THE GARDENS OF RAINHAM HALL
BROADWAY
RAINHAM, RM13 9YN
LONDON BOROUGH OF HAVERING

AN ARCHAEOLOGICAL EVALUATION AND WATCHING BRIEF

COMPASS ARCHAEOLOGY

August 2010

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Abstract

An archaeological watching brief and two-trench evaluation was undertaken in the gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering between 13th – 16th July 2010. The archaeological work was carried out as part of a regeneration scheme for Rainham Hall Gardens and commissioned by Butler+Hegarty Architects on behalf the Regeneration Team of the London Borough of Havering and the National Trust.

The evaluation trenches were designed to investigate an existing slope and terrace crossing the gardens from east-west, and to determine the nature of the construction of the feature. In the east, Trench 1 exposed underlying sloped natural deposits by which the existing slope was defined. No significant land build up or terracing was observed in this area. However, to the west Trench 2 exposed a complex sequence of deposits suggesting the slope had been artificially constructed through the dumping of made-ground layers, creating a bank similar in profile to that observed in the east. Subsequent alterations in this part of the site included two low revetment walls c.19th century and cutting back and terracing at the base of the slope followed by construction of a chain link fence later replaced by an existing concrete block wall. A shallow gravel path was recorded in both trenches at the top of the slope.

The archaeological watching brief involved the monitoring of 21 pits excavated during a programme of tree replanting around the site. The majority of the pits exposed a simple sequence of topsoil and subsoil overlying natural deposits of sand and gravel. One pit, excavated in the area of a large pond known to have existed on the site since the early 18th century (and prior to the construction of the Hall and gardens) exposed several deposits thought to relate to the later use, and subsequent backfilling of this feature c.1920s.

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Front cover: photograph of one of the pair of ornamental urns on pedestals at the rear of the Hall.

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1. Introduction

1.1 This report details the results of an Archaeological Evaluation and Watching Brief carried out in the Gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering between 13th to 16th July 2010. The site was located at NGR TQ 5216 8214 (see Figure 1 below).

1.2 The Archaeological Evaluation consisted of two trenches measuring 15.1m and 13.1m respectively, at a standard width of 1.2m. Additional Watching Brief observations and recording was undertaken on a series of 21 pits excavated during tree replanting.

1.3 This report was commissioned by Gary Butler of Butler+Hegarty Architects on behalf of the Regeneration Team of London Borough of Havering. Compass Archaeology would also like to thank Gary Marshall for monitoring the project on behalf of the National Trust.

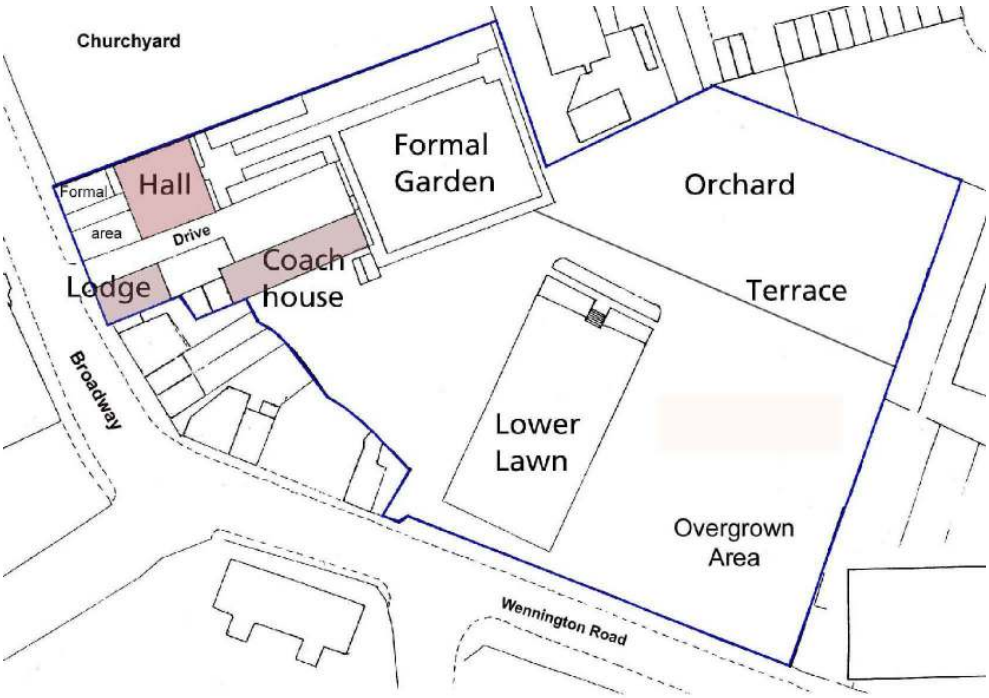


Figure 1: Site location based on the Ordnance Survey 1:2500 map.

2. Site Location and Geology

2.1 Rainham Hall and Gardens are bounded by the Broadway to the west and Wennington Road to the south. The churchyard of Rainham Parish Church of St Helen and St Giles forms the northwestern boundary, while a carpark and residential properties fronting Upminster Road South form the northeastern boundary. To the east residential properties fronting Wennington Road and St Helen's Church Hall and carpark are located in areas formerly part of the Rainham Hall Gardens.

2.2 The site is located on gently southwestward sloping land, approximately 400m to the east of the River Ingrebourne, at a surface level of about 5m above Ordnance Datum (AOD). A Topographical Survey undertaken by Butler + Hegarty Architects (Drawing No: 0910506/Sk 300-3) records the land at approximately 5.61m OD in the southwest corner by the existing Hall, rising to 5.89m in the north and sloping to 3.07m in the southeast corner. The church and Hall is situated on a natural knoll of higher land and the topography falls away to the marshes to the south

2.3 The British Geological Survey (BGS 1996 *Romford. England & Wales Sheet 257. Solid & Drift Geology* 1:50 000) indicates that the site is located on River Terrace deposits which comprise gravels which are sandy and clayey in nature. To the south and west of the site the land has been extensively quarried for gravels and brickearth.

3. Archaeological and Historical Background

3.1 Rainham Hall is an elegant compact Dutch-style three-storied house, built by Captain John Harle in 1729, and listed Grade II* (designated 1955) The current gardens occupy an area of just under three acres (1.2 hectares), with the house and associated buildings located in the west corner immediately adjacent to the churchyard of St Helen and St Giles Church, Rainham. The associated buildings are the Lodge (Grade II*), to the south dating to *circa* 1718 and to the southeast the Stables or Coach House (Grade II*), which although obviously altered is generally felt to be of a similar date to the house. The 18th century gardens originally covered an area of *circa* twelve acres (5 hectares), but the orchards to the north and east of the site were sold for redevelopment in two lots one in 1901 and another after 1939. The existing gardens incorporate formal garden areas to the front (west) and rear (east and southeast) of the house, with larger garden areas to the south laid out on two levels; the upper level is set out as an orchard and is approximately 3m higher, while the terraced garden to the south was once primarily laid out to lawn with a large pond. The gardens have become overgrown in recent years and the evaluation and watching brief were commissioned in advance of an application to restore and reinstate the gardens. The railings, gates and piers, walls and ornaments to the front and rear of the house are also listed Grade II*, and those at the front of the house are contemporary with the house dating to 1729. The railings, gates and piers at the rear of the house in the courtyard area are probably of a later date, but still form a complementary addition to the Hall. The Hall and gardens are situated at the centre of the London Borough of Havering's Rainham Conservation Area (designated 1968). The gardens are not listed on the English Heritage Register of Parks and Gardens and the site is not within a Borough designated Archaeological Priority Area.

3.2 The house and gardens stand in the heart of the historic village of Rainham and form an elegant and impressive focus to the village. The house is next to the medieval church and it has been suggested that the medieval manor house may have once stood in this vicinity. Detailed archaeological analysis shows that the area has a rich archaeological heritage primarily for the prehistoric periods, but later occupation was confined to the small rural hamlet of Rainham. The focus of the village was the church and later emphasis moved towards Rainham creek to the northwest of the village. The creek was dredged up to Rainham village by Captain Harle in the early 18th century and he established the prosperous Rainham Wharf, which allowed him to build Rainham Hall. Apart from documentary references to a smallholding on the site

in 1716 and fragmentary evidence for medieval features and pottery from archaeological investigations in 2006, there is little conclusive evidence for established settlement predating the construction of the Hall, again emphasising the rural nature of Rainham until the 18th century. Unfortunately, there is also little documentary or map evidence for the gardens during the 18th and 19th centuries although a wealth of data survives for the house itself.

3.3 The desk based assessment (Compass Archaeology: 2010) concluded that there was very little primary research material for the historic development of the gardens. The current garden layout is intrinsically very close to the garden design laid out by Captain Harle, although some elements such as the railings at the rear, the terrace retaining walls and the yew hedge are obviously of a later date. The ornamental furniture in the garden has all been relocated and paths have been replaced or realigned, these works were carried out by Colonel Mulliner in the 1920s and this may have changed the garden dynamic especially in the 'formal' areas. The exact nature of the terrace formation, sunken garden and pond feature are still uncertain although it appears they have not been much altered since the 18th century. The map evidence suggests that Harle preferred a natural park style garden in keeping with the fashions of the time, however, there are also documentary references to him creating 'long, straight paths' and forming the terrace in the 'Dutch formal style', which could suggest a more contrived layout. The assessment concluded that archaeological mitigation, in the form of the small scale targeted evaluation of the terrace area and watching brief works during the replanting programme may be sufficient to answer these outstanding research questions.

4. Archaeological Research Questions

4.1 The site presented an opportunity to address several research questions, these included (*c.f.* Section 10.1):

- What heritage features survive from the various phases of the formation of the 18th century terrace?
- What heritage features survive from the various phases of development of the historic estate and garden layout?
- What are the nature, form, function, extent and date of these features?
- Is there any evidence for features predating the 18th century terrace?
- Is there any evidence of rebuilds or later phases of the18th century terrace? Specifically, structural remains in the form of retaining walls, steps or other structural features?

5. The Archaeological Programme

The archaeological work undertaken at Rainham Hall Gardens consisted of a two-part programme of targeted evaluation trenches and additional monitoring of replanting works in the wider site. The methodology and standards for both phases of work is set out below:

5.1 The Evaluation

5.1.1 Standards

The field evaluation and post-excavation work was carried out in accordance with English Heritage guidelines (in particular, *Standards and Practices in Archaeological Fieldwork, Guidance Paper 3*). Works also conformed to the standards of the Institute of Field Archaeologists (I*f*A). Overall management of the project was undertaken by a full Member of the Institute.

The evaluation and post-excavation work followed the procedures set out in MAP II (Management of Archaeological Projects, English Heritage 1991), including assessment of the potential for further analysis.

5.1.2 Fieldwork

The field evaluation consisted of two trial trenches, located as shown on Figure 2. Trenches measured 15.1m and 13.1m respectively by 1.2m in plan at the level of potential archaeology or natural subsoil.

5.1.3 Methodology

Initial clearance of the trial trenches was undertaken by a mechanical excavator working under archaeological supervision. Deposits were generally removed in this way to the latest significant archaeological horizon, or in the absence of remains to a clean natural/ subsoil layer.

Following initial clearance archaeological deposits and features were selectively excavated and recorded in stratigraphic sequence. Additional techniques were applied where appropriate.

Archaeological contexts were recorded as appropriate on *pro-forma* sheets by written and measured description, and drawn in plan and/or section. The trench positions were recorded on a general site plan and related with appropriate accuracy to the Ordnance Survey grid.

The recording system used followed the MoL Site Manual for on-site work. By agreement the recording and drawing sheets used were directly compatible with those developed by the Museum. The fieldwork record was supplemented by photography as appropriate (35mm/digital).

The objective of the evaluation was to define the character, extent and significance of potential remains, and to recover dating and environmental evidence, rather than to fully excavate.

The fieldwork was carried out in accordance with the Construction (Health, Safety & Welfare) Regulations, and safe working conditions were assessed during the course of the evaluation. Spoil was mounded a safe distance from the trench edges, and where required hazard tape or *netlon* fencing was erected around the trenches.

Finds and samples were treated in accordance with the appropriate guidelines. All identified finds and artefacts were retained and bagged with unique numbers related to the context record.

5.2 The Watching Brief

5.2.1 Standards

The field and post-excavation work was carried out in accordance with current English Heritage guidelines (in particular, *Standards and Practice in Archaeological Fieldwork, Guidance Paper 3)* and to the standards of the Institute for Field Archaeologists *(Standard and Guidance for Archaeological Watching Briefs).* Overall management of the project was undertaken by a full member of the Institute.

The recording system followed the procedures set out in the Museum of London recording manual. By agreement with MoLA the recording and drawing sheets used were directly compatible with those developed by the museum.

5.2.2 Fieldwork

The archaeological watching brief took place during contractors treeplanting works, and involved an archaeologist on site as required to monitor works and to investigate and record any archaeological remains. Close liaison was maintained with the groundworks team to ensure a presence on site as and when necessary.

Where archaeological remains were exposed adequate time was allowed for investigation and recording, although every effort was made not to disrupt the contractor's programme. Significant remains were recorded in plan and a scaled section drawing with levels made as appropriate.

The National Trust and the representatives of English Heritage and the Local Authority were kept advised of the progress of the fieldwork, and in particular any significant finds or remains that may require additional archaeological work.

5.2.3 Methodology

Archaeological deposits and features were investigated and recorded in stratigraphic sequence, and where appropriate finds dating and environmental evidence recovered.

Archaeological deposits and features were recorded as appropriate on *pro-forma* context or trench sheets, and/or drawn in plan or section generally at scales of 1:10 or 1:20. The investigations were recorded on a general site plan and related to the Ordnance Survey grid. The fieldwork record was supplemented as appropriate by photography (35mm colour transparency/ monochrome print/ digital).

All relevant health and safety legislation, such as the Construction (Health, Safety & Welfare) Regulations 1996 and other codes of practice were respected. Risk Assessments were drawn up as necessary.

6. Post-Excavation Work

The fieldwork was followed by off-site assessment and compilation of this report, and by ordering and deposition of the site archive.

6.1 Finds and Samples

The finds retrieval policies of the London Archaeological Archive and Research Centre (LAARC) were adopted, as the LAARC is the primary recipient for all archaeological material in Greater London. All identified finds and artefacts were retained according to the stated selection, retention and disposal/discard policies appropriate to the material type and date.

All finds and samples were treated in a proper manner and to standards agreed in advance with the LAARC. They were exposed, lifted, processed, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in *General Standards for the Preparation of Archaeological Archives.*

Finds and samples were treated in accordance with the appropriate guidelines, including the Museum of London's *'Standards for the Preparation of Finds to be permanently retained by the Museum of London'*. Assessment of finds and samples was undertaken by appropriately qualified staff.

6.2 Report Procedure

Copies of this report will be supplied to the Client, English Heritage and the local planning authority and the local studies libraries.

The level of reporting was dependent on the results of the fieldwork; however this report includes details of all archaeological remains or finds, an interpretation of the deposits investigated and a site plan located to the Ordnance Survey grid. A short summary of the fieldwork is appended using the OASIS Data Collection Form, and in paragraph form suitable for publication within the 'excavation round-up' of the *London Archaeologist*.

7. The Site Archive

The records from the archaeological project will be ordered in line with MoL *Guidelines for the Preparation of Archaeological Archives* and will be deposited in the Museum of London Archaeological Archive. The integrity of the site archive should be maintained, and the landowner will be urged to donate any archaeological finds to the Museum.

8. The Archaeological Evaluation

The evaluation carried out in the gardens of Rainham Hall consisted of two trenches excavated in the south-east part of the site, along the line of the existing terracing that runs approximately northwest to southeast dividing the Orchard to the north from the Lower Lawn and overgrown areas to the south (see Figure 2 below). The trenches were orientated approximately northeast to southwest, running from the top to the bottom of the sloped and terraced bank.

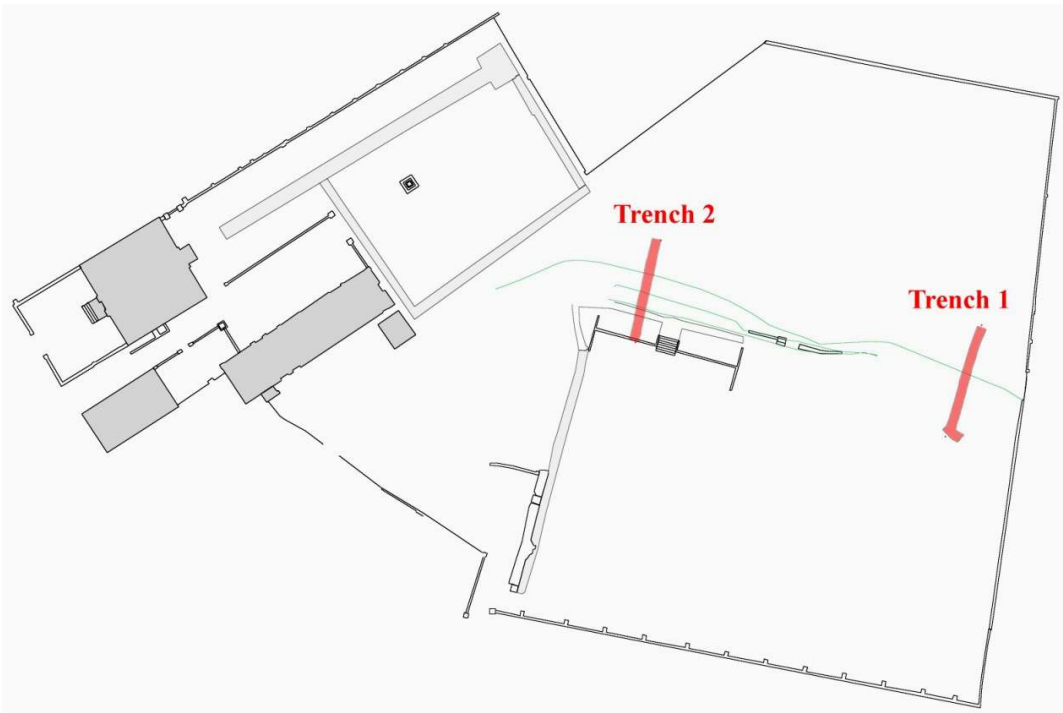


Figure 2: Trench location plan, based on an original survey drawing by Butler+Hegarty Architects (Drawing No: 0910506/SK300-3).

The slope changes in character and structure across its length, and has been subjected to varying degrees of alteration over the years. In the western half of the site the slope has been partly terraced, now consisting of two sloped banks leading to a stone path and grassed terrace supported by a concrete retaining wall and steps (see Figure 3 below). The area was landscaped in this manner in the first half of the 20th century to accommodate a tennis court (shown on the Ordnance Survey map of 1939), although the exact date of the works is not known. At the top of the bank the ground is recorded at *c.* 5.69m OD falling to *c*. 4.20m OD on the stone path. The top of the concrete retaining wall is at *c.* 4.01m OD, and the top of the stairs at 4.00m OD falling to 2.95m OD at the base. Trench 2 was excavated across this sequence of terraces, the southern end located approximately 3m to the left (west) of the base of the steps.

Figure 3: The 20th century terraces, concrete retaining wall and steps to the Lower Lawn, looking northeast.

In the approximate centre of the existing bank a brick-lined bastion planted with three large yew trees currently stands. The yew trees stand at the top of the terrace at *c.* 5.69m OD, at the same level as the top of the bank to the west above the Lower Lawn terraces. The level then drops to *c.*4.78m OD at the base of a modern dry-laid brick wall, set in toothed or Honeycomb brickwork design (probably for drainage). Within the wall a set of 20th century red brick on-edge steps is constructed (see Figure 4 below). The level at this point is slightly above that of the stone path on the terrace to the west, but here the ground is then gently sloped as opposed to terraced, eventually leveling off to the approximately the same height as the Lower Lawn to the west.

Figure 4: The bastion planted with yew trees and retained by a Honeycomb dry-laid brick wall and red-brick steps.

In the eastern half of the site the bank shows no evidence of deliberate terracing or reshaping. Here the land slopes from 5.70m OD at the top (north) to *c.* 3.00m OD at the base (south). The area is very overgrown, known as the 'Wilderness' and featuring numerous mature trees and large areas of brambles and scrub (see Figure 5 below). Trench 1 was located in this area, running from the top of the slope and located approximately 6m from the existing boundary wall to the east.

Figure 5: The sloping bank in the eastern half of the site, very overgrown.

8.1 Trench 1

Located in the eastern half of the site, Trench 1 was excavated on an approximate northeast to southwest orientation across the existing sloped bank (see Figure 2 above). The trench was designed to investigate whether the existing slope showed evidence for artificial build up of the land or another form of terracing. Trench 1 measured 15.1m by 1.2m in plan, with an additional 1.2m at the southwestern end where the trench was dog-legged to avoid existing trees.

8.1.1 List of Recorded Contexts

Context	Description	Interpretation
1	Loose, dark grey-brown silt and clay soil with frequent roots and rounded pebbles, average of 0.2m thickness across trench.	Garden/Top-Soil recorded across Trench 1.
2	Firm light grey-brown silt with clay, moderate small-medium flint pebbles, 0.15m thickness at top of slope becoming thicker down slope to 0.3m at base.	Subsoil recorded across Trench 1 (cut by path [4] (3) and bedding soil (6)).

3	Moderately compact light-grey brown sand and silt with very frequent flint pebble inclusions. Bordered by large rounded flint nodules in two parallel lines.	Gravel path in cut [4] crossing Trench 1 at top of slope on approximate northwest-southeast orientation.
4	Linear cut exposed crossing trench northwest-southeast, *c.* 1.6m in width, edge marked by parallel lines of large rounded flints, c.0.25m in depth.	Cut of gravel path [3].
5	Compact light brown to orange gravels and sandy clay.	Natural sand and gravels.
6	Loose dark-brown silt and clay with moderate rooting and occasional rounded pebbles. Average depth of *c.* 0.4m, recorded in linear cuts either side of path [4][3] *c*.0.4m in width.	Probable bedding soil recorded either side of and cutting path [4][3].

8.1.2 Stratigraphic Matrix

8.1.3 Summary and Discussion

Trench 1 exposed a recent garden or top-soil deposit [1] which overlay a subsoil deposit [2] for the majority of the trench. However, in the northern end of Trench 1, at the top of the existing slope, a gravel path [4][3] was observed cutting subsoil deposit [2]. This was in turn cut by [6], bedding soils laid either side of the path and cut into the edges to the north and south. Natural gravels and sand [5] were observed in the base of excavations from *c.* 6.2m along the trench from the northern end (*c*.2.6m south of the southernmost path edge), beginning at a height of 4.46m OD and sloping down to a height of 2.59m OD in the southern end of Trench 1. The recorded deposits and features in Trench 1 are shown in plan and section in Figures 6 and 7 below.

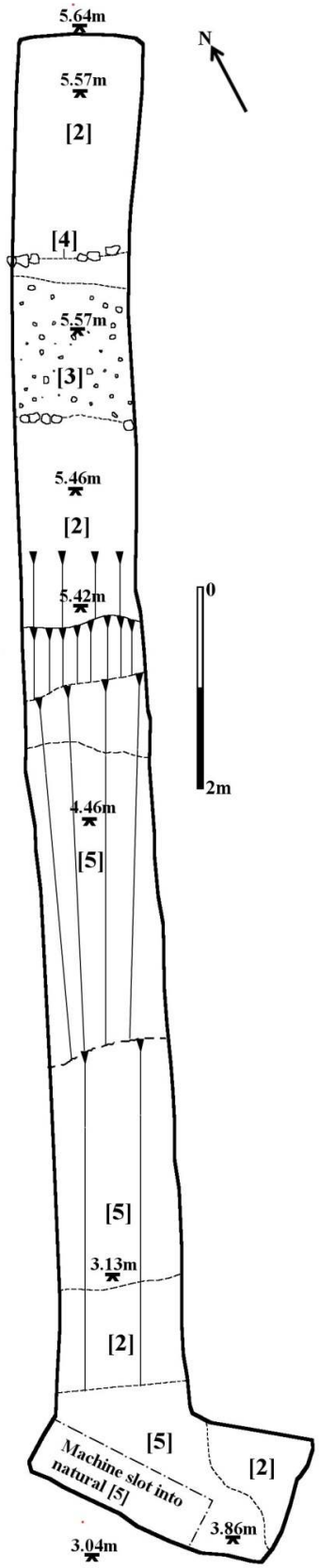


Figure 6: Plan of Trench 1.

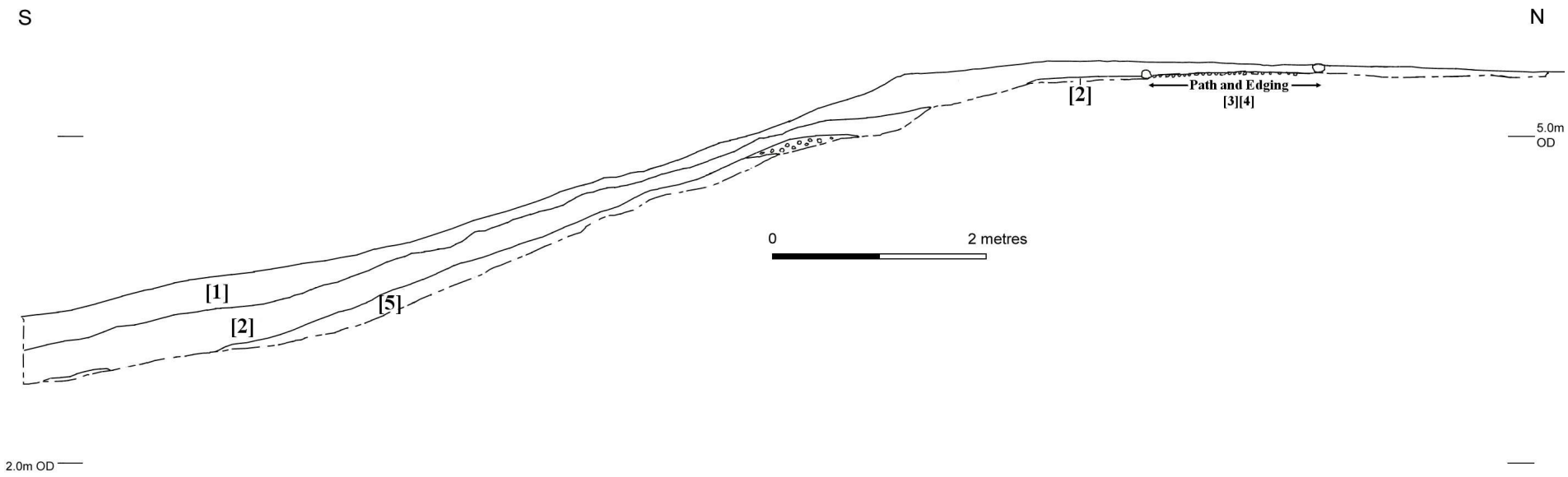


Figure 7: Section of Trench 1.

No evidence for significant building up of the land or other form of terracing was observed in Trench 1, although evidence for some minimal landscaping is possible. It is unclear from the results of the archaeological evaluation whether the natural deposits recorded sloping from north to south represent a natural topographic feature (possibly predating the garden) or whether they have been cut back or sculpted to form the existing bank.

The natural gravels [5] were overlain by subsoil deposit [2] which was in turn cut by the path [3][4]. As no finds or datable material were recovered from the fill [3] of path [4], it is impossible to accurately date the feature or fit it into the timetable of development of the garden. The bedding deposits [6] were clearly a subsequent addition to the path, as they cut the path deposit [3] itself, although at exactly what stage in the process this modification occurred remains unclear. As both the path features and subsoil were directly overlain by topsoil [1], subsoil [2] must represent either an original surface garden soil contemporary with or earlier than the path (both later overlain by topsoil), or a significantly earlier deposit, originally considerably thicker or overlain by other deposits, which was exposed during reduction or cutting back of the slope and subsequent laying out of the path. If the existing topsoil and subsoil were contemporary, the path would not lie stratigraphically between the two deposits, and similarly the upper horizon of the subsoil and path must both have been exposed at the same time in order for topsoil [1] to accumulate above. Whether the path and possible landscaping were contemporary with the original layout of the gardens, or represent later activity is unclear due to the lack of datable material recovered from deposits. However, the survival of the flint path edging so near the surface suggests it was a more recent addition, and not contemporary with the original early 18th gardens.

Figure 8: View of the south end of Trench 1 looking northeast (0.6m scale).

Figure 9: View of the north end of Trench 1 showing path [3][4] with flint edging in plan, looking south down the slope (1m scale).

Figure 10: Detail of the initial slot through path [4] and associated fill [3] and bedding soils [6], looking east (0.2m scale) – subsequent excavation was recorded in section (Figure 11 below) to a depth of 1.25m below the existing ground surface.

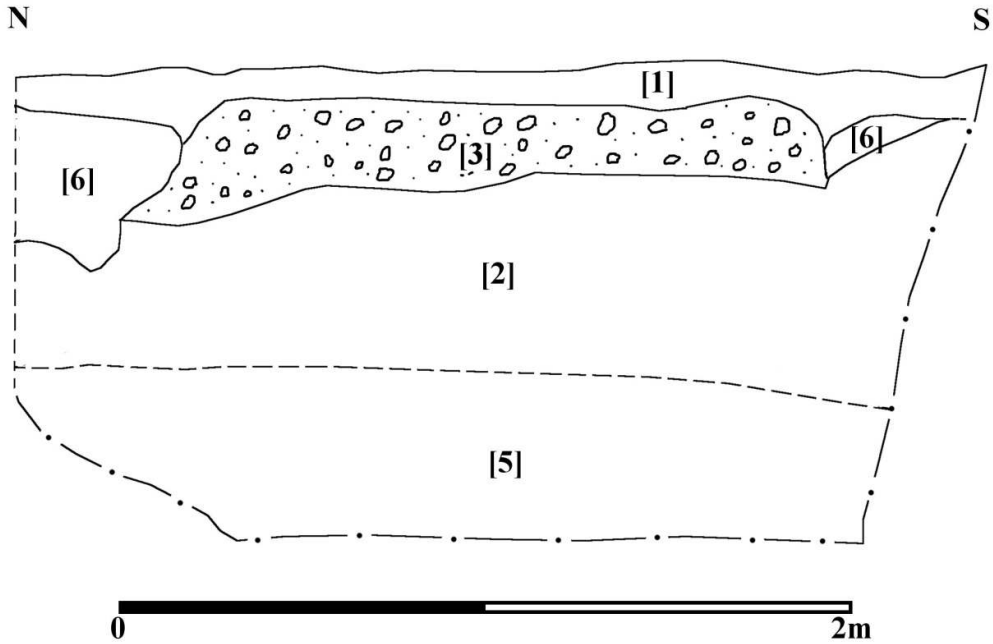


Figure 11: Section through path [4] and associated fill [3] and bedding soils [6], into natural gravels [5].

8.2 Trench 2

Trench 2 was excavated in the western part of the gardens, orientated northeast to southwest and measuring 13.1m by 1.2m in plan. The trench was located across the existing terraces, running from the top of the bank (5.70m OD) down an initial slope to a low retaining wall, down a further slope onto the terrace retained by a concrete block wall at the southern end of the trench (base at 2.83m OD). Natural sands and gravels were recorded at 4.90m OD in the north end of the trench (below path deposits), 2.9m OD midway down the slope and 1.9m OD at the base of the slope.

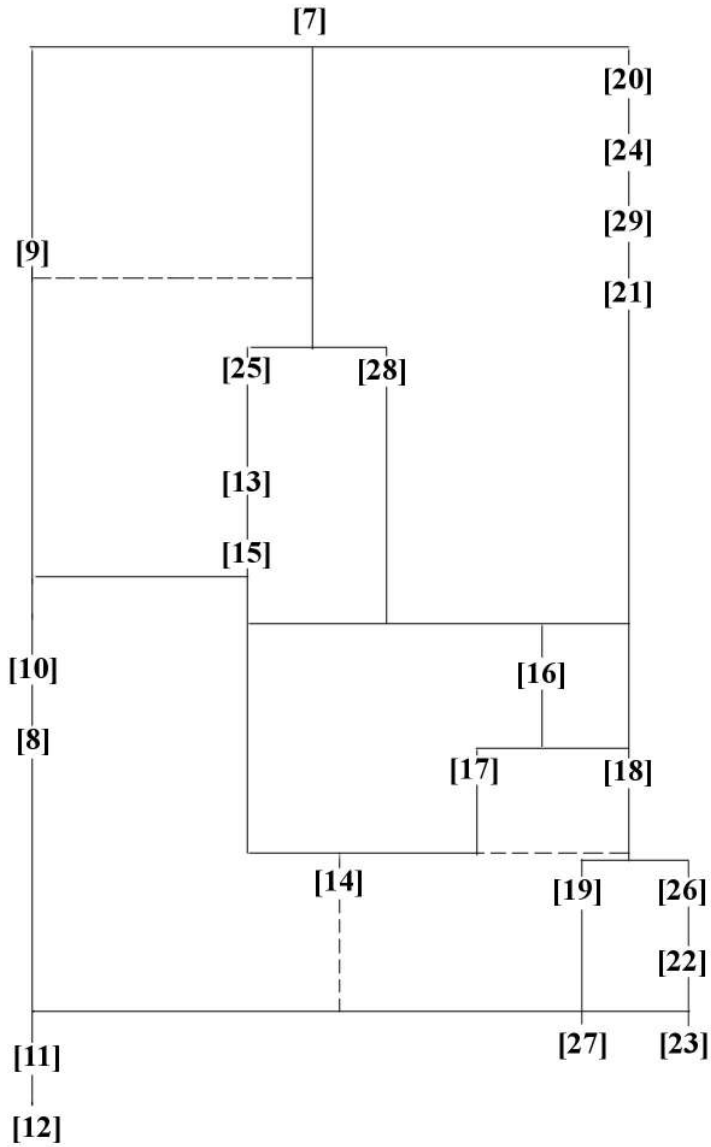
8.2.1 List of Recorded Contexts

Context	Description	Interpretation
7	Dark grey-brown sandy silt with mottled lighter clayey patches, moderate pebbles and rooting throughout observed across whole trench. Small flint bladelet recovered.	Topsoil and underlying shallow subsoil deposit.
8	Mid grey-brown sandy silt with occasional pebbles recorded below topsoil [7] at north end of trench. Single residual sherd of mid-12th century pottery recovered.	Subsoil at north end of trench, cut by path deposits [9] [10]
9	Gravel pebble-bed in silty matrix, shallow and poorly defined at north end of trench, *c.* 1.1m in width.	Gravel path at north end of trench.

10	Mid grey-brown silt and clay with gravel inclusions, overlying natural deposit [11].	Buried soil/made-ground deposit associated with path [9].
11	Light orange-brown gravels and sand.	Natural sand and gravels.
12	Coarse orange-brown sand and gravels.	Natural sand and gravels.
13	Firm mid grey-brown silty sand with pebbles and occasional mortar fragments, recorded initially at top of slope and continuing down hill.	Made-ground deposit. Possible later consolidation of bank following construction of path [9].
14	Compact silty-sand and gravels.	Probable made-ground deposit below [13], part of 18th century bank construction.
15	Fine sand and ash deposit with clinker in small u-shaped cut on east side of trench.	Cut and fill of small ash-filled pit, probably contemporary with bank construction *c.*18th century.
16	Compact mid-brown silty sand with occasional pebbles and chalk flecking.	Made-ground deposit. Probably part of 18th century bank construction.
17	Concentration of animal bone with bored hole along length, in light-brown silty clay matrix with frequent pebbles.	Animal bone? Possible part of made-ground [16] and overlying [14]. Part of bank construction?
18	Compact gravels and silty sand beneath [16]. Single sherd of 15th century pottery recovered.	Made-ground deposit beneath [16].
19	Concentration of animal bones with bored hole similar to [17], recorded below made-ground [18]. Two sherds of early-17th pottery recovered.	Animal bone?
20	Mixed clay and silt fill behind wall [24].	Construction fill to level bank behind revetment wall [24]
21	Compact mid-brown silty sand beneath [20].	Buried surface/soil associated with chain link fence [29].
22	Dirty gravels and silty sand mixed deposits.	Made-ground deposit, probably associated with 18th century bank construction, or earlier infilling (possibly gravel extraction).
23	Loose yellow-orange sandy gravel, similar to [12].	Natural sand and gravels (see discussion below for possible evidence of backfill deposits and gravel extraction).
24	Concrete block wall over continuous footing at base of slope.	Retaining wall at base of terrace.
25	Flint nodules set over brick and concrete base, part of continuous E-W line along bank.	Low retaining wall creating slight terrace in bank.
26	Compacted surface beneath [18].	Possible buried surface relating to construction of bank – sealing made-ground [22] and sealed by [18].

27	Yellow-orange sand and gravels similar to [23] and [12].	Natural sand and gravels (see discussion below for possible evidence of backfill deposits and gravel extraction).
28	Line of flint nodules similar to [25] but further down slope and with no footing or base.	Low retaining wall creating slight terrace in bank.
29	Remains of chain link fencing and metal post.	Fence at base of slope replaced by concrete retaining wall [24].

8.2.2 Stratigraphic Matrix



8.2.3 Summary and Discussion

The sequence exposed in Trench 2 was substantially more complex than that exposed in the excavation of Trench 1. Trench 1 showed that the existing bank and slope in the eastern half of the site was defined by the topography of the underlying natural deposits; whether these deposits were cut back or sculpted to form the surviving slope is unclear, but what is certain is that no substantial build up of land or terracing was undertaken to create the feature. In stark contrast, in the eastern part of the site, in the area of Trench 2, large deposits of made-ground were dumped on top of the underlying natural topography in order to artificially shape the slope. As discussed below, it is likely that this build up of land is 18th century in date, contemporary with the construction of the Hall and laying out of the gardens, and that it was undertaken to continue the line of the sloping bank evident in the east across the whole garden. Subsequent alterations were made to the bank in the 20th century, shown in Trench 2 by two low flint retaining walls and the existing concrete retaining wall and terrace, which was apparently pre-dated by a chain link fence exposed during excavation. The complex relationships and variety of deposits exposed in Trench 2 are discussed below, summarised into broad phases of activity.

Pre-1729 Garden gravel quarrying

There is no definitive evidence for the quarrying of gravel in the area of Trench 2, although the loose and sterile nature of supposed natural deposits [23] [27] [11] may indicate redeposition or backfilling following excavation. Furthermore, gravel quarrying is known to have taken place in the surrounding area, and it is possible that similar work was carried out prior to the construction of the Hall and laying out of the gardens. Therefore, although no definitive evidence was recovered, it is possible that the natural topography recorded in Trench 1 originally continued into the area of Trench 2 but was excavated and subsequently built up to re-establish the bank and slope. Figure 14 below shows a section of Trench 2 with the projected line of natural deposits indicated in blue, this line represents a possible continuation of deposits [23] [27] [11] in the unexcavated area, and is based on the presumption that these are indeed undisturbed natural deposits and that no significant quarrying or disturbance had taken place.

Bank and slope construction contemporary with the 1729 Hall and Garden

The excavated sequence of deposits suggest that, prior to 20th century alterations and terracing, a bank and slope similar to that recorded in Trench 1 was built up through the deposition of deposits [13] [16] [18] [14] [26] [22] [10]. Figure 14 below shows a section of Trench 2 with the profile of this slope indicated in yellow, and by the upper horizons of deposits [13] and [16]. The profile of this slope is similar to that exposed in Trench 1, but in contrast it is not shaped by underlying natural deposits but artificially by made-ground deposits. It is likely that all these deposits are contemporary with each other, and with the first establishment of the gardens in the early 18th century. However, no definitive dating material was recovered from them. Deposit [18], recorded towards the bottom of the slope, produced a single sherd of Colchester Slipware, pottery of the 15th century, although this is clearly residual. Similarly, deposit [19], a concentration of worked animal bone beneath [18] produced pottery of medieval date, but also of 17th century date. While these finds suggest

activity of the medieval period and earlier 17th century, in context they are clearly residual and no further datable material was recovered. Deposit [26] recorded at the south end of the trench, sealing made-ground deposit [22] and sealed by [18], was very compacted and clearly represents a buried surface. It is possible that this surface is contemporary with the construction of the bank itself, and thus possible that deposit [22] represents a slightly earlier phase of infilling or consolidation (possibly contemporary will the end of gravel quarrying work).

Deposits [17] and [19] were discrete concentrations of animal bones recorded immediately below deposits [16] and [18] respectively. The two assemblages consisted for the most part of cattle metacarpals. The proximal end of these bones had a single drill hole, with evidence of three differently sized drill bits through the medial half of the proximal end, at diameters of *c*.9 – 13mm. It has been suggested that the holes may have been positioned there as part of the preparation of the hide in the tanning process. It is possible, therefore, that these bones may have been related to the two tanneries known to have existed in Rainham in the 16th century and were redeposited here perhaps as an source of nutrients to plant bedding trenches, or to aid drainage. It is difficult to assign a practical purpose to the use of the bone in these locations. What is especially interesting is that the bone is the same - cattle metacarpals with drilled holes - as encountered in the 2006 Watching Brief works, which were used to line paths closer to the Hall (*c.f.* Marshall, G. 2006; Appendix IV: Bone Report and Reilly, K. 2006).

Path construction *c.*19th century

Deposit [9] represents a shallow and poorly preserved layer of gravel recorded in an east-west orientation crossing the trench at the top of the bank, *c.*1.1m in width. This deposit is thought to be the continuation of the gravel path recorded in Trench 1 [3][4] that run along the top of the slope crossing the gardens. The path is poorly preserved in comparison to that recorded in Trench 1, and no evidence of the flint border recorded to the east survived. A small slot was excavated through the path deposit [9] which was shown to overlay made-ground deposit [10], in turn overlain by deposit [13]. It is likely that deposit [10] is part of the bank construction, contemporary with deposits [14] [18] [13] [16] and below, and not deposited as part of the path construction. The date of construction of the path is unclear as no datable material was recovered – it is possible that, as if with Trench 1, it represents modifications to the gardens in the 19th century.

Flint revetment walls *c.* mid-late 19th century

Contexts [25] and [28] represent parallel low revetting walls constructed in flint, creating slight steps or terraces in the bank. Wall [25], the more northerly of the two, was of more substantial construction, with flint nodules set on a brick and concrete base. Wall [28], while similarly constructed in flint, had no foundation base. Both walls are likely to be contemporary and represent modifications to the slope in the 19th century. As with the path, no datable material was recovered to allow for a more precise timeline, and it is unclear whether these three modifications are entirely contemporary or represent different phases of modification.

Fence and retaining wall *c.* 20th century

The bank and slope underwent considerable alteration in the 20th century. The base of the slope appears to have been cut back and a chain link fence installed, indicated by deposit [21] and the remnants of the fence and metal post [29]. These alterations are thought to be earlier 20th century in date, and were subsequently removed and replaced by the existing concrete retaining wall [24]. The construction of this feature involved substantial cutting back of the slope, as shown by the extent of deposit [20], the construction backfill used to level the new terrace. The original cutting back of the slope and installation of the fence is probably contemporary with construction of a tennis court shown on Ordnance Survey maps by 1939. However, the concrete retaining wall, originally thought to be contemporary with the tennis court, is clearly somewhat later, possibly *c.* 1950s as evidenced by the backfill behind the wall which contained plastic piping, *etc*.

Topsoil [7]

Whether topsoil deposit [7] was a natural accumulation of material or a deliberately deposited material following construction of retaining wall [24] is unclear. No datable material was recovered from the context which overlay the entire trench, but it is certainly of very recent origin. A single small broken flint bladelet of prehistoric date was recovered, but this is most certainly residual.

Figure 12: Trench 2 looking northeast up the existing bank (1m scale).

Figure 13: Trench 2 looking southwest down the existing bank (1m scale).

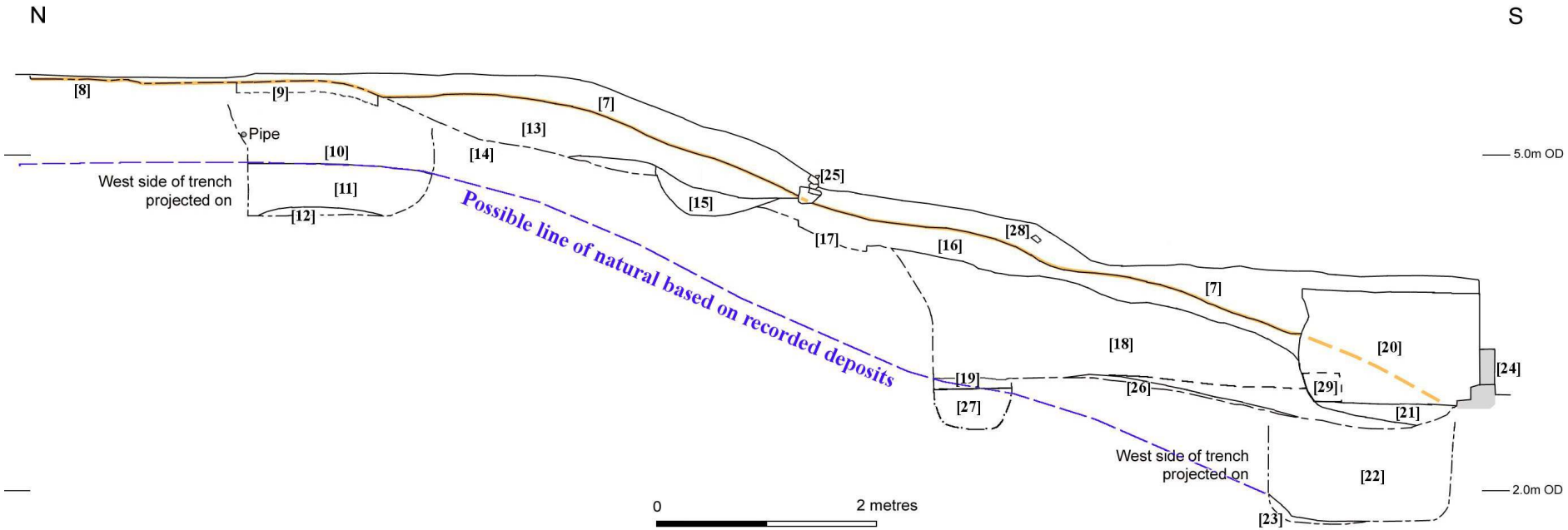


Figure 14: Section of Trench 2 (yellow line indicates line of slope prior to 20th century alterations).

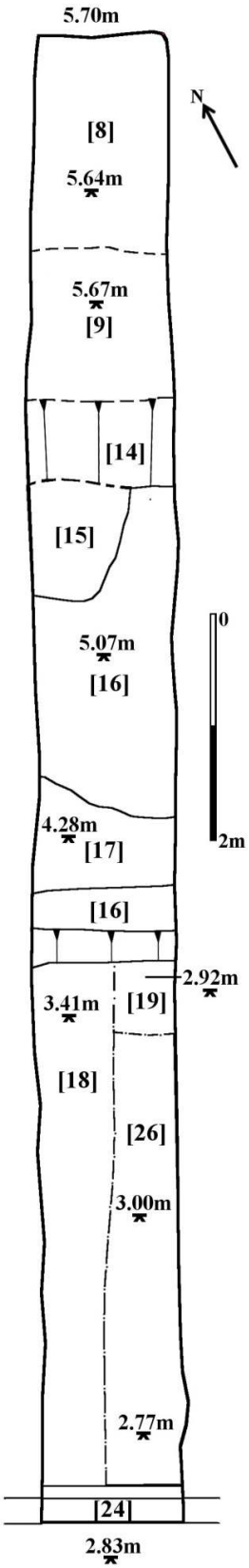


Figure 15: Plan of Trench 2.

Figure 16: West facing section of Trench 2 showing bank construction deposits (1m scale).

Figure 17: In-situ animal bones in deposit [19] (0.2m scale).

Figure 18: In-situ animal bones in deposit [17] (0.2m scale).

9. The Watching Brief

9.1 The archaeological watching involved the monitoring of 21 small pits excavated by contractors during a tree replanting scheme underway across the gardens. Of the 21 pits only one produced results of any significance, these are discussed in detail below (9.3: Pit 17). The remaining pits recorded simple sequences of topsoil overlying subsoil and natural gravel deposits. The dimensions and observations of all pits are recorded in the Table below (9.2), and the locations are shown on Figure 19 below.

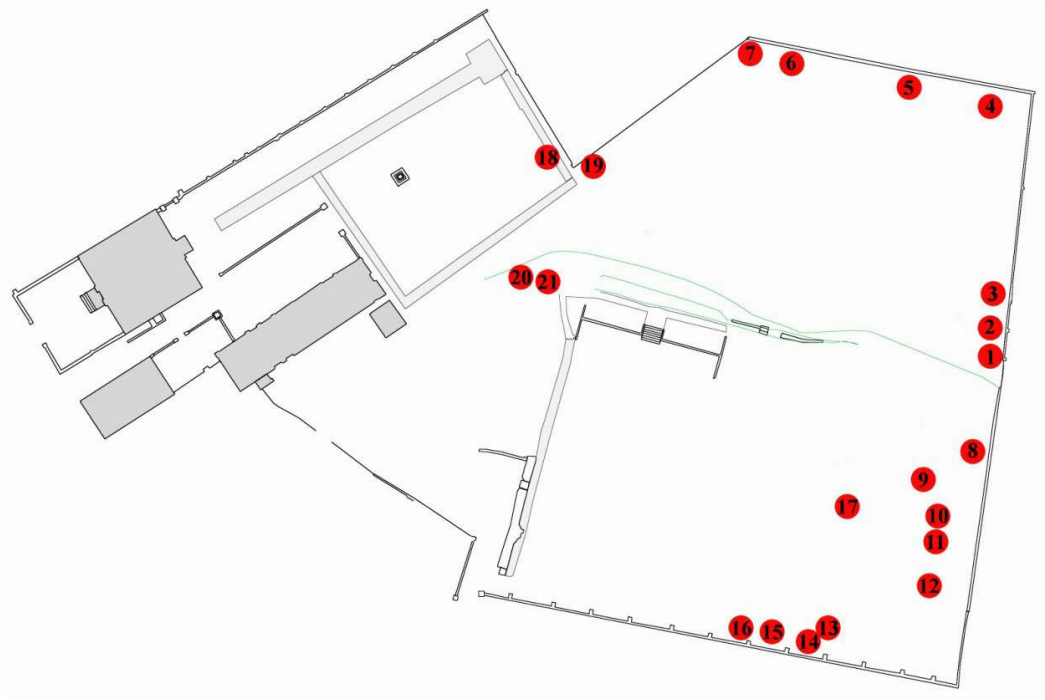


Figure 19: Tree pits locations in relation to a site plan based on an original survey drawing by Butler+Hegarty Architects (Drawing No: 0910506/SK300-3).

9.2 Tree Pit Dimensions and Recorded Stratigraphy

Pit	Dimensions (m)			Observations
	EW	NS	Depth	
1	0.85	1.2	0.55	0.10m of topsoil overlying 0.15m of subsoil, natural gravels to remaining depth.
2	0.70	1.2	0.50	Dark silty topsoil and subsoil overlying natural gravels at *c.*035m below ground surface. Iron fence post sunk through deposits.
3	0.85	1.00	0.55	Fine sandy brown-grey topsoil to 0.35m, dark subsoil becoming gravelly to base.
4	1.10	0.75	0.55	0.35m of grey topsoil and subsoil, mottled orange sandy natural to remaining depth.
5	1.30	0.90	0.60	Grey-brown topsoil and subsoil overlying 0.2m dirty natural orange deposit flecked with pebbles becoming cleaner and more yellow/light brown to base.
6	0.75	1.40	0.75	0.4m of topsoil overlying 0.2m of subsoil with ceramic tile inclusions overlying light yellow to grey-brown natural with occasional gravel inclusions.
7	0.70	1.25	0.65	Topsoil overlying dirty subsoil with flecks of chalk and lime becoming cleaner and lighter brown to base.
8	1.20	0.70	0.55	0.22m of topsoil overlying light brown subsoil with chalk and charcoal inclusions, becoming lighter brown and sandier to base.
9	0.75	1.30	0.55	0.42m topsoil overlying subsoil and natural sand and gravels to base.
10	1.35	1.00	0.60	0.33m of topsoil overlying sandy silt with clay and lenses of compact yellow clay/silt – natural.

11	0.75	1.10	0.50	Topsoil overlying compact yellow sandy gravel natural.
12	0.65	1.00	0.5	Topsoil and subsoil overlying compact darker silt layer onto natural.
13	1.00	0.75	0.70	Topsoil with modern rubbish inclusions overlying silty subsoil and yellow sandy gravel natural to base.
14	1.00	0.80	0.70	Topsoil with modern rubbish inclusions overlying silty subsoil and yellow sandy gravel natural to base.
15	1.30	1.20	0.75	Mixed topsoil with modern rubbish inclusions for full extent of excavation.
16	1.00	0.75	0.50	Mixed topsoil with modern rubbish inclusions for full extent of excavation.
17	1.40	1.40	1.00	See discussion Section 9.3 below.
18	0.81	0.51	0.43	0.32m of topsoil with rooting and pebble inclusions overlying finer grey-brown silty subsoil.
19	1.20	0.80	0.55	0.43m of humic mid-brown orchard topsoil overlying orange-brown sandy subsoil with occasional gravel.
20	0.75	1.20	0.65	Mixed topsoil overlying light-brown subsoil becoming gravelly to base.
21	0.80	1.20	0.55	Mixed topsoil overlying light brown subsoil with occasional pebbles and rooting.

9.3 Pit 17

Pit 17 was excavated in the area of a former pond that is known to have existed on the site prior to the construction of Rainham Hall. Rainham rate books of 1716 record the presence of a 'fishpond' (Compass Archaeology: 2010) on the site, and a large pond is shown on cartographic sources until 1892, Figure 20 below shows the pit locations with the pond extracted from the Ordnance Survey map of 1892 overlaid in blue. It was presumably backfilled between 1892 and 1920 as there is no pond illustrated on the Ordnance Survey map of this date. The deposits recorded in the section of Pit 17 are listed below.

Context	Description	Interpretation
30	Mid-brown silty clay with heavy rooting and pebble inclusions, 0.16m thickness.	Topsoil
31	Mid-light brown clayey soil with silt with heavy rooting and pebble inclusions, 0.48m thickness.	Subsoil
32	Mid-light brown silty clay with some rooting and gravel inclusions.	Uppermost deposit relating to the 18th century pond.
33	Very dark brown-black silty soil with occasional rooting and gravel, several large flint nodules.	Pond deposit
32	Pale grey-blue clay, mottled with lense of orange clay to upper horizon, occasional gravel and minimal rooting.	Pond deposit
35	Mottled grey brown deposit of silty sand with patches of compact orange and blue clay, becoming darker to base.	Pond deposit

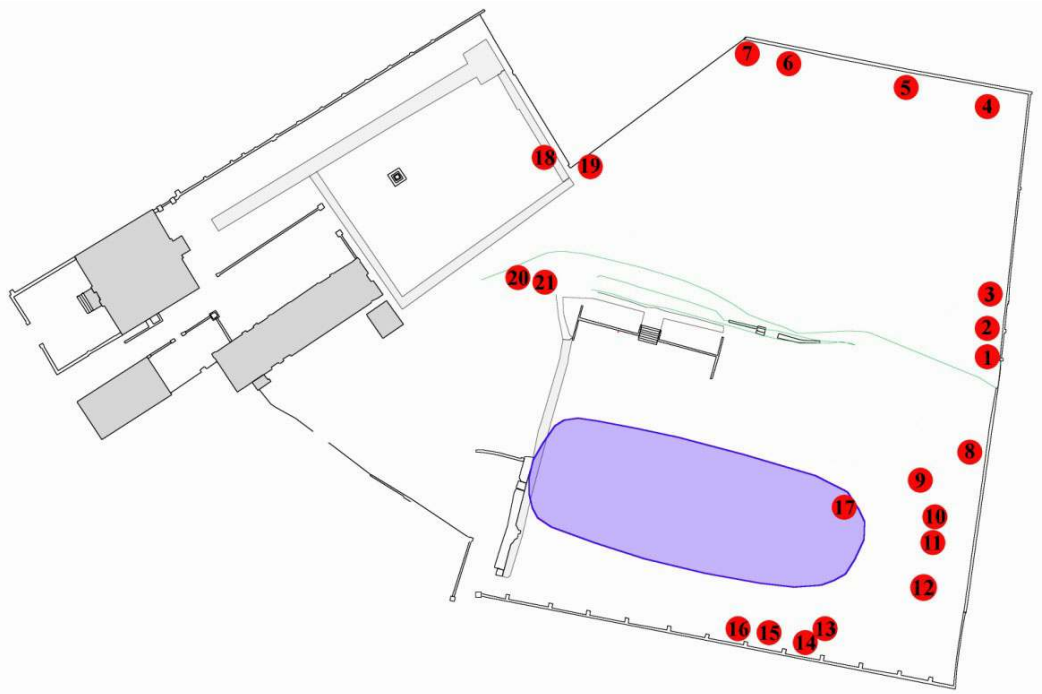


Figure 20: The location of the 18th century pond as shown on the Ordnance Survey map of 1892 in relation to the existing site.

Figure 21: Tree pit 17 (1m scale)

The four deposits exposed at the base of Pit 17 [32] [33] [34] [35] are remnants of the pond known to have existed on the site from as early as the first part of the 18th century. However, pottery and glass recovered from context [35] are of comparatively recent date, *c.*1920s and later, and as such it is likely that these deposits reflect the later use of the feature or backfilling some time before 1939. Several sherds of recent porcelain and a small brown whisky glass were recovered, all of which can be reliably dated to the early 20th century.

10. Summary and Conclusions

10.1 Archaeological Research Questions

The evaluation and watching brief provided the opportunity to answer the archaeological research questions as outlined in the WSI as follows:

- *What heritage features survive from the various phases of the formation of the 18th century terrace?*
- *What heritage features survive from the various phases of development of the historic estate and garden layout?*
- *What are the nature, form, function, extent and date of these features?*

  It is probable that the formation of the terrace as set out by Captain Harle has been recorded in Trenches 1 and 2 and the bone deposits may be heritage features contemporary with the setting out of this terrace. The nature, form, function and extent of these features has been recorded, however, it has not been possible to precisely date the formation of the terrace and associated features.

- *Is there any evidence for features predating the 18th century terrace?*

  There is no obvious evidence for features predating a 1729 date for the terrace.

- *Is there any evidence of rebuilds or later phases of the18th century terrace? Specifically, structural remains in the form of retaining walls, steps or other structural features?*

  In Trench 2 there was evidence for rebuilding and alteration to the terrace profile as summarised below.

10.2 The archaeological evaluation trenches excavated across the existing bank and slope exposed very different profiles from east to west. Trench 1, excavated in the east, showed that the existing slope was defined by underlying sloping natural deposits with no significant build up of the land or other form of terracing. It remains unclear whether the natural deposits were cut back of sculpted to form their existing profile but it is likely that the surviving slope is largely similar to that of the original 18th gardens. In contrast, Trench 2, excavated in the western half of the site exposed a sequence of significant ground make-up and later alterations. Possible evidence for quarrying or reduction of the natural was observed, with subsequent build up through dumping of several made-ground layers to form a slope similar in profile to that observed in Trench 1. It is likely that this build up of land is contemporary with the first lay out of the gardens in the early 18th century. Subsequent alterations were made to the slope from the mid-19th century; a path was recorded running east-west across the top of the slope which was also recorded in Trench 1 to the east. Two small flint revetment walls were constructed at mid-points down the slope in Trench 2, creating slight steps or terraces in the bank. More recently, the base of the slope was cut back to create the existing terrace and drop to the sunken lawn. The first phase of terracing was retained by a chain link fence, probably *c.* 1920s which was subsequently replaced by the existing concrete block wall. The construction of the latter is likely to be later than initially thought, *c*. 1950s or at least post-World War II.

10.3 The archaeological watching brief recorded a series of 21 pits excavated during a replanting scheme across the site. The majority of pits recorded simple sequences of topsoil and subsoil deposits overlying natural sand and gravels. One pit, No.17 exposed deposits relating to a pond that is known to have existed on the site since the early 18th century, predating the construction of the Hall and formal gardens. However, the deposits recorded are likely to belong to the latter phase of use of the feature, or possibly backfilling at some point between 1892 and 1939, probably towards the later part of this date range.

11. Bibliography

Butler + Hegarty Architects. 2010. *Full Topographical Survey of Current Garden. Drawing No's: 0910506/Sk 300-3.*

Butler, G. 2010 *forthcoming Historic Building Record of Rainham Hall*

Compass Archaeology Ltd. 2010. *Written Scheme of Investigation for a Programme of Archaeological Evaluation and Watching Brief Works in the Gardens of Rainham Hall, Rainham, London Borough of Havering.*

Compass Archaeology Ltd. 2010. *The Gardens of Rainham Hall, The Broadway, Rainham, London Borough of Havering: An Archaeological Assessment.*

Cooper, N. 2008 '*The Coach House Rainham Hall'* unpublished report for the National Trust (NT reference no. SNA 63268 153002 Event No. EVA 5667)

Eburne, A. May 2009 '*The Gardens of Rainham Hall, Essex. A Conservation Statement'* unpublished report for the National Trust

Lewis, F. *A History of Rainham, with Wennington and South Hornchurch* (1966)

Marshall, G: . 2006. Two reports describing the Watching Brief over Trenches 1-7 At Rainham Hall, Essex. National Trust

Appendix I: OASIS Data Collection Form

OASIS ID: compassa1-80970

Project details

Project name	The Gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering
Short description of the project	Two-trench evaluation and watching brief of tree replanting pits in the gardens of Rainham Hall. Trenches excavated across an existing large bank and slope exposed differing sequences of deposits from east to west. Trench 1 showed natural deposits dictating the profile of the existing slope, while Trench 2 showed significant bank construction through deposits of made-ground. Deposits relating to an 18th century pond were recorded during the watching brief.
Project dates	Start: 13-07-2010 End: 16-07-2010
Previous/future work	No / No
Any associated project reference codes	RHB10 - Sitecode
Type of project	Field evaluation
Site status	National Trust land
Current Land use	Other 5 - Garden
Monument type	POND Post Medieval
Monument type	BANK Post Medieval
Significant Finds	ANIMAL BONE Post Medieval
Significant Finds	FLINT Late Prehistoric
Significant Finds	POTTERY Medieval
Significant Finds	POTTERY Post Medieval
Methods & techniques	'Targeted Trenches'
Development type	National Trust property regeneration scheme
Prompt	Research
Position in the planning process	Not known / Not recorded

Project location

Country	England
Site location	GREATER LONDON HAVERING RAINHAM The Gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering: An archaeological evaluation and watching brief
Postcode	RM13 9YN
Study area	33.84 Square metres
Site coordinates	TQ 5216 8214 51.5171502781 0.193261040875 51 31 01 N 000 11 35 E Point
Height OD / Depth	Min: 2.59m Max: 4.46m

Project creators

Name of Organisation	Compass Archaeology
Project brief originator	National Trust
Project design originator	Compass Archaeology
Project director/manager	Compass Archaeology
Project supervisor	Gillian King
Type of sponsor/funding body	Local authority
Name of sponsor/funding body	LB of Havering

Project archives

Physical Archive recipient	Museum of London archaeological archive
Physical Contents	'Animal Bones','Ceramics','Glass'
Digital Archive recipient	Museum of London archive
Digital Contents	'none'
Digital Media available	'Images raster / digital photography'
Paper Archive recipient	Museum of London Archive
Paper Contents	'none'
Paper Media available	'Context sheet','Matrices','Notebook - Excavation',' Research',' General Notes','Photograph','Plan','Report','Section','Unpublished Text'

Project bibliography 1

Title	The Gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering: An archaeological evaluation and watching brief
Author(s)/Editor(s)	Cummings, R
Date	2010
Issuer or publisher	Compass Archaeology
Place of issue or publication	5-7 Southwark St
Description	38-page bound report

Entered by	Rosie Cummings (mail@compassarchaeology.co.uk)
Entered on	12 August 2010

Appendix II: London Archaeologist Summary

Site Address:	The Gardens of Rainham Hall, Broadway, Rainham RM13 9YN, London Borough of Havering
Project type:	An archaeological evaluation and watching brief
Dates of Fieldwork:	13th – 16th July 2010
Site Code:	RHB10
Supervisor:	Gillian King
NGR:	TQ 5216 8214
Funding Body:	Regeneration Team of the London Borough of Havering

Evaluation trenches designed to investigate an existing slope and terrace crossing the gardens from east-west exposed underlying sloped natural deposits by which the existing slope was defined in the east. No significant land build up or terracing was observed in this area. However, to the west Trench 2 exposed a complex sequence of deposits suggesting the slope had been artificially constructed through the dumping of made-ground layers, creating a bank similar in profile to that observed in the east. Subsequent alterations in this part of the site included two low revetment walls *c.*19th century and cutting back and terracing at the base of the slope followed by construction of a chain link fence later replaced by an existing concrete block wall. A shallow gravel path was recorded in both trenches at the top of the slope. The archaeological watching brief involved the monitoring of 21 pits excavated during a programme of tree replanting around the site. The majority of the pits exposed a simple sequence of topsoil and subsoil overlying natural deposits of sand and gravel. One pit, excavated in the area of a large pond known to have existed on the site since the early 18th century (and prior to the construction of the Hall and gardens) exposed several deposits thought to relate to the later use, and subsequent backfilling of this feature *c.*1920s.

Appendix III: Pottery Report

Paul Blinkhorn

The pottery assemblage comprised 4 sherds with a total weight of 21g. The fabric codes utilized are those of the Museum of London post-Roman type-series (eg. Vince 1985).

SHER: S. Herts./Limpsfield grey wares, 1140-1300. 1 sherd, 5g.
KING: Kingston-type ware, 1230 – 1400. 1 sherd, 4g.
COLS: Colchester slipped ware,1400-1550. 1 sherd, 3g.
METS: Metropolitan slipware, 1630 – 1700. 1 sherd, 9g.

The pottery occurrence by number and weight of sherds per context by fabric type is shown in Table 1. Each date should be regarded as a *terminus post quem*.

The range of fabric types is typical of sites in London and its environs. The single sherd of METS aside, all the pottery is medieval, and suggests that there was unbroken although somewhat low-level activity at the site from the mid 12th – 15th centuries. The sherd of METS may be contemporary with the construction of the Hall c 1729, although this would be slightly after the assumed end of the production-span of such pottery, as few Harlow potters are documented after the 17th century (Davey and Walker 2009, 9). This therefore suggests possible 17th century activity at the site.

Table 1: Pottery occurrence by number and weight (in g) of sherds per context by fabric type

	SHER		KING		COLS		METS		
Context	No	Wt	No	Wt	No	Wt	No	Wt	Date
8	1	5							M12thC
18 (lower)					1	3			15thC
19			1	4			1	9	E17thC
Total	1	5	1	4	1	3	1	9	

Bibliography

Davey, W and Walker, H, 2009 *The Harlow Pottery Industries* Medieval Pottery Research Group Occasional Paper **3**

Vince, AG, 1985 The Saxon and Medieval Pottery of London: A review *Medieval Archaeology* **29**, 25-93

Appendix IV: Animal Bone Report

RAINHAM HALL, ESSEX, LONDON BOROUGH OF HAVERING (SITE CODE: RHB10): ANIMAL BONE ASSESSMENT

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Quaternary Scientific (QUEST), School of Human and Environmental Sciences, University of Reading, Whiteknights, PO Box 227, Reading, RG6 6AB, UK

INTRODUCTION

This report summarises the findings arising out of the animal bone assessment undertaken by Quaternary Scientific (QUEST), University of Reading in connection with archaeological excavations at Rainham Hall, Essex, London Borough of Havering (site code RHB10). Two evaluation trenches were dug through the west-east bank dividing the Orchard from the rest of the Rainham Hall gardens. Bones were recovered in the westernmost trench, roughly at the centre of the bank, from context (17), close to the upper surface, and context (19) at the base of the constructed bank, approximately at the same height of the lower garden to the south of the bank. It is assumed that both contexts are roughly contemporary with the construction of the Hall in about 1729. All the recovered bones had been drilled at one end (*ca*. 9 -13mm diameter). The aims of the assessment were to identify bone and investigate possible explanations for the presence of the drilled holes.

METHODS

The assessment conforms to the guidance on best practice as described by English Heritage (2002). The animal bone was rapidly scanned and recorded using the following criteria; number of bones, number of fragments, weight of bones in grams, number of bones identifiable to species, fragmentation and preservation, numbers of mandibles, epiphyses and whole bones, species and body parts identified, age and state (including modifications such as butchery, burning, gnawing etc). The results are presented in Table 1.

RESULTS

The assemblages from both contexts are very similar, both entirely composed of cattle metacarpals (Table 1). Each of the bones, where complete, feature a somewhat better level of preservation at the proximal compared to the distal end, the latter generally with a slight to moderate level of weathering/abrasion. It can be assumed from the relatively complete state of the broken bones as well as the lack of relevant butchery, that these bones were complete when originally deposited. The other major similarity is that each bone has been drilled through the medial half of the proximal end. Notably, 3 differently sized drill bits were used (Table 1).

Butchery marks were limited to just one bone, a complete specimen from [17] which had deep knife marks parallel and immediately adjacent to the posterior edge of the proximal end as well as grazing chop marks on the posterior surface of the lateral and medial distal condyles. Measurement of the complete bones offered a range of shoulder heights (extrapolated from the greatest length following the method described in Driesch, von den and Boessneck 1974) between 1142mm and 1299mm with a mean value of 1216.7mm.

Table 1: Distribution and description of the cattle metacarpals, Rainham Hall, Essex, London Borough of Havering (site code: RHB10)

Context	Number	Complete	Drill diameter		
			9mm	11mm	14mm
(17)	5	4	3	1	1
(19)	9	8		1	7

DISCUSSION AND CONCLUSIONS

There are two main questions to be answered, assuming these bones date to the construction/occupation period of Rainham Hall: (1) why are there concentrations of cattle metacarpals in the garden of this house? and (2) what is the purpose of the drilled holes? Fortunately, an answer to the first question is readily available. A watching brief in the gardens of Rainham Hall in 2006 provided a rather similar collection of cattle metacarpals, from garden deposits dated approximately to the 18th century (Rielly 2006). All 24 bones had been drilled through the proximal end, again through the medial half. While a small proportion, in comparison to the more recent collections, clearly formed casual dumps, the majority (18 bones) were described as clustered in a formation lining the northern edge of a path. A similar arrangement was found on the same path, also on the northern side, within another trench preceding the watching brief, but these bones were not kept. The bones in these arrangements were vertically aligned 'joints down'. As a large proportion of these bones had broken distal ends, it was assumed that the proximal end was lowermost. In addition, weathering/abrasion was noticed either on the distal end or the distal end of the shaft, perhaps suggesting why this part of the bone hadn't survived the burial and/or excavation process. Clearly, the distal ends of theses bones had been open to the weather and also to general abrasion. This constructional use could easily apply to the more recent collections. There is a measure of abrasion to the distal ends, perhaps suggesting a similar arrangement, although the better condition of the distal ends may indicate they were placed in a more sheltered part of the garden or that this arrangement was short lived.

The use of cattle metapodials for decorative purposes in the 18th century is not without precedent. Pertinent to this report is the evidence for borders manufactured out of sheep metapodials dating to a somewhat earlier period (Parkinson 1629 taken from Armitage 1989a, 157) and also from a mid 18th century source (Kalm 1892, 67 taken from Armitage 1989b, 220) using cattle and horse metapodials. Both of these mention linings to flower beds rather than paths, and neither mentions whether there was a particular preference for metacarpals rather than metatarsals.

Drilled cattle metacarpals have been found at a number of sites in Southwark, including a few examples from Tabard Square and 156-170 Tanner Street and more substantial collections from 25-47 Lant Street and Bermondsey Square, all dated to the late 17th century (Rielly in prep). The juxtaposition of such items at a late medieval tanning site at Brentford led Yeomans (2006, 145-6) to suggest that this modification was related to the treatment of the hides. The recovery of such items in Bermondsey, within one of the largest concentrations of tanyards in Britain, would tend towards a similar conclusion. It has been established that hides tended to be delivered to medieval and later British tanyards with the foot bones (metacarpals, metatarsals and phalanges) still attached (see Serjeantson 1989). An initial stage in the tanning process involves stretching and scraping the interior part of the skins. The

foot bones, and in particular the metacarpals and metatarsals could have offered convenient anchorage points to stretch the hides, rather than having to pierce the valuable skins. The drilled holes could represent an 'improvement' of this technique, with eye bolts affixed to these foot bones, thus offering a more efficient method of attachment.

It is of interest that the Rainham Hall metacarpals are approximately contemporary with the Southwark examples. Assuming a similar source for this material, it is well known that at least 2 tanyards were present in Rainham in the 16th century (British History Online), although it doesn't say when they ceased to operate. Other tanneries were present in Essex, dating closer to the deposition date of these bones, as for example the tanyard owned by Thomas Waylett at Writtle, just outside Chelmsford. This is known to have been in operation in 1689 (Clarkson 1960, 254).

Finally, the size of the holes found within the bank deposit bones clearly show a rather greater level of variety compared to the other examples mentioned. The Southwark metacarpals were invariably drilled with a drill bit approximately 14mm in diameter, as indeed were those from the earlier Rainham excavations. It is to be wondered if the size of the hole has any bearing on the source of the material or indeed on the manner in which these bones were used.

REFERENCES

Armitage, P.L. (1989a) The use of animal bones as building material in post-medieval Britain. In Serjeantson, D. and Waldron, T. (eds) *Diet and Craft in Towns*. B.A.R. British series 199, Oxford, 147-160.

Armitage, P.L, (1989b) Gazetteer of sites with animal bones used as building material. In Serjeantson, D. and Waldron, T. (eds) *Diet and Craft in Towns*. B.A.R. British series 199, Oxford, 201-223.

Clarkson, L.A. (1960) The Organisation of the English Leather Industry in the Late Sixteenth and Seventeenth Centuries, *Economic History Review*, **13.2,** 245-256.

Driesch, A, von den & Boessneck, J.A. (1974) Kritische Anmerkungen zur Widerristhöhenberechnung aus Längenmaßen vor- und frühgeschichtlicher Tierknochen, *Saugetierkundliche Mitteilungen* **22**, 325-348.

English Heritage (2002) *Environmental Archaeology: A guide to the theory and practice of methods, from sampling and recovery to post-excavation* English Heritage Centre for Archaeology Guidelines 2002/01

Kalm, P. (1892) *Visit to England* (translated from the Swedish by J. Lucas from 1748 edn.).

Parkinson, J. (1629) *Paradisi in Sole Paradisus Terrestris*, London.

Rielly, K, (2006) *The animal bones from watching briefs at Rainham Hall, Essex*. Unpublished in-house report.

Rielly, K, (2010) *Assessment of the animal bones from Bermondsey Square, Southwark (BYQ98)*. Unpublished PCA Report

Rielly, K. (in prep) The Leather Production Industry in Bermondsey: the Archaeological Evidence, in R. S. Thomson (ed.) *The archaeological Evidence for Tanneries*, Archaeological Leather Group.

Serjeantson, D. (1989) Animal remains and the tanning trade. In (D. Serjeantson & T. Waldron, eds) *Diet and Craft in Towns*. B.A.R. British series 199 Oxford, 129-146.

Yeomans, L.M. (2006) *A zooarchaeological and historical study of the animal product based industries operating in London during the post-medieval period*. Unpublished PhD thesis, University College London.

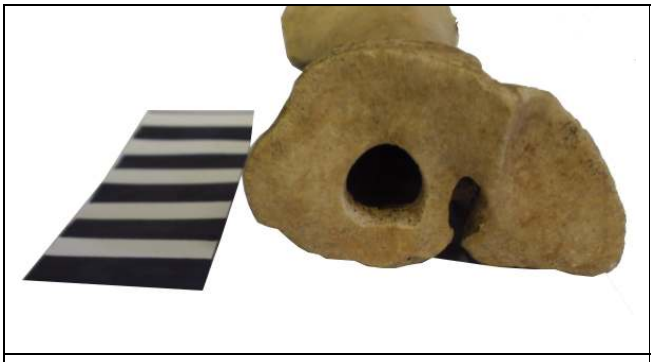

Figure 1: Proximal end of bone with drilled hole

Figure 2: Length of bone

Figure 3: End of bone

Figure 4: End of bone