	0	3	0.041
415	0	Pit	EIA	0	70	30	0	0	0	0	0	0	10	0.18
416	0	Pit	EIA	25	25	0	50	0	0	0	0	0	10	0.3

Context	S.No	Interpretation	Period	% of identified fragments									Count	Weight
416	99	Pit	EIA	100	0	0	0	0	0	0	0	0	10	0.008
741	0	Pit	EIA	0	33	0	0	0	0	0	0	67	4	0.056
509	0	Pit	LIA	30	70	0	0	0	0	0	0	0	10	0.12
633	0	Sump	LIA	0	0	0	0	0	0	0	0	0	10	0.02
1149	0	Pit	LIA/RO	80	10	5	5	0	0	0	0	0	30	0.361
538	0	Well	RO	100	0	0	0	0	0	0	0	0	2	0.02
162	0	Pit 163	MD	75	0	0	25	0	0	0	0	0	10	0.12
179	30	Pit 163	MD	0	0	38	0	0	13	0	36	13	12	0.008
605	161	Pit 463	MD	0	0	0	0	0	0	0	50	50	4	0.001
769	0	Pit	MD	24	50	13	13	0	0	0	0	0	10	0.203
769	231	Pit	MD	50	0	50	0	0	0	0	0	0	3	0.004
771	0	Pit	MD	78	10	8	0	0	0	0	0	4	40	0.255
807	235	Ditch	MD	0	0	0	0	0	0	0	0	0	5	0.001
1225	0	Ditch	RO	0	0	0	0	0	0	0	0	0	6	0.02
1232	0	Trackway	RO	0	0	0	100	0	0	0	0	0	1	0.03

A number of pits have been given context numbers (in the Interpretation column) to show how various fills are from the same feature.

APPENDIX 12: ASSESSMENT OF MOLLUSCS FROM AREA 330 ZONE 4

Alan Pipe

1. Introduction

1.1 Mollusc shells were recovered during excavation works at Tollgate ARC TGS 97 and ARC TLG 98 and from the watching brief excavations ARC 330 98.

1.2 Mollusc shells were recovered by wet-sieving and flotation of bulk samples taken in the field. The material was processed using a modified Siraf tank fitted with 1.0 mm and 0.25 mm flexible nylon meshes to retain the residue and flot fractions respectively. The residues and flots were then air-dried, bagged and labelled as sample groups. Each group was then visually sorted for mollusc shells.

1.3 All samples containing mollusc remains were recorded onto a table template in terms of habitat preference and approximate quantification as specified in the CTRL project requirements. No sub-sampling of sample groups was carried out. Preliminary identifications of taxa were made using a binocular microscope and following Cameron & Kerney 1976; and Hayward, Nelson-Smith & Shields, 1996. Allocations of habitat preference followed Kerney 1999.

2. Methodology

2.1 In each case, the soil was processed using a modified Siraf-type tank fitted with 1.0mm and 0.25mm flexible nylon meshes to retain the residue and flot fractions respectively. The flot and residue fractions were air-dried in a warm drying cabinet and then visually sorted for mollusc shell.

2.2 Each sample was roughly quantified and then scanned under a binocular microscope to determine the species-composition of the assemblage. Taxonomic identifications were made using the MoLSS reference collection in conjunction with Cameron & Redfern 1976; and Kerney & Cameron 1979. Allocation of identified taxa to habitat groups, as specified by the CTRL post-excavation assessment report template, followed these sources together with Kerney 1999.

2.3 All mollusc groups were examined; no sub-sampling was required.

3. Quantification

3.1 A total of 26 small groups of mollusc shells, an approximate total of 129 shells, were assessed. This material derived almost entirely from terrestrial species with a few very fragmented shells of marine species. There were no open-country or freshwater species. The identified taxa recovered were *Cecilioides acicula*, *Vallonia sp*., *Cepaea nemoralis*, *Helix aspersa*, Clausilidae, *Pomatias elegans*, *Retinella sp*., *Helicigona lapicida, Hygromia sp., Oxychilus sp.,* common/flat oyster *Ostrea edulis,* common cockle *Cerastoderma edule*, and common mussel *Mytilus edulis.*

3.2 The table below groups this material in terms of habitat preference and relative abundance as specified by the CTRL assessment template.

4. Provenance

4.1 The material is in good condition and presents no difficulty in terms of species identification.

4.2 Mollusc shells were recovered from ARC TGS 97 ([102], a Late Iron Age/Romano-British pit), ARC TLG 98 (four undated samples {1}-{4}), and ARC 330 98. The material from ARC 330 98 derived from an early Iron Age pit fill [741] (Pit [740] Figure 6), a Late Iron Age/Romano-British pit fill [1193] (Pit 1172, Figure 6), a Romano-British pit fill[160] (Pit [160], Figure 11), a medieval hearth fill [418] (Hearth 419, Figure 11), ditch fill [1136] (Ditch 1135), and pit fill [773] (Pit [1148], Figure 8) together with a small group of undated pit, ditch, external, ?furnace and unknown contexts.

5. Conservation

5.1 Further analysis of this material would involve more detailed examination under a binocular microscope in order to ensure precise identification of all species present. There is no reason why such work would damage the shells or impose any restriction on long-term storage procedures.

5.2 The shells are mainly small and fragile and therefore liable to accidental damage by crushing. There should therefore all be stored by context/sample group in glass tubes or clear plastic boxes, each contained within labelled plastic bags. The complete assemblage should then be stored in an archive quality ‘shoe-box’.

5.3 There is no reason to retain the very limited material from ARC TGS 97 and ARC TLG 98; the larger and more diverse group from ARC 330 98 should be retained for further identification and quantification.

6. Comparative material

6.1 Although the very small size of this assemblage does not justify detailed inter-site comparison with any other particular site, for completeness it should be included in any overall view of the CTRL zonal molluscan groups.

7. Potential for further work

7.1 The assemblage has generally little potential for further study in terms of quantification of species, or of ecological interpretation, indeed the material from ARC TLG 98 all derived solely from the burrowing species *C.acicula*.

7.2 Further identification of species present will allow some comment on the general nature of the local environment. This is mainly applicable to the catholic and shade-loving species recovered from ARC TGS 97 and, particularly, ARC

330 98. Identification of the species in the catholic and shade-loving assemblages may allow some interpretation of the local habitat, in terms of vegetation and drainage, in view of the known current distribution of these species in SE England (Kerney 1999). There is no potential for further study of the marine species or of the entirely *C.acicula* group from ARC TLG 98.

8. Bibliography

Cameron, R A D, & Redfern, M, 1976, 'British land snails' *Linnean Society synopses of the British fauna no. 6* London

Hayward, P, Nelson-Smith, A, & Shields, C, 1996, *Sea shore of Britain and Europe* London

Kerney, M, 1999, *Atlas of the land and freshwater molluscs of Britain and Ireland* Colchester

+ present (0-5 items), ++ some (6-10 items), +++ many (11+).

Table 24: Assessment of molluscs from ARC TLG 97 and ARC TLG 98

Event code	**ARC TGS 97**	**ARC TLG 98**	**ARC TLG 98**	**ARC TLG 98**	**ARC TLG 98**
Column/Sectn					
Sample	6	1	2	3	4
Context	102				
Date/interpretation	?Late Iron Age/Romano-British/ pit	unknown	Unknown	unknown	unknown
Catholic species					
Open country species					
Shade-loving species	++				
Burrowing species		+	+	+	+++
Aquatic species					
Marine species					
Approx totals	**6**	**3**	**5**	**5**	**11**

Table 25: Assessment of molluscs from Area 330 Zone 4

Event code	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**
Column/Sectn						
Sample	29	45	102	146	204	165
Context	161	198	418	426	575	617
Date/ interpretation	Romano-British/pit	unknown/ditch	medieval/ hearth	unknown/mech fixture	unknown/destr debris	unknown/ditch
Catholic species		+	+	+	+	+
Open country species						
Shade-loving species			+		+	
Burrowing species		+				
Aquatic species						
Marine species	+					
Approx totals	**2**	**5**	**2**	**1**	**5**	**5**

Event code	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**
Column/Sectn								
Sample	181	178	183	188	203	211	224	238
Context	638	656	684	688	710	741	773	805
Date/ interpretation	unknown	unknown /furnace	unknown /ditch	unknown/ ditch	unknown/ furnace	Early Iron Age/pit	medieval/ pit	unknown/ external
Catholic species				+		+	+	
Open country species								
Shade-loving species		+++	+				+	+
Burrowing species						+		
Aquatic species								
Marine species	+							
Approx totals	**1**	**35**	**1**	**2**	**1**	**2**	**5**	**5**

Event code	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**	**ARC 330 98**
Column/Sectn							
Sample	240	241	244	282	340	315	345
Context	814	818	825	890	1193	1136	1215
Date/ interpretation	unknown/ pit		pit		Late Iron Age/early Romano-British/pit	medieval/ditch	
Catholic species	+	+				+	+
Open country species							
Shade-loving species				+	+		+
Burrowing species							
Aquatic species							
Marine species			+				
Approx totals	**5**	**5**	**1**	**1**	**1**	**2**	**10**

APPENDIX 13: ASSESSMENT OF CHARRED PLANT REMAINS & CHARCOAL

Lisa Gray-Rees

1. Introduction

1.1 This report assesses the contents of 242 environmental bulk samples in Area 330 Zone 4 (sites ARC TLG 98 and contexts from ARC 330 98). These were processed by flotation in a Siraf type flotation tank. 149 samples, all from ARC 330 98, produced botanical remains. The environmental bulk samples from ARC TLG 98 were botanically sterile.

2. Methodology

2.1 Each sample was processed using a Siraf type flotation tank. Residues were collected in a 1mm mesh and flots were collected in a 250-micron mesh. Flots and residues were dried prior to scanning. Residues were scanned by eye. Environmental remains and artefacts (such as burnt flint, brick or tile fragments) were collected and transferred to the relevant specialists. Flots and plant remains recovered from the residues were scanned using a low powered stereo microscope. Charred wood fragments roughly larger than 5mm³ were sampled for identification.

2.2 The modes of preservation, species diversity and abundance of organic remains in each sample were recorded on sheets then entered into the MoLAS/MoLSS Oracle database and transferred to RLE Datasets. Full sample details are given in the table below.

3. Quantifications

3.1 Full details of these samples are given in the table below.

3.2 Charred wood was present in all but seven samples. Charred grain was present in 33 samples; five of these were rich. Charred chaff was present in three samples. Charred seeds were present in sixteen samples; four of these were rich. Uncharred seeds were present in twenty samples; two of these were rich. Uncharred root, stem or moss fragments were present in 55 samples.

3.3 The quantities of remains were estimated and recorded in the following manner:

3.4 For charred remains:

\+ = 1-10
++ = 11-50
+++ = 51-100
++++ = 101-1000
1000+ = >1000.

For waterlogged remains:

\+ = 0-5
++= 6-10
+++=11+

4. Provenance

Bronze Age

4.1 Each sample contained flecks of charred wood. A low number of larger identifiable fragments of charred wood were present in the sample from context [352], a quarry pit [372] (Figure 7).

4.2 None of these samples were rich. A poorly preserved charred grain was found in context [384] (Pit [372]) along with moderate numbers of uncharred goosefoot (*Chenopodium sp*.) seeds. Samples from contexts [352] and [390] (Pit [387], Figure 7) contained abundant uncharred root fragments.

Late Bronze Age/ Early Iron Age (Figure 7)

4.3 These samples were taken from pit fills and one from a posthole fill. The following contexts contained identifiable charred wood:

- from pits: [389], [394], [412] (Pit [387]) (Figure 7), [681], [691] (Pit [679]), [693] (Pit [702]), [680] (Pit [704]) (Figure 5) [1176] (Pit [1174], [1186] (Pit [1172] (Figure 6)
- from posthole fill [399] (Posthole [396], Figure 7)

4.4 Low numbers of charred grains and seeds were present in several samples from pitfills. Poorly preserved grains were recovered from, contexts: [401], [1173], [1176] and [1187]. Other charred remains included low numbers of hazelnut (*Corylus avellana* L) shell fragments in context [373] and low numbers of cleavers (*Galium* spp.) seeds in samples from context [394] and [450].

4.5 Occasional uncharred seeds were present in pitfills from contexts [402], [412], [420] and [1188]. These included seeds of goosefoot (*Chenopodium* spp.) and elder (*Sambucus nigra* L).

4.6 Uncharred moss fragments were recovered from samples in contexts [389], [401], [394], [411], [412], [420], [450] and [458]. Uncharred fragments were present in samples [389], [401], [412], [420], [450], [680], [1176] and [1188]. Moderate amounts of uncharred wood fragments were present in the sample from context [693].

Iron Age

4.7 These samples contained very few plant remains; only flecks of charred wood in all but the sample from [425] (Pit [414], Figure 7), which contained moderate uncharred root fragments.

Late Iron Age/ Early Roman

4.8 Occasional fragments of charred identifiable wood were present in each sample. No other botanical remains were recovered.

Roman

4.9 Charred wood fragments were present in two pits, contexts [1193] (Pit 1172, Figure 6) and [196].

4.10 Occasional charred wheat (*Triticum* spp.) grains were present in two pits in contexts [1193] and [863]. Low numbers of poorly preserved grains were present in ditchfills, contexts [525] and [526] (Ditch 522, Figure 10) and pitfills, contexts [160], [677], [678]. Moderate numbers of poorly preserved grains were present the pitfill, context [609] (Pit [673], Figure 10).

4.11 Moderate amounts of cereal chaff, glume fragments, were present in the ditch fill in context [526]. This sample also contained occasional charred weed seeds. Occasional poorly preserved charred seeds were also present in two ditchfill samples from contexts [526] and [844] and from one pitfill sample from context [160].

4.12 Uncharred seeds were present in low numbers in samples from pitfills from contexts [160], [534], [863] and from a ditchfill from context [848]. These included seeds of goosefoot (*Chenopodium* spp.) and rush (*Juncus* spp.).

4.13 Uncharred, possibly modern fragments of roots, stems and moss were present in samples from pit fills in contexts [136], [534], [664], [863], [932] and from a layer interpreted as external metalling/cobbling, context [1232].

Medieval

4.14 Charred wood was present in each sample. Identifiable wood fragments were present in a ditchfill from context [809] (Ditch [806], Figure 8); a post-hole fill from context [786], associated with pit [1148] (Figure 8) and hearth layer, context [418] (Pit [419], Figure 11).

4.15 Occasional charred wheat grains were present in pitfill samples from context [771], pit [1148], and in poor condition in a sample from a hearth layer, context [418]. Moderate numbers of poorly preserved grains were present in samples from pitfills in contexts [162] and [1045] (a ploughsoil) and in a ditchfill sample from context [809]. Moderate numbers of well-preserved wheat grains were present in a pitfill, context [179].

4.16 Charred seeds were present in pitfills from contexts [162], [179] and [771]. These included seeds of cleavers (*Galium* sp.), vetch/tare (*Lathyrus*/*Vicia*) and brome (*Bromus* sp.). Moderate numbers of poorly preserved uncharred seeds were present in the pitfill from context [162].

4.17 Uncharred, possibly modern fragments of moss, root and stem fragments were present in pitfill samples, contexts [162], [179], [769], [771]; hearth layer, context [418], and from a posthole fill, context [786].

Undated (no pot dates)

4.18 Each of these samples contained charred wood fragments. Four samples were particularly rich. These were a pitfill sample from contexts [225], an unspecified external deposit from context [805] a furnace/oven/kiln deposits from context [500] and a ditch fill sample from context [907].

4.19 The pitfill contained abundant charred seeds; mostly (over 700) those of dock (*Rumex* spp.). The external deposit produced abundant quantities of charred wheat and oat (*Avena* sp.) grains. The furnace/kiln sample contained abundant charred wheat (*Triticum* spp.) grains and charred hazelnut (*Corylus avellana* L) shell fragments. The ditch sample contained abundant and diverse uncharred seeds, including knotgrass (*Polygonum* spp.) and black nightshade (*Solanum nigrum* L).

5. Conservation

5.1 Twenty-one samples have been recommended for further analysis and are listed below. These should be stored and kept dry prior to examination. No further work is recommended on the remaining samples so they may be discarded.

6. Comparative material

6.1 Prehistoric archaeo-botanical remains are scarce and where present often poorly preserved, for example the charred grain deposit at the Iron Age farmstead in Farningham (Vaughan 1984).

6.2 The Romano-British remains may be compared with charred plant remains from Roman sites in Kent such as Lullingstone near Orpington (Arthur 1974; Metcalf and Doherty 1974) and Keston in Bromley (Hillman 1991; Straker

7. Potential for further work

Potential by period

Bronze Age:

7.1 Very few plant remains were recovered form this period but it is recommended that identifications are made of the wood and grain because so little archaeo-botanical work has been carried out for prehistoric Kent.

Late Bronze Age/ Early Iron Age:

7.2 The charred wood from the pits should be identified. If waste was deposited in the pits the identification of the wood would provide information about the types of wood used for fuel. These fragments are too small to provide information about woodland management or wood working.

7.3 Charred grains and seeds were present in several pitfill samples. These assemblages will provide information about cereal use and cultivation. The identification of the seeds will provide information about the environmental conditions in which the crop was grown.

Iron Age:

7.4 These samples were too poor to recommend any further work.

Late Iron Age/ Early Roman:

7.5 These samples were too poor to recommend any further work.

Romano-British:

7.6 The identification of charred wood fragments from pitfills, in contexts [196] and [1193], may reveal which species of wood were used as fuel. These fragments are too small to reveal information about woodland management or woodworking.

7.7 Identification of the charred grain, chaff and seed remains in the pit fills from contexts [526] and [609] will provide information about cereal processing, husbandry and the environmental conditions of the fields.

Medieval:

7.8 Identification of the charcoal form the hearth layer, context [418], would provide information about the species of wood used as fuel.

7.9 Occasional charred wheat grains were also present in this hearth layer. Examination of these and the larger number of grains and charred seeds in the pitfills, context [162] and [179] would provide information about crop husbandry, processing and the environmental conditions in the fields.

Undated (no pot dates):

7.10 These should only be analysed if reliable dates can be assigned.

7.11 The abundant charred seeds in the pitfill, context [225], may be cereal sieving waste. Full identification of the seeds in this sample may reveal whether this is a sieving waste deposit or a store of dock (*Rumex* spp.) seeds for a particular use. The seeds of some species of dock have medicinal uses. If the full assemblage seems to suggest that it is sieving waste then it may reveal information about the ecology of the cereal fields.

7.12 The analysis of abundant quantities of the charred assemblages from the external deposit, context [805], and the furnace/oven/kiln feature, context [500] may clarify the interpretation of each feature and produce information about cereal production.

7.13 The analysis may clarify the interpretation of the feature and will add information about cereal production

7.14 The analysis of abundant and diverse uncharred seeds in the ditch sample may reveal environmental information if it comes form the primary fill of the ditch.

7.15 List of samples recommended for further analysis

- Bronze Age: [352] <81>
- Late Bronze Age/ Early Iron Age: [389] <91>, [394] <98>, [412] <101>, [691] <190>, [693] <192>, [680] <195>, [681] <197>, [1176] <329>, [1186] <339>
- Romano-British: [1193] <340>, [196]<42>, [526] <133>, [609]<186>
- Medieval: [162]<29>, [179] <30>, [418] <102>
- Undated (no pot dates): [225] <54>, [500] <153>, [805] <233>, [907] <277>

7.16 These will be examined using a light microscope with magnifications of between 10 and 40 times. Modern seed and cereal reference collections and reference manuals (e.g. Anderberg 1994, Berijinck 1947 and Berggren 1969,1981) will be used

7.17 Charred wood will be identified by using an epi-luminating microscope to examine fragments of wood in transverse, radial longitudinal and tangential longitudinal sections. These sections will be examined for diagnostic features and identification made using an anatomical key (e.g. Schweingruber 1973).

7.18 Plant remains will be identified as closely as their level of preservation allows. Quantities of uncharred remains and charred wood fragments will be estimated and charred remains will be counted. This data will be recorded onto record sheets and transferred to the MoLAS/MoLSS Botanical ORACLE database.

7.19 Further work:

- Identification and recording of the contents in 21 dry flots
- Charcoal identifications
- Table creation and data analysis
- Report Writing
- Editing
- Archiving

8. Bibliography

Anderberg, A-L, 1994, *Atlas of Seeds Part 4: Resedaceae - Umbelliferae.* Swedish Museum of Natural History, Stockholm

Beijerinck, W, 1947, *Zadenatlas der Nederlandsche Flora.* Veenman and Zonen, Wageningen

Berggren, G, 1969, *Atlas of Seeds Part 2: Cyperaceae.* Swedish Museum of Natural History, Stockholm

Berggren, G, 1981, *Atlas of Seeds Part 3: Saliaceae- Crucifereae.* Swedish Museum of Natural History

Hillman, G, 1991, 'A Sample of Carbonised Plant Remains' in Philp, B, et al *The Roman Villa Site at Keston, Kent – first Report (Excavations 1968-1978)* The Kent Archaeological Rescue Unit

Metcalf, CR, and Doherty, G, 1974, 'Botanical Remains' in Meates G, W, *The Roman Villa at Lullingstone Kent.* Kent Archaeological Society Monograph Series No. 317-8

Schweingruber, FH, 1978' *Microscopic Wood Anatomy*

Straker, V, 1999, 'The Carbonised Plant Remains from Shaft E' in Philp, B, *The Roman Villa Site at Keston, Kent – second report (Excavations 1967 and 1978-1990)* The Kent Archaeological Rescue Unit

Vaughan, D, 1984, 'The Charred Grains' Microfiche 7, in Philp, B, *Excavations in the Darent Valley, Kent.*

Table 26: Assessment of Charred Plant Remains & Charcoal

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
3031	377 / external unspecified	UN	85	30	0	-	-	-/-	+		800ml
4001	642 / pit	UN	179	10	0	-	-	-/-	+		500ml
4002	652 / furnace, oven, kiln	UN	147	20	10	-	-	-/-	+++	low numbers of uncharred root fragments	200ml
4004	656 / furnace, oven, kiln	UN	178	10	25	-	-	-/-	++	low numbers of uncharred moss fragments	2000ml
4016	619 / ditch	UN	166	c10	2	+	-	-/-	++	abundant uncharred root fragments	1000ml
4020	623 / ditch	UN	168	30	0	-	-	-/-	+		1500ml
4021	832 / pit	UN	248	30	2	-	-	-/-	+++	abundant uncharred root and moss fragments	500ml
4022	833 / pit	UN	249	30	0	-	-	-/-	++		500ml
4023	835 / pit	UN	255	20	10	+	-	-/-	++++	moderate numbers of uncharred root and moss fragments	0ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4023	836 / pit	UN	256	10	20	-	-	-/+	+++		100ml
4028	878 / pit	LBA/EIA	266	30	0	-	-	-/-	+++		400ml
4029	693 / pit	LBA/EIA	192	30	0	-	-	-/-	+		500ml
4030	692 / external unspecified	UN	191	30	0	-	-	-/-	+		800ml
4031	681 / pit	LBA/EIA	197	10	0	-	-	-/-	+		1000ml
4031	691 / pit	LBA/EIA	190	20	0	-	-	-/-	+		5000ml
4031	705 / pit	LBA/EIA	217	10	0	-	-	-/-	++		600ml
4032	680 / pit	LBA/EIA	195	30	0	-	-	-/-	+	occasional fragments of waterlogged wood/roots	2000ml
4033	710 / furnace, oven, kiln	UN	203	30	0	-	-	-/-	+		4000ml
4034	736 / pit	UN	207	30	10	-	-	-/+	+++	low numbers of uncharred root fragments	100ml
4034	737 / pit	UN	208	60	0	-	-	-/-	+		500ml
4035	742 / pit	UN	209	10	0	-	-	-/-	++		400ml
4035	751 / pit	UN	213	30	0	-	-	-/-	+		1000ml
4037	712 / furnace. oven, kiln	UN	216	20	10	-	-	+/-	+++++	abundant uncharred root and stem fragments	700ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4038	714 / posthole	UN	202	1	5	-	-	-/-	++	abundant uncharred root and moss fragments	0ml
4039	713 / posthole	UN	201	3	10	-	-	-/-	+++	low numbers of uncharred moss and root fragments	50ml
4040	684 / ditch	UN	183	10	5	-	-	-/-	-	occasional fragments of uncharred root and stem fragments	1000ml
4041	397 / posthole	UN	94	10	5	-	-	-/+	+++	uncharred modern moss and root fragments	600ml
4042	399 / posthole	LBA/EIA	95	6	0	-	-	-/-	+		2000ml
4055	431 / posthole	UN	117	10	0	-	-	-/-	++		800ml
4071	352/ quarry pit	BA	81	20	20	-	-	-/-	++++	abundant uncharred root fragments	4000ml
4071	384 / quarry pit	BA?	88	20	5	+	-	-/++	+++		5000ml
4071	386 / quarry pit	BA	89	30	20	-	-	-/-	+++		1500ml
4072	416 / pit	IA	99	30	0	-	-	-/-	++		500ml
4072	416 / pit	IA	99	30	0	-	-	-/-	++		500ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4072	417 / pit	IA?	105	20	0	-	-	-/-	+		5000ml
4072	425 / pit	IA?	106	30	5	-	-	-/-	-	very little, uncharred root fragments	1000ml
4073	552 / pit	LIA/RO	123	30	0	-	-	-/-	++		500ml
4073	553 / pit	LIA/RO	124	30	0	-	-	-/-	+		2000ml
4074	428 / pit	UN	107	10	0	-	-	-/-	+		500ml
4077	500 / furnace, oven, kiln	UN	153	20	20	++++	-	+++/-	+++	low uncharred moss fragments	1000ml
4078	509 / pit	LIA/RO	120	c10	0	-	-	-/-	+		2000ml
4080	480 / pit	UN	116	20	0	-	-	-/-	+		500ml
4081	436 / pit	UN	118	10	0	+	-	+/-	+++		800ml
4082	373 / pit	LBA/EIA	82	c10	?	-	-	+/-	+++		1000ml
4082	458 / pit	LBA/EIA	158	10	2	-	-	-/-	+	low numbers of moss fragments	1000ml
4083	401 / pit	LBA/EIA	96	20	5	+	-	-/+	++	uncharred moss and root fragments	5000ml
4083	402 / pit	?LBA/EIA	97	20	0	-	-	-/-	+		2100ml
4083	420 / pit	?LBA/EIA	103	20	5	-	-	-/-	++	moderate numbers of uncharred moss and root fragments	1000ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4083	430 / pit	LBA/EIA	109	c10	5	-	-	-/+	+++++	moderate numbers of uncharred moss and root fragments	1500ml
4083	450 / pit	LBA/EIA?	112	20	10	-	-	+/-	++++	abundant moss and root fragments	1000ml
4083	547 / pit	LBA/EIA?	119	20	0	-	-	-/-	++		1000ml
4083	566 / pit	LBA/EIA?	121	20	0	-	-	-/-	+++		1000ml
4084	388 / pit	LBA/EIA	90	20	0	-	-	-/-	+++		2000ml
4084	389 / pit	LBA/EIA	91	20	5	-	-	-/-	+++	uncharred moss and root fragments	2000ml
4084	390 / pit	BA	92	10	5	-	-	-/-	+++	modern root fragments	6000ml
4084	393 / pit	?LBA/EIA	93	10	0	-	-	-/-	+++		800ml
4084	394 / pit	LBA/EIA?	98	20	2	-	-	+/-	+	uncharred moss fragments	1500ml
4084	411 /	LBA/EIA?	100	20	5	-	-	-/-	+++	low numbers of uncharred moss fragments	600ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4084	412 / pit	LBA/EIA	101	20	2	-	-	-/-	+++	moderate numbers of uncharred moss and root fragments	5000ml
4085	741 / pit	IA	211	c10	0	-	-	-/-	+++++		4000ml
4085	743 / pit	IA?	212	10	0	-	-	-/-	+		500ml
4086	1175 / pit	LBA/EIA	328	30	0	-	-	-/-	+++		3000ml
4086	1176 / pit	LBA/EIA	329	20	5	+	-	-/-	++++	abundant root fragments	2000ml
4086	1187 / pit	LBA/EIA	334	30	0	+	-	-/-	++		500ml
4087	1173 / pit	LBA/EIA	327	c10	0	+	-	-/-	+++		5000ml
4087	1182 / pit	LBA/EIA	331	10	0	-	-	-/-	+		1000ml
4087	1186 / pit	LBA/EIA?	339	c10	0	-	-	-/-	+++		4000ml
4087	1188 / pit	LBA/EIA	336	c10	10	-	-	-/+	+++	abundant root fragments	2500ml
4087	1193 / pit	RO	340	c10	20	+	-	+/-	++++	abundant root fragments	2000ml
4091	611 / furnace, oven, kiln	UN	324	10	20	-	-	+/-	++++	abundant uncharred root fragments	500ml
4091	612 / furnace, oven, kiln	UN	325	10	10	-	-	-/-	+++	moderate numbers of uncharred root fragments	20ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4093	1169 / furnace, oven, kiln	UN	326	30	5	-	-	-/++	+++	moderate numbers of uncharred root and moss fragments	1000ml
4096	907 / ditch	UN	277	10	5	+	-	-/+++	+++	abundant uncharred stem and moss fragments	400ml
4099	777 / hearth	UN	227	10	10	-	-	-/-	+++++	abundant uncharred moss fragments	1000ml
4100	807 /ditch	UN	235	20	10	+	-	+/+	+	abundant uncharred root and moss fragments	2000ml
4101	809 / ditch	MD	236	30	0	+++	-	-/-	+		1000ml
4105	823 / ditch	UN	243	10	0	-	-	-/-	+		100ml
4107	805 / external unspecified	UN	233	20	10	+++	-	-/+	+	abundant uncharred modern root and moss fragments	2000ml
4108	462 / pit	MD	159	10	0	-	-	-/-	++		600ml
4113	583 / ditch	UN	145	10	0	-	-	-/-	++		300ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4114	433 / pit	UN	110	10	5	-	-	-/-	+++++	low numbers of uncharred modern moss fragments	2000ml
4115	448 / pit	UN	111	10	0	-	-	-/-	+		300ml
4117	615 / natural strata	UN	164	c10	0	-	-	-/-	-	occasional fragments of waterlogged wood	300ml
4120	614 / sump-waterhole	RO?	163	30	0	-	-	-/-	+		250ml
4120	631 / sump-waterhole	RO	170	30	0	-	-	-/-	+		1750ml
4120	633 / sump-waterhole	RO?	171	c10	0	-	-	-/-	+		250ml
4120	664 / pit	RO?	174	30	5	-	-	-/-	++	moderate numbers of moss and root fragments	500ml
4124	1164 / ditch	UN	322	30	0	-	-	-/-	+		100ml
4125	769 / pit	MD	231	30	10	-	-	-/-	++	abundant root and stem fragments	200ml
4125	771 / pit	MD	223	20	20	+	-	-/+	+++	abundant modern root fragments	800ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4125	773 / pit	MD	224	30	0	-	-	-/-	+		1500ml
4125	786 / posthole	MD	232	10	10	-	-	-/-	++++	abundant root and stem fragments	1000ml
4125	1149 / pit	RO	318	30	0	-	-	-/-	+		200ml
4130	1183 / pit	UN	333	10	0	-	-	-/-	+		200ml
4132	754 / hearth	UN	218	10	0	-	-	-/-	+++		1000ml
4133	669 / hearth	UN	221	10	0	-	-	+/-	+		1000ml
4137	1141 / ditch	UN	323	30	0	+	-	-/-	++		600ml
4140	1045 / pit	MD	311	10	0	++	-	-/-	+++		400ml
4148	152 / ditch	UN	24	20	0	-	-	-/-	+		1000ml
4151	196 / pit	RO	42	20	0	+	-	-/-	+++		200ml
4154	198 / ditch	UN	45	10	5	+	-	-/+	-	uncharred root fragments	500ml
4155	162 / pit	MD	29	10	10	++++	-	+++/+++	+++++	uncharred stem and root fragments	400ml
4155	179 / pit	MD?	30	10	10	++	-	+/+	+++	uncharred stem and moss fragments	200ml
4158	192 / pit	UN	35	c10	0	-	-	-/-	+		1000ml
4159	174 / external unspecified	RO	31	0	0	-	-	-/-	+		600ml
4162	225 / pit	UN	54	10	30	+	-	++++/-	+++++	some uncharred moss	200ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4163	418 / hearth	MD	102	20	30	+	-	-/-	+++	abundant uncharred root, stem and moss fragments	3000ml
4164	534 / pit	RO	136	10	5	-	-	-/+	++	uncharred moss and root fragments	300ml
4164	536 / pit	RO	138	10	10	-	-	-/-	+++		300ml
4165	525 / ditch	RO	132	10	0	+	-	-/-	+		200ml
4165	526 / ditch	RO?	133	10	5	+	++	+/-	-		150ml
4165	527 / ditch	RO?	134	10	0	-	-	-/-	+		400ml
4167	531 / ditch	UN	125	20	0	-	-	-/-	++		200ml
4168	523 / ditch	RO	108	10	0	-	-	-/-	+		100ml
4169	567 / ditch	UN	131	10	5	-	-	-/-	+	low numbers of uncharred moss and stem fragments	100ml
4171	570 / pit	UN	130	10	0	-	-	-/-	+		150ml
4172	572 / external unspecified	UN	141	10	0	+++	+	+++/-	+++		1000ml
4173	529 / pit	BA	140	10	0	-	-	-/-	++		1500ml
4176	575 / destruction debris	UN	204	30	5	-	-	-/-	+++		8000ml
4176	576 / destruction debris	UN	205	10	700	-	+	-/-	++++	low numbers of uncharred moss fragments	4000ml

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4176	686 / destruction debris	UN	184	30	15	-	-	-/-	+++		5000ml
4176	759 / destruction debris	UN	222	30	0	-	-	-/-	+		5000ml
4176	778 / destruction debris	UN	225	10	0	+	-	-/-	+++		1000ml
4176	781 / destruction debris	UN	226	10	5	-	-	-/-	+++	occasional uncharred moss fragments	1000ml
4177	160 / pit	RO	33	10	0	+	-	+/+	+		1000ml
4178	186 / pit	UN	34	10	0	-	-	-/-	+		500ml
4184	609 / pit	RO	186	30	0	++	-	-/-	++		600ml
4184	677 / pit	RO	198	20	0	+	-	-/-	-		2000ml
4184	678 / pit	RO	196	10	0	+	-	-/-	+		800ml
4193	984 / external metalling/ cobbles	UN	306	30	0	-	-	-/-	+		500ml
4197	955 / external metalling/ cobbles	UN	290	30	0	-	-	-/-	+		100ml
4200	941 / ditch	UN	281	30	0	-	-	-/-	++		0ml
4200	980 / ditch	UN	298	20	0	-	-	-/-	+		2000ml
4202	848 / ditch	RO	254	30	0	-	-	-/-	+		2000ml
4202	953 / layer	UN	289	30	0	-	-	-/-	+		

Sample Details					**Flot Details**						**Residue**
Sub group	Context & type	Period	Sample number	Sample size (l)	Sample Size (ml)	Grain	Chaff	Weed Seeds charred/ uncharred	Charcoal	Comments	
4203	840 / natural erosion feature	UN	251	30	2	-	-	-/+	-	occasional uncharred moss and root fragments	800ml
4203	841 / natural erosion feature	UN	252	30	0	-	-	-/-	++		800ml
4207	863 / pit	RO	258	30	5	+	-	-/+	++++	abundant moss and root fragments	1500ml
4207	932 / pit	RO?	279	10	10	-	-	-/-	++++	occasional root fragments	300ml
4208	816 / ditch	UN	239	10	0	-	-		+++		1500ml
4210	828 / pit	UN	245	30	0	-	-	-/-	+		2000ml
4211	844 / ditch	RO	253	c10	2	-	-	-/+	+++		600ml
4214	820 / pit	UN	242	10	0	-	-	-/-	+++		1000ml
4215	825 / pit	UN	244	10	10	+	-	-/-	++++	abundant uncharred root and moss fragments	1000ml
4226	1232 / external metalling/ cobbles	RO	355	c10	30	-	-	-/-	+	occasional moss fragments	100ml
4234	1212 / ditch	UN	343	c10	0	-	-	-/-	+		800ml
4235	1215 / ditch	UN	345	c10	0	-	-	-/-	+		500ml

APPENDIX 14: ASSESSMENT OF GEO-ARCHAEOLOGY

Jane Corcoran

1. Introduction

1.1 Four monolith samples were taken through Quaternary slope deposits exposed in section midway down the present side of the Wrotham Road (A227) dry valley (Figure 4, ARC TLG 98). The aim of the monolith assessment was to describe and provisionally interpret these deposits and suggest any further work that might provide information on the sequence of Pleistocene events and environments they represent.

1.2 The monolith samples were obtained by hammering a 500mm x 50mm x 50mm tin into the cleaned section face. The sediments and stratigraphy visible in section were described and drawn by the excavators on site. The monolith location was marked on the section drawing and a level, related to Ordnance Datum was taken on the top of the tin.

2. Methodology

2.1 The sediments sampled in each tin were cleaned and described using standard sedimentary criteria. This attempts to characterise the visible properties of each deposit, in particular relating to its colour, compaction, texture, structure, bedding, inclusions clast-size and dip.

2.2 Every distinct unit was given a separate number and the nature of the contacts between each unit noted. Where several units appear to be part of the same depositional phase or event they have been grouped into a larger unit [indicated by a letter].

3. Quantifications

3.1 The results of the monolith assessment are set out in the following table:

Table 27: Assessment of Geo-Archaeology

tin	Unit	Elevation of contact & thickness of unit	Description and Contacts	Assoc. bulk samples
			The top of the monolith sequence lay about 0.30m below present ground-level, which sloped from south to north along the trench and was about 47.5m OD in the sampling location. About 0.30m of ploughsoil lay above the monolith sequence.	
		47.14	TOP OF MONOLITH SEQUENCE	
1	A1	[0.30m thick]	Dark yellowish brown 10YR4/6 slightly sandy clayey silt. Clay especially infilling root channels. Other root channels are humic filled. Soft and compact. Very occasional grit. Very occasional fine rootlets. This unit thins to the south where unit B rises close to the surface, but otherwise follows the dip of the landsurface and ploughsoil down valley. Clear contact to:	Bulk <1>
1	A2	[m thick]	Yellowish brown 10YR5/6 slightly sandy silt. Occasional fine chalk granules. Frequent carbonate flecks and threads. This unit thickens down valley (to the north) and wedges out to the south where unit B rises close to the surface.	
		c.46.80	Sharp wavy irregular contact sloping from south down to north	
2	B	[c.75m thick]	Poorly sorted angular chalk and flint rubble in clay and sand matrix. This unit was too coarse for sampling, however the lowest part of it, mainly pellety chalk with occasional angular flints and clay lenses, was sampled in the top of monolith 2.	bulk<2>
		c45.60	Sharp irregular sub-horizontal contact	
2	C	[0.10m thick]	Dark yellowish brown 10YR4/6 clayey sandy silt matrix with occasional poorly sorted sub-rounded chalk granules and sub-angular flint pebbles. Occasional fragmented bedding. Moderately compact and soft.	
		45.50	Distinct irregular contact	

tin	Unit	Elevation of contact & thickness of unit	Description and Contacts	Assoc. bulk samples
2/3	D1	[0.18m thick]	Interbedded brown 10YR5/4 sandy clay-silt; pale brown 10YR6/3 sandy silt; dark yellowish brown 10YR4/4 sandy clay-silt; and occasional white 10YR8/1 sand laminae, speckles and patches. Compact and moderately hard. Very common iron concretion nodules (1-3mm diameter) and manganese speckles. Diffuse contact to	
2/3	D2	[0.40m thick]	Predominantly brown 10YR5/4 sandy clay-silt. Similar to D1 but beds exist only as disrupted patches and an increase in white (leached) speckles and patches of fine sand towards base of unit. Possible root void with carbonate precipitations. Fewer iron concretions than D1 or D3 and those that exist are less nodular and more thread-like or speckled. Diffuse contact to:	bulk<3>
3/4	D3	[0.50m thick]	Pale brown 10YR6/3 with brown 10YR5/3 patches. Slightly clayey silty fine sand. Very frequent iron nodules 1-5mm diameter: more frequent and larger than in either D1 or D2. Frequent white 10YR8/1 speckles. No visible bedding or laminations.	bulk<3>
		44.42	BASE OF MONOLITH PROFILE	

4. Provenance

4.1 The sediments were located midway up the side of a dry valley about 250m south of the monolith samples taken at Northumberland Bottom (ARC TGW 97). These were from closer to the valley floor in the same dry valley. The present site was also about 500m west of the location of a lower palaeolithic handaxe found in solifluction deposits at about 60.30m OD (ARC TGS 97).

4.2 The sediments appear to represent four main units. Unit D may be derived from Thanet Beds and is in general a silty fine sand fining up to a sandy silt. It is characterised by frequent iron nodules and bleached patches with manganese speckles and discontinuous white sandy laminae. These are characteristics of ice segregation and waterlogging in arctic soils, where waterlogging at the surface occurs, with impeded drainage due to frozen subsoil (Fedorova & Yarilova 1972; Van Vliet-Lanoe 1985; Vepraskas et al 1994). Similar characteristics have been found in Quaternary pedosedimentary profiles (Kemp 1985; Kemp et al 1992) and it is inferred that these sediments were close to the landsurface during a period of wet periglacial climate.

4.3 The sub division of this unit into three sub-units may suggest either fluctuations in the climate at this time, gradual accretion of the deposit (during summer snowmelt) or it may result from the different depths of each sub-unit below the former ground level. The disturbed nature of D2 with possible evidence for

rooting and fewer iron nodules and the bedded D1 above it, which has slightly finer iron concretions than D3, may indicate a fairly stable earlier arctic soil (D2+3) that was buried by faster sediment accretion (D1) perhaps as snow melt increased and the climate ameliorated.

4.4 If this is the case, unit C might be interpreted as redeposited brown-earth type soil material. This may have developed across the landscape in an intervening warm period and would therefore have been the first sediment to be eroded and redeposited downslope as climate deteriorated once again, prior to the thick solifluction deposits (unit B) accumulating. Evidence for an argillic brown earth soil developing during the Windermere interstadial has recently been observed at Heathrow Airport (Rose et al 2000).

4.5 However the increasing silt content up through unit D, together with the more distinct banding in the sediment might indicate increasingly dry conditions with loessic input and less water in the soil. In which case The cold wet environment during which unit D accumulated and probably the dry valley was cut may have immediately predated the accumulation of soliflucted deposits on the valley sides and floor.

4.6 Soil micromorphological investigation may be able to test and elaborate on these alternative interpretations.

4.7 Large scale erosion of the landscape must have occurred during the period represented by these dry valley sediments. This is illustrated by the source material of the earlier fill (unit D) being derived from Thanet Beds, which would have been far more extensive prior to the late Devensian, and the later fill (unit B) being derived largely from the chalk, indicating that by this time the Thanet Beds had been removed from the immediately surrounding landscape.

4.8 It is thought that the large scale erosion that created the dry valleys of the present landscape occurred during the late glacial period (14-10ka BP) and especially during the Loch Lomond Stadial (Younger Dryas) the cold stage immediately prior to the Holocene (11-10ka BP). The date of organic remains buried below a swathe of coombe rock eroded from the Devils Kneadingtrough, a dry valley close to Wye in Kent, and forming a fan above the Gault Clay plain is around 11-12ka BP (Preece 1994) suggesting that the dry valley must have been formed or massively re-shaped after 11ka BP. However the incision of Holywell Coombe, a dry valley near Folkstone, was probably closer to the Last Glacial Maximum (c.18-25ka BP) as it contained organic deposits dated to the early late glacial period (Preece & Bridgeland 1998).

4.9 The late glacial is thought, in Britain, to consist of a cold period, prior to 13ka BP (Oldest Dryas), followed by the Windermere Interstadial a warm period, around 13-11ka BP and finally the Loch Lomond Stadial (Younger Dryas), a cold period from 11-10ka BP (Lowe & Walker 1997). In continental Europe evidence for a very short lived cold stage, the Older Dryas is found within what is our Windermere Interstadial, separating it into the Bolling and Allerod interstadials.

4.10 Further analysis of the characteristics of, and trends within, units C and D in the present profile may therefore be able to suggest whether this dry valley was carved out during a single cold stage or whether a warm stage intervened, which would help to place it within the chronological framework of the Late Glacial. The sediments are also likely to preserve evidence with which the changing vegetation and landscape for the Late Glacial period in this area might be

reconstructed. The most appropriate techniques for these purposes would be pollen and soil micromorphology.

4.11 The hand-axe found at ARC TGS 97 came from a soliflucted deposit, but was in fresh condition, which suggested it had not been transported far. The deposit was at 60.30m OD, considerably further upslope than the present soliflucted deposits. Whilst this does not necessarily mean they could not have been deposited at the same time, the soliflucted material at ARC TGS 97 was reported to have come from the north-west of the ARC TGS 97 site - an area that is today a dry valley. This implies that the soliflucted deposit in which the handaxe was found accumulated prior to the incision of the dry valley system. Its deposition was likely to have been between 25-14ka BP (URL 1997). Thus, if similar material were to have been found within the coombe rock (unit B) of the dry valley, it would be one stage further redeposited than its context upslope, and the dry valley deposits would be of little use in reconstructing the environment contemporary with the use of the handaxe (somewhere between 500-50ka BP).

4.12 Above the coombe rock the fine sediments (unit A) were calcareous and silty (and similar in these respects to some extent was unit C). This is likely to be a result of a loessic input and soil formation in this and weathered chalk material from the early Holocene onwards. The unit represents the clay enriched 'Bt' horizon (A1) and the carbonate precipitated 'Cca' horizon (A2) of an argillic brown earth type soil. These characteristics most probably developed before the recent period of agricultural activity, which has created the upper ploughsoil (not sampled).

4.13 Unit A resembles the sediment sampled further down valley in Northumberland Bottom (ARC TGW 97). It is thinner than the Holocene deposits at ARC TGW 97 as the latter was sampled close to the valley floor and was thus in a predominantly sediment receiving location in the landscape. In contrast, the present site, midway upslope, will have lost more sediment to erosion than it will have received itself from further upslope.

4.14 Although there is no direct dating evidence for this deposit it would be valuable to compare its pollen profile with that from Northumberland bottom. Using pollen as a rough dating guide this should be able to provide more information on the pulses and environment of sediment erosion and stability within the valley catchment, and enable inferences to be made regarding the possible involvement of human activities in local landscape change.

5. Conservation

5.1 If thin sections are made of the monolith they will take up less storage space, stand a better chance of long term preservation and be amenable to a similar method of archiving to that for finds and environmental samples. As monoliths, samples are not easily stored, need to be kept in a cool to cold and dark environment and will be likely to deteriorate with time. In addition thin sections are easily available for further research and can be examined frequently without loss of information. Stored monoliths are less accessible and will gradually loose their potential for preserving information, especially as each time they are examined further cleaning will wear away the surface.

5.2 In the same way, processed sub-samples taken from the monolith will be easier to store and less likely to deteriorate than the original soil material and will provide supporting information to the thin sections.

5.3 Long term storage as a monolith sample is likely to be costly and is not an efficient use of space or archive material. After analysis, if not impregnated with resin and converted to thin sections, the sample should be discarded.

6. Comparative material

6.1 These monolith samples should be compared to those from ARC TGW 97, which were taken from the same dry valley but slightly downslope and closer to the valley floor. The ARC TGW 97 samples appear to correspond with unit A and the upper part of B of the ARC TLG 98 samples and are likely to represent the colluvial accumulation during the Holocene period.

6.2 Much geo-archaeological research has been undertaken on the slope deposits in the dry valleys of south-east England. This has focussed on identifying periods of instability (sediment accumulation) and stability (soil formation) and attempting to correlate these events with evidence for human activity (Burleigh & Kerney 1982; Bell 1983, Allen 1992).

6.3 Examination of deeply stratified colluvial profiles have shown that, as a result of accelerated soil erosion, the deep brown earth soils that developed in the early Holocene below woodland have been removed (Bell and Boardman 1992). Where the colluvial deposits have been well dated (mostly by pottery inclusions or the burial of dated features) the periods of accelerated erosion and stability have been directly correlated with episodes of human occupation and activity upslope (Macphail *et al* 1990; Bell & Walker 1992, 193, Allen 1992).

6.4 Valley sediments have been recorded and sampled from several of the CTRL sites (assessment currently in progress). As such they record sequences and chronologies for periods of landscape stability and instability that might be compared with each other and to other evidence for human settlement and activity across the North Downs landscape.

6.5 In addition, work being undertaken by MoLAS on the A2-M2 widening scheme should provide further comparative material.

6.6 The Pleistocene deposits at the base of the profile should be compared to the evidence from ARC STP 99, in the adjacent dry valley, where thick loessic Late Glacial sediments were sampled. Comparison should also be made with other evidence from SE England and the North Downs in particular for Late Glacial climate, environment and landscape change (Kerney 1963, 1965; Preece 1994, 1998; Preece and Bridgeland 1998; Rose *et al* 2000).

7. Potential for further work

7.1 The data from the monolith samples has potential to address the following landscape zone and fieldwork aims:

- *To study the natural landscape, its geomorphology, vegetation and climate, as the context within which the archaeological evidence can be interpreted.*
- *Farming communities (2000 BC-100 BC): to consider environmental change resulting from landscape organisation and re-organisation.*

7.2 However the main potential of the samples will be to provide information about the Late Glacial environment.

7.3 This potential might best be achieved by examination of soil micromorphological thin sections and pollen analysis.

Table 28: Recommendations for further work on the monolith samples

Task	requirement
Preparation and analysis of pollen samples (*): • 12 at c. 0.40mm intervals through unit A (select 8 for analysis) • 32 at c.0.40mm intervals through units C+D (select 24 for analysis)	Geoarchaeologist + Pollen specialist
a) Impregnation of 4.monolith samples and manufacture of 9 thin sections of c.110 x 70mm • from across contacts A1/A2 contact and A2 base in monolith <1> • from B/C, C/D1 and D1/D2 contacts in monolith <2> • from D2 and D2/D3 contact in monolith <3> • from upper and lower parts of D3 in monolith <4> b) analysis / interpretation of the depositional and post-depositional characteristics recorded in these samples (*)	Geoarchaeologist + Stirling University (Likely to take 3 months to prepare the thin sections) Soil micromorphologist / geoarchaeologist
Integration of the pollen and micromorphological data and comparison of the sequence and chronology of events with the sites and sources outlined in section 6.	Geoarchaeologist
* It is suggested that the thin sections / pollen slides should initially be scanned to assess their potential and, if suitable the analysis should be undertaken on selected samples if necessary.	

8. Bibliography

Allen MJ, 1992, *Products of erosion and the Prehistoric landuse of the Wessex chalk' in Past and present soil erosion: archaeological and geographical perspectives* Eds Bell & Boardman

Bell, M, & Walker, MJC, 1992, *Late Quaternary environmental change: physical and human perspectives*

Bell, M, 1983, 'Valley sediments as evidence for prehistoric landuse on the South Downs' *Proceedings of the Prehistoric Society* 49, 119-150

Burleigh, R, & Kerney, MP, 1982, 'Some chronological implications for a sub-fossil molluscan assemblage from a Neolithic site at Brook, Kent, England' *Journal of Archaeological Science* 9, 29-38

Fererova, NN, & Yarilova, EA, 1972, 'Morphology and genesis of prolonged seasonally frozen soils of Western Siberia' *Geoderma* 7, 1-13

Kemp, RA, 1985, 'The decalcified lower loam at Swanscombe, Kent: a buried Quaternary soil' *Proceedings of the Geologists' Association* 96(4) 343-355

Kemp, RA, Jerz, H, Grottenthaler, W & Preece, RC, 1994, *Pedosedimentary fabrics of soils within loess and colluvium in southern England and southern Germany in Soil Micromorphology: studies in management and genesis Developments in Soil Science 22* Eds. Ringrose-Voase & Humphries, 207-219

Kerney, MP, 1963, 'Late Glacial deposits on the chalk of SE England' *Philosophical Transactions of the Royal Society of London*, B246 203-254

Lowe, JJ & Walker, MJC, 1997, *Reconstructing Quaternary Environments*

Macphail , RI, Courty, MA, & Gebhardt, A, 1990, 'Soil micromorphological evidence for early agriculture in NW Europe' *World Archaeology* 22(1) 53-69

Preece, RC, & Bridgland, DR, 1998, *Late Quaternary Environmental Change in NW Europe: Excavations at Holywell Coombe, SE England*

Preece, RC, 1994, 'Radiocarbon dates for the Allerod soil in Kent' *Proceedings of the Geologists' Association* 105, 111-123

Preece, RC, 1998, 'Upper Halling' in *The Quaternary of Kent and Sussex,* Field Guide QRA Ed. Murton et al

Rose, J, Lee, JA, Kemp, RA & Harding, PA, 2000, 'Palaeoclimate, sedimentation and soil development during the Last Glacial Stage (Devensian), Heathrow Airport, London, UK' in *Quaternary Science Reviews* 19 827-847

URL, 1997, 'South east of Tollgate (ARC TGS 97) an archaeological evaluation' Geology, prepared by Allen MJ for MoLAS

van Vliet-Lanoe, B, 1985, 'Frost effects in soils' in *Soils and Quaternary landscape evolution* 117-158 (Ed. Boardman)

Vepraskas, MJ, Wilding, LP & Drees, LR, 1994, Aquic conditions for soil Taxonomy: concepts, soil morphology and micromorphology in *Soil Micromorphology: studies in management and genesis Developments in Soil Science* 22 Eds. Ringrose-Voase & Humphries, 117-131

APPENDIX 15: ASSESSMENT OF LUMINESCENCE DATING

Sarah M. Barnett, University of Durham

1. Introduction

1.1 Samples were taken from two locations:

- Location 1: sediments beneath the sarsen stones (Group 1, Figure 9)
- Location 2: sediments from a large cut, possibly a well adjacent to the sarsen stones (Group II, [630] Figure 9)

1.2 In total, six subsamples, three from each of the two locations, were selected for testing. Tests were made using infrared stimulated luminescence (IRSL) in which the dominant emissions are from feldspars within the silt-sized (2-10μm) fraction selected for measurement. Dates were obtained for the three samples from the pit/well; the sediments from beneath the sarsen stones were incompletely bleached and no dates were determined.

2. Methodology

Location 1

2.1 A monolith was taken of the colluvium at the top of the section beneath Group I Sarsen stones (contexts 628 and 698). The flint layer prevented a second monolith being taken and lower samples were taken in film canisters knocked into the section.

Samples taken:

Sample number	*Distance from top of section*	*Notes*	*Context*
6	0.13m to top of monolith	0.50m monolith	628 & 698
7	0.66m	canister	698
8	0.79m	canister	698
9	0.87m	canister	698

2.2 Subsamples were taken in the laboratory under subdued red light conditions.

2.3 Samples were extracted from the film canisters under subdued red light conditions by slicing through both sediment and canister at the top and bottom. The ends of the sample which had been exposed to light were discarded and the central portion used for luminescence measurements. Samples for dose-rate measurements were collected in a separate bag at the time of sampling from the section. Sample 255-8 was very dry and crumbly and not possible to subsample.

2.4 When sampling from the monolith, the sediment which had been exposed to light during sampling was removed and five subsamples were taken:

255-6-5	@ 50 – 80mm from top of monolith.
255-6-15	@ 0.13 – 0.15m.
255-6-25	@ 0.25 – 0.27m.
255-6-35	@ 0.35 – 0.37m.
255-6-45	@ 0.45 – 0.47m.

2.5 Three sub-samples were selected for luminescence testing: 255-6-5, 255-6-45 and 255-9.

Location 2

2.6 Two monoliths taken from the section of the pond [630] (contexts 614 and 744) with 19 cm overlap.

Samples taken:

Sample number	*Distance from top of section*	*Notes*	*Context*
10	70mm to top of monolith	50 cm monolith	614
11	0.48m to top of monolith	50 cm monolith	614 & 744

2.7 When sampling from the monolith, the sediment which had been exposed to light during sampling was removed. Three sub-samples were taken from sample 255-10 and two samples from 255-11:

255-10-12 @ 0.10 – 0.12m from top of monolith	context 614
255-10-30 @ 0.29 – 0.31m	context 614
255-10-45 @ 0.43 – 0.45m	context 614
255-11-25 @ 0.23 – 0.26m from top of monolith	context 614
255-11-45 @ 0.38 – 0.42m	context 744S

2.8 Three sub-samples (255-10-12, 255-10-30, 255-10-45) were selected for luminescence testing. The lower sub-samples (255-11-25 and 255-11-45) were considered too dry and crumbly for reliable sampling.

Luminescence Measurements

2.9 The subsamples were dried at 105°C and sieved to isolate material of <90 μm diameter. The <90 μm fraction was treated with H_2O_2 for 24h to remove organic material and then with 15% HCl at 50°C for 24h to remove carbonates. Material of 2 - 10 μm grain size was extracted by settling in a 20 cm column of 0.01N sodium oxalate for 20 minutes, pouring off the suspension and settling this in a 20 cm column of 0.01N sodium oxalate for 4 hours. The 2-10 μm material collects at the bottom of the column during this settling. After recovering and drying this material, it was deposited by settling in acetone onto abraded 10 mm diameter aluminium discs. This provides a monolayer of material, with approximately 2 mg per aliquot.

2.10 Measurements were made in a Risø TL-DA-12 automated reader. Laboratory beta doses were administered by a calibrated $^{90}Sr/^{90}Y$ beta source mounted on the reader and alpha doses by an external calibrated ^{241}Am foil. Infrared stimulation was provided by an array of IR diodes within the reader. The luminescence was detected by an EMI photomultiplier with a Schott BG39 filter used to isolate the blue luminescence from the stimulating IR light.

2.11 Aliquots were normalised by a 1s exposure to infrared light; correction was subsequently made for depletion of the signal due to this normalisation measurement. The palaeodose was determined from measurements made using the additive dose technique (Aitken 1985). Following irradiation, aliquots were preheated to 220°C for 10 minutes to remove the component of the signal unstable over archaeological time scales. IR stimulation of 250 s duration was sufficient to reduce the signal to within 5% of the background signal. The

background, comprising photomultiplier dark count and breakthrough from the IR diodes, was measured by an extended (2000 s) stimulation of one aliquot.

Dose rate measurements

2.12 Laboratory measurements using beta TL dosimetry (Bailiff 1982) and thick source alpha counting were used to calculate the annual dose. No radon loss was detected using thick source alpha counting of sealed and unsealed samples from any of the samples tested and secular equilibrium has been assumed. The 'as-dug' water content and the organic content of the sediments were measured in the laboratory by successive heatings to 105°C, 500°C and 900°C. The total dose rate was corrected for both the water and the organic content of the sediments.

Age calculation

2.13 The luminescence age is determined from the Age Equation:

- $$\text{Luminescence Age (years)} = \frac{\text{Palaeodose (Gy)}}{\text{Dose rate (Gy / year)}}$$

3. Quantifications

3.1 In total, six subsamples, three from each of the two locations, were selected for testing.

4. Provenance

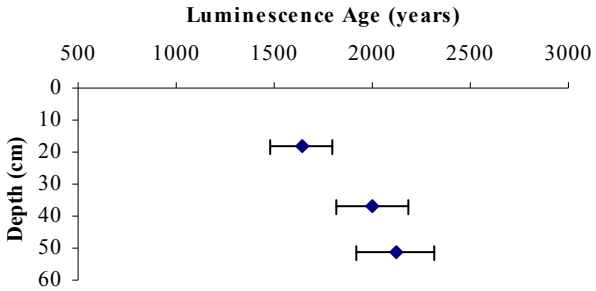
Location 1

4.1 Three sub-samples of sediment beneath the sarsen stones were tested: from 0.38m (255-6-25), 0.58m (255-6-45) and 0.87m (255-9) below the top of the section. Subsample 255-6-25 was from fine sediments above the layer of medium-sized (<8 cm) flints; while subsample 255-6-45 was from just below this flint layer. Sub-sample 255-9 was from the manganese stained layer.

4.2 Palaeodoses of ~150 Gy and ~300 Gy were obtained for sub-samples 255-6-25 and 255-6-45, indicating ages in excess of 50 ka for both samples. This, together with the younger date for the lower sample (255-9), suggests that the sediments were not well bleached at the time of deposition and no further measurements were made on these samples. A palaeodose of ~40 Gy was obtained for 255-9, indicating an age of 13 – 19 ka. The luminescence age for 255-9 may reflect the time of deposition, but this cannot be tested and no further measurements were made on this sample.

Location 2

4.3 Sub-samples from 0.18m, 0.37m and 0.51m below the top of the section of the pit/well were selected for dating. The section was *c*1m deep but, unfortunately, samples taken from the lower part of the section were unsuitable for luminescence dating being very dry and crumbly.



4.4 The dates for the upper part of the fill indicate a gradual silting up of the pond and give a terminus ante quem of 120 BC ± 200 for the start of infilling.

5. Conservation

5.1 No conservation is necessary.

6. Comparative material

6.1 The luminescence date is given with associated errors at the 68% level of confidence. Both the random error and the overall error are quoted; the random error should be used for inter-comparison of the luminescence dates while the overall error should be used in comparison with independent dating evidence.

7. Potential for further work

7.1 The Luminescence dates have potential to add to the corpus of dating evidence, but little potential to answer the research aims.

8. Bibliography

Aitken, MJ, 1985, *Thermoluminescence Dating*, Academic Press, London.

Bailiff, IK, 1982, 'Beta-TLD apparatus for small samples' *PACT*, **6**, 72-76.

Table 29: Assessment of Dating

Sample ref.	Luminescence date ± random error ± overall error
255-10-12	AD 360 ± 140 ± 160
255-10-30	AD 0 ± 140 ± 180
255-10-45	120 BC ± 140 ± 200

Sample ref.	Palaeodose P (Gy)	Total Dose Rate (mGy/a)	Dose rate components (%) α	β	γ	cosmic	Water content (%)	Organic content (%)	a-value
255-10-12	5.28 ± 0.24	3.20 ± 0.09	25	42	28	5	19 ± 2	3.8 ± 0.4	0.096 ± 0.008
255-10-30	5.51 ± 0.33	2.77 ± 0.08	28	38	29	5	19 ± 2	4.5 ± 0.5	0.093 ± 0.008
255-10-45	7.06 ± 0.38	3.33 ± 0.09	30	39	26	5	20 ± 2	3.1 ± 0.3	0.119 ± 0.009