

Historic Royal Palaces

Lower Car-park and Tennis Court Lane,
Hampton Court Palace, Hampton Court Road, Twickenham,
Surrey.

ARCHAEOLOGICAL EVALUATION REPORT

NGR: TQ 1560 6870

Historic Royal Palaces

Lower Car-park and Tennis Court Lane,
Hampton Court Palace, Hampton Court Road, Twickenham,
Surrey.

ARCHAEOLOGICAL EVALUATION REPORT

NGR: TQ 1560 6870

Prepared by: B M Ford Date: November 2000
Checked by: D Wilkinson Date: 16 / 11 / 2000
Approved by: R. Williams Assistant Director Date: 16 / 11 / 2000

© OXFORD ARCHAEOLOGICAL UNIT

November 2000

Lower Car-park and Tennis Court Lane,
Hampton Court Palace, Hampton Court Road, Twickenham,
Surrey

ARCHAEOLOGICAL EVALUATION REPORT

CONTENTS

Summary	1
1 Introduction.....	1
1.1 Location and scope of work.....	1
1.2 Geology and topography.....	1
1.3 Archaeological and historical background	2
1.4 Acknowledgements.....	2
2 Evaluation Aims and Methodology	2
2.1 Aims.....	2
2.2 Scope of fieldwork.....	3
2.3 Fieldwork methods and recording	3
2.4 Finds	3
2.5 Palaeo-environmental evidence	3
3 Results: General.....	3
3.1 Soils and ground conditions	3
4 Results: Descriptions	3
4.1 Description of deposits	3
4.2 Finds	6
4.3 Palaeo-environmental remains.....	14
5 Discussion And Interpretation	15
5.1 Reliability of field investigation.....	15
5.2 Overall interpretation.....	15
5.3 Summary of anticipated significance of the proposed impacts	17
Appendix 1 Archaeological Context Inventory.....	19
Appendix 2 Pottery Catalogue.....	21
Appendix 3 Clay pipe Catalogue.....	23
Appendix 4 Bibliography and References.....	25
Appendix 5 Summary of Site Details	25

LIST OF FIGURES

- Fig. 1 Site location map.
 Fig. 2 Trench location plan.
 Fig. 3 Set of 5 historic maps.
 Fig. 4 Trench 1, plan and sections.
 Fig. 5 Trench 3, plan and section.

SUMMARY

From the 14th to the 18th of August 2000, the Oxford Archaeological Unit (OAU) carried out an archaeological recording exercise involving the excavation of three test pits at Hampton Court Palace, Hampton Court Road, Twickenham, Greater London. A single test pit (TP3) was located in the Lower Car Park, and a further two (TPs 1 and 2) at the western end of Tennis Court Lane. These works were commissioned by Jonathon Foyle, Assistant Curator of Historic Buildings, Historic Royal Palaces, Hampton Court Palace, Surrey. Test pit 1 revealed a substantial sequence of dump layers, dating to the final years of the 17th century, tipping down from south to north into what is probably the former moat (constructed c.1515-17). Structures relating to the sides of the moat were not located in either test-pit 1 or 2. The infill of the moat was sealed by a cobbled surface, now some 0.3m below the modern tarmac surface of Tennis Court Lane. Test pit 3 revealed the truncated remains of the central wall of the late 17th century Kitchen Gardens, and the heavily demolished remains of a previously unknown structure. This comprised a concrete floor slab with associated brickwork approached by a number of salt-glazed sewage pipes set at regular intervals. At a later point a concrete structure with a central north-south gully was installed. These structures were demolished, and their below ground elements partially truncated, presumably in 1935 when the current car park was installed.

1 INTRODUCTION

1.1 Location and scope of work

- 1.1.1 Between the 14th and the 18th of August 2000 the OAU carried out an archaeological recording action involving a total of three hand excavated test pits which were located in the Lower Car Park and Tennis Court Lane, Hampton Court Palace. This work was commissioned by Jonathon Foyle, Assistant Curator of Historic Buildings, Historic Royal Palaces. It was designed to supply archaeological information to the Curator's Department in advance of the complete replacement of the existing surfacing (including the installation of new services and drainage runs) in the Lower Car Park, and the extension of these new service ducts part-way along Tennis Court Lane. The Assistant Curator established the brief for the scope of the archaeological works.

1.2 Geology and topography

- 1.2.1 The site lies at a height of c.9 m above OD on the First Terrace drift geology of the River Thames, which overlies London Clay. The site is situated on relatively flat low lying ground within a loop of the River Thames on its northern bank.

1.3 Archaeological and historical background

- 1.3.1 The historical background to Hampton Court Palace is well documented, specific written and cartographic information pertinent to these works were supplied by the Assistant Curator and are only briefly summarised here.
- 1.3.2 The area now occupied by the Lower Car Park was initially within the boundary walls of the tiltyard, built in c. 1537-8 at the behest of Henry VIII. The tiltyard fell out of use at the beginning of the seventeenth century. It is unknown what became of the area until the end of the seventeenth century, when it is shown as a walled kitchen garden with internal dividing walls, the central wall and the gardens themselves abutting the north side of the Barrack Block which was built between 1689 and 1700. The central wall of these gardens is shown on Roque's map of 1736 and by 1841 a broad path is shown along the north walls of the Barrack Block. It is thought however that the central wall was demolished during the latter part of the eighteenth century, as there are a number of maps after 1736 but prior to 1841 that do not show it. By 1935, the layout of the current car park had been established.
- 1.3.3 The moat along the west front of Hampton Court Palace was constructed for Thomas Wolsey in c.1515-17. The western stretch immediately before the west front was filled in with rubble generated by demolitions during Sir Christopher Wren's rebuilding programme (1689-1701). The continuation of the moat immediately to the north of the west front in the location of the present Tennis Court Lane seems to have been filled some forty years later, immediately prior to the construction of Carpenters yard in 1739. Tennis Court Lane itself was situated between the palace and the northern orchard and has almost certainly been a thoroughfare for delivery of goods to the palace since Wolsey's tenancy. Up to c. 1739 it was bounded to the west by the line of the moat.

1.4 Acknowledgements

- 1.4.1 Franklins the contractors at Hampton Court Palace who provided attendance to the archaeological works, together with Jonathon Foyle and Adrian Phillips of Historic Royal Palaces deserve thanks for their support.

2 EVALUATION AIMS AND METHODOLOGY

2.1 Aims

- 2.1.1 The work was principally designed to evaluate the location, depth and level of preservation of two structures. Firstly the demolished central wall of the eighteenth century Kitchen Garden, situated on the site of the former Tilt Yard in what is now the Lower Car Park, and secondly the two opposing sides of the Tudor moat whose former alignment runs under Tennis Court Lane.

2.2 Scope of fieldwork

- 2.2.1 The evaluation consisted of three test-pits, whose locations were pre-established by HRP (Fig. 2). Test pits 1 and 2 were located at the western end of Tennis Court Lane, above the projected location of the eastern and western walls of the moat. They measured 1.5m wide by 3.8m long and 1.4m wide by 1.8m long respectively. Test pit 3 was located in the Lower Car Park above the projected line of the central wall of the kitchen gardens, and measured 2.1m wide by 4m long. The attendance contractors removed the tarmac surface, but all other deposits were archaeologically excavated by hand.

2.3 Fieldwork methods and recording

- 2.3.1 The trenches were cleaned by hand and the revealed deposits and features were sampled to determine their extent and nature, and to retrieve finds and environmental samples. All archaeological features and deposits were planned and where excavated their sections drawn at scales of 1:20. All features were photographed using colour slide and black and white print film. Recording followed procedures laid down in the *OAU Fieldwork Manual* (ed. D Wilkinson, 1992).

2.4 Finds

- 2.4.1 Finds were recovered by hand during the course of the excavation and generally bagged by context. Finds of special interest were given a unique small find number.

2.5 Palaeo-environmental evidence

- 2.5.1 Deposits were sampled where they were rich in charred remains, part of a good stratigraphic sequence and contained dating evidence..

3 RESULTS: GENERAL

3.1 Soils and ground conditions

- 3.1.1 The site is located within an existing and heavily used car park, on the north side of the Barrack Block, and at the western end of Tennis Court Lane, on the southern side of the Hampton Court Palace complex (Fig. 2). Ground conditions and the weather were good. No waterlogged deposits were encountered.

4 RESULTS: DESCRIPTIONS

4.1 Description of deposits

Test pit 1 (Fig. 4)

- 4.1.1 A set of twenty-four deposits formed the earliest and main sequence observed in this test-pit. They were recorded to a depth of 7m OD, some 2.30m from the existing road surface, and represented a build-up of deposits 1.8m thick. These deposits tipped

down, primarily from the south to the north, and then from the south-west to the north-east. The initial deposits in the sequence were up to 0.40 m thick, their deposition forming a steep gradient. This gradient shallowed considerably to become horizontal at the top of the sequence, where the deposits were less substantial but more concentrated. The majority of these later deposits were only 0.05m thick. All the deposits were composed of silty sand. The majority of the later deposits, contexts 139, 136, 134, 132, 130, 128, 121, 119, 118 and 126, had a pinkish colour due to the high percentage of fragments and dust from mortar, brick and tile. Other deposits in the sequence, contexts 142, 138, and 113, were of a more greyish hue predominantly from charcoal and ash inclusions. This sequence filled a large negative feature whose sides and base were not located within the limits of the excavation, therefore it is not clear at which point the fills stop filling the negative feature and are acting as ground levelling deposits.

- 4.1.2 Sealing this extensive sequence was a final layer of heavily compacted crushed building materials overlain by a thin sand layer into which was set deposit 112, the remains of a cobbled surface.
- 4.1.3 Above 112 was a further sequence of deposits, 109, 110, and 108, which consisted of mainly crushed building materials, and were cut by trenches for storm water drainage pipes and another partially revealed negative feature, cut 103, of unknown function. These were sealed by a tarmac road surface that was cut by another possible service trench before the final tarmac resurfacing.

Test pit 2

- 4.1.4 This test-pit was halved in size when live cables were detected running across its eastern side. It was finally abandoned when the removal of the existing tarmac road surface on the remaining half revealed a multitude of service trenches filling the entire area within the trench limits. The backfills to the service trenches were excavated to expose the pipes and cables, the lowest of which was recorded at 8.62m OD, some 0.75m below existing ground level. The backfills to these service trenches, context 201, yielded a large number of architectural stone fragments.

Test pit 3 (Fig. 5)

- 4.1.5 Natural brickearth 313 was encountered at a depth of 8.50m OD; this was overlain by a geological gravel deposit 314 which measured 0.30m thick, thus the uppermost level of natural deposits was recorded at 8.80m OD.
- 4.1.6 The natural deposits were truncated by a north/south running construction cut 316. The cut was vertically sided with a flat base and measured 1.10m wide by 0.60m deep. The primary fill of this linear feature, 322, was a 0.50m deep deposit of building rubble. This material consisted of: randomly and loosely dumped broken sections of bonded brick, dressed chalk with impressions of coursed brickwork in the adhering mortar, broken flint nodules and stone pieces within a matrix of mid-brown sandy-silt. The orange-red bricks measured 0.23m long by 0.10m wide by 0.053m

thick, and were bonded by a hard creamy white lime based mortar. This foundation supported a brick faced structure with a rubble core, 317. This structure stood proud of construction trench 316 to a height of three brick courses. It measured 0.90m wide by 0.45m high. The facing bricks were purplish red in colour and measured 0.23m long by 0.105m wide by 0.06m thick. The bond of the brickwork could not be established from the limited remains, but it had a random appearance and used more half bricks than whole bricks. The rubble core comprised broken bricks, chalk lumps and flint nodules. The faces and core of the structure were bonded with the same friable mid-brown lime based mortar, which contained a high percentage of sand and occasional chalk flecks. The construction trench was back-filled and the ground level either side of structure 317 was then raised with redeposited natural gravel 320, and brickearth 315.

- 4.1.7 The above structure was cut to the south by 308, and to the west by 312. Cut 308 represents part of the construction cut for the installation of a flat topped concrete foundation, 318, upon which sat the traces of brickwork possibly forming a small bay. The extent of this structure was hard to define, and only its northern limit was observed in the test pit. To the west the structure had been grubbed out during its subsequent demolition, (cut 306). This same demolition cut ran east/west through the whole length of the test pit and probably defines the orientation of structure 318 if not its full extent. Cut 312 was a wide service trench in the north-west corner of the test pit. It contained the remains of four separate four inch diameter salt glazed ceramic pipes. These were probably sewage pipes and fanned out from the north to the south. Their gradient suggests that they were draining sewage from a building to the south, possibly structure 318, with an outflow located beyond the northern limits of the test pit.
- 4.1.8 Structure 318 was partly truncated by the construction of structure 319. This structure was represented by a dark grey granular concrete strip that had been poured into a 0.50m wide north-south running trench. Formed in the top of this concrete was a slot, measuring 0.08m wide, at least 0.10m deep and running for 1.50m in length from the southern extent of the test pit. At the northern end of the slot part of a probable timber post was recorded. The structure is probably some form of addition to structure 318.
- 4.1.9 A major east/west aligned cut, 306, appears to represent the demolition and partial 'grubbing out' of structure 318 and its addition 319. In addition it severed the physical and stratigraphic relationships between structures 318/319 and the ceramic pipes in cut 312. Inside one of the ceramic pipes and probably dating from the demolition activity was an old milk bottle from the *Express Dairy Co. Ltd.* The resulting hole was backfilled with demolition material and levelled.
- 4.1.10 The levelled area was overlain with a gravel layer that acts as the make-up for the existing tarmac car park surface of the Lower Car Park.

4.2 Finds

Pottery by Duncan H Brown

Introduction

- 4.2.1 Seventy-four sherds of pottery were recovered from ten contexts and sorted by context, ware type, vessel type, sherd type and rim diameter, then quantified by rim percent, weight in grams and sherd count. Aspects of decoration and abrasion were recorded in a 'comments' field. The data was entered into a spreadsheet using Microsoft Excel (Appendix 2). There follows a brief discussion of the assemblage.

Discussion

- 4.2.2 The assemblage is too small for analysis to provide any telling insight into pottery use at Hampton Court, and reveals little about the in filling of the moat. The generally small size of the sherds, together with the cross-fitting vessel (cross-fit number one) that links contexts 138 and 139, suggests that the fills were derived from an early dump deposit and that this material represents secondary deposition.
- 4.2.3 Seven contexts, 113, 131, 135, 138, 140, 141 and 142, may be dated to the late 17th or early 18th centuries on the basis of the pottery. The relatively high quantities of English tin-glazed ware, and the absence of stoneware, both suggest a 17th century date. Later dates are indicated for contexts 101, 123 and 139 by finds of Creamware, transfer print and refined earthenware. These may be intrusive, or at least indicative of later disturbance.
- 4.2.4 There is a comparatively high quantity of English tin-glazed ware and this is worthy, perhaps, of further comment. If this material pre-dates the regular use of Oriental porcelain, then these fragments might accord with the high status of the site. Even after porcelain superseded tin-glazed wares, however, production continued and was generally supplied to households that could not afford Oriental ceramics. At Hampton Court, therefore, these tin-glazed pots could represent either high-class pottery or later run-of-the-mill material used, perhaps, by servants. The other ware types present are earthenwares in common currency in London. At Hampton Court these too would most likely have been for the use of domestic staff.

Glass by Ben M Ford

- 4.2.5 The assemblage comprised a total of 53 fragments of glass of which ten are of plain window glass. The remainder includes a variety of unidentifiable vessels and bottles. The following table shows their provenance and date/date range.

Quantification of the glass assemblage.

Test pit	CTX	NOS	Ident	Date
1	101	3	Bottle	C19th
1	113	5	Window	C17-18th
1	113	11	Bottle	C17-18th
1	113	2	?Vessel	C17-18th
1	123	3	Window	C17-19th
1	123	1	?Vessel	C17-19th
1	132	1	Bottle	C17-18th
1	135	4	Bottle	C17-18th
1	138	11	Bottle	C17-18th
1	138	5	Vessel	C17-18th
1	138	1	Window	C17-18th
1	139	2	Bottle	C17-18th
1	139	2	Vessel	C17-18th
1	140	1	Window	C17-18th
1	140	1	?Vessel	C17-18th
Total		53		

Window Glass

4.2.6 All ten fragments of window glass were examples of plain glazing probably dating to the 17-18th centuries. They were all retrieved from test pit 1.

Vessel Glass (incl. Bottles)

4.2.7 All the vessel glass is of a post-medieval date ranging from the 17th century to the 18th century. They were all retrieved from test pit one.

Clay pipe by David Higgins

The Pipes

4.2.8 The excavation of Test Pit 1 recovered a total of 54 fragments of pipe, comprising 6 bowl and 48 stem fragments. No mouthpiece fragments were recovered. The pipe fragments have been individually examined and details of each fragment logged on an Excel worksheet. The layout of the worksheet has been based on the draft clay tobacco pipe recording system that has been developed at the University of Liverpool (Higgins & Davey, 1994). Copies of both the worksheet and the draft recording system have been provided for the site archive. Bowl forms have been recorded with reference to the London typology established by Atkinson and Oswald (1969). An assessment of the likely date of the stem fragments has also been provided. The stem dates should, however, be used with caution since they are much more general and less reliable than the dates that can be determined from bowl fragments. All of the pipes were recorded and dated before the context matrix and supporting data were examined. This methodology avoids any pre-conceptions being formed as to the possible date or nature of the various pipe groups while they are being identified and catalogued.

4.2.9 A context summary has been prepared which gives the overall date range for the pipe fragments from each context (Table 1). From this, it is evident that the majority of the

pipes recovered date from the eighteenth century with very little earlier or later material present. One stem fragment with moulded leaf decoration towards the bowl junction and along the seams was recovered from Context 101. This style of decoration was popular around 1810-50, which is in keeping with the post moat build-up with which this context was associated.

- 4.2.10 The only other post-moat deposits from which pipes were recovered were 104, which produced a single stem dating from the seventeenth century or first half of the eighteenth century, and 123, which produced five stems with a date range of about 1680-1820. The earliest stem was very battered and appeared to be residual with the majority of the fragments suggesting a later eighteenth century date for this deposit.
- 4.2.11 The remaining pipes, from contexts 113 and 131-142, were all associated with the moat fills. These deposits contained one or two residual seventeenth century stems but the majority of the material was consistently of eighteenth century date with no nineteenth century or later pipes present. Several of these contexts (113, 138, 139, 140, 141 and 142) produced stem fragments in excess of 50mm in length suggesting that the moat deposits were made up of relatively fresh material. The uniform style and substantially complete nature of the bowl fragments that were recovered from these deposits support this suggestion.

Table 1: Context Summary *This table shows the number of bowl (B) and stem (S) fragments from each context (Cxt), together with their overall date range (Date). It also shows the number of burnt fragments (b) in each context.*

Cxt	B	S	Date	b	Comments
101		3	1680-1850		1 early C19th stem with moulded leaf decoration (c1810-50). Another stem probably 1780-1820.
104		1	1610-1750	1	
113	4	7	1700-1800		Three bowl frags and one stem join together. The two bowls both of 1700-70 type – one marked RC and one marked RT. Probably both Kingston products.
123		5	1680-1820		Generally thin stems – probably a later C18th context.
131		6	1610-1770	1	All 1700-1770 types with 1 residual fragment.
132		4	1640-1770	2	Three of the four are 1700-1770 types.
134		3	1700-1800	3	
135		1	1700-1770	1	
136		1	1610-1770		Most likely an C18th fragment, around 1700-1770.
138		5	1680-1770		Four of the five are 1700-1770 types.
139	1	5	1700-1770	1	Consistent group with the bowl marked RT. Probably a 1710-50 period maker at Kingston. One piece of stem curved.
140	1	4	1660-1770		Bowl marked RT (see above) . Likely to be a 1700-1750 group.
141		2	1680-1770		
142		1	1680-1770		
Tot	6	48		9	

- 4.2.12 A total of six bowl fragments were recovered from the moat deposits. Three of the pieces from Context 113 joined to form a single bowl, which also joined a long stem fragment (120mm) from the same context. This supports the assertion that the material in 113 represents a very fresh and undisturbed deposit. The re-assembled

bowl and the other three examples (Contexts 113, 139 and 140) are all of the same basic form, i.e., London Type 25 (Atkinson & Oswald, 1969, Fig 2). The Type 25 bowl was particularly popular and long-lived in the London area, being the standard form produced in the region from c1700-1770. All four of the Hampton Court examples have the maker's initials moulded on the sides of the heel and these can be used to refine the dating of the moat fill.

- 4.2.13 One of the bowls, from Context 113, is marked RC. Other examples of eighteenth century pipes marked RC have been found at Croydon (2 examples), Ewell (several examples), Weybridge (1 example) and Kingston (16 examples; Higgins 1981, 226-38). Eighteenth century pipes marked RC have not been recovered from elsewhere in Surrey, which makes this concentration of finds, all from within 10 miles of Kingston, all the more striking. The Kingston pipe-making industry has not been studied in any detail and so this maker, who seems almost certain to have worked there, cannot at present be identified. One possible candidate is the Robert Collis, pipemaker, who baptised his son Robert at Shalford, near Guildford, on 11 March 1711/12. No later references or pipes attributable to this maker are known from around Guildford and so it is possible that he moved to work at Kingston.
- 4.2.14 The other three marked bowls, all with the relief-moulded initials RT on the sides of the heel, were recovered from Contexts 113, 139 and 140. These are equally problematic to identify but they are especially significant since they occur in contexts ranging from the top almost to the very bottom of the moat fill. The example from the lowest context, 140, has a quite chunky, 'heavy' feel to it, with thick stem and bowl walls. These features suggest that it is an early form, probably dating from the first 30 or 40 years of the eighteenth century. In all of these examples the 'kicking' leg of the initial R is rather weakly formed. All three pipes were produced in different moulds, indicating that this appears to have been a regular characteristic of the RT pipes. The R of the RC pipe from Hampton Court is similarly formed, as are the illustrated examples of RC pipes from Kingston (Higgins 1981, Figures 44.7-9). This suggests that the moulds for both makers may have been produced in a common workshop.
- 4.2.15 In a study of Surrey pipes, five examples of eighteenth century bowls marked RT were recorded, all from the north of the county. There were single examples from Nonsuch Palace, Epsom and Ewell and two examples from Kingston (Higgins 1981, 226-238). The RT pipe from Epsom was recovered from a good sealed pit group, the pipes from which have been closely dated to c1714-20 (Higgins 1987, 416). This supports the earlier eighteenth century date suggested by the example from Context 140. At least one and probably two other RT pipes have previously been recovered from excavations at Hampton Court. On the basis of the distribution and dating evidence given above, these have been attributed to an as yet unidentified Kingston maker, working c1710-50 (Higgins 1998, 151). The three RT pipes from the latest excavations strengthen the distribution pattern of these pipes in the Kingston area.

- 4.2.16 With regard to the manufacturing and finishing of the pipes, there are four points to note. The first is that one of the RT pipes (Context 139) has an internal bowl cross inside the bowl. These marks were formed by cuts on the metal stopper, which was used to form the bowl during the manufacturing process. The second is that all the RT pipes were produced in different moulds. This suggests that the RT maker operated a well-established and prolific workshop employing a number of journeymen. The third is that a curved stem fragment was recovered from Context 139. Curved pipes are not generally found until the end of the eighteenth century suggesting that this is either a particularly early example or that it is a poor quality product with a badly warped stem. The fourth point is that one of the stem fragments from Context 138 has a very glossy surface, which appears to have resulted from the application of good quality burnishing. Burnishing the surface of the pipe was an additional job, which consequently resulted in a higher cost for the finished article. London area pipes were very rarely burnished during the eighteenth century and this example is interesting since it may represent the use of a more expensive class of pipe at Hampton Court Palace.
- 4.2.17 The final point to note is the unusually high incidence of burnt pipe fragments in this assemblage. Single burnt fragments were recovered from Contexts 104, 131, 135 and 139, with two examples in 132 and three in 134. These 9 examples constitute 17% of the assemblage as a whole or 42% of the pipes from these six contexts. Apart from the single stem in 104 all of these contexts formed part of the moat fill. The high percentage of burnt fragments from this area may suggest that the pipes were coming from a specific source, such as hearth debris or from a burnt building.
- 4.2.18 Although the evaluation only produced a small sample of pipes they have proved to be of interest for a number of reasons. The sequence from the moat fill suggests that this material was all freshly deposited around 1710-1750 while the presence of burnished and, possibly, of curved pipes hints at the consumption of a few more expensive products at the site. The majority of the pipes, however, are of standard London styles and suggest that the bulk of pipes used at the Palace were not out of the ordinary. The four marked bowls all fall within a striking distribution pattern centred on Kingston, where the RC and RT makers are likely to have worked. This in turn suggests that supplies for the Palace, at least in terms of the pipes, were obtained locally from traders in Kingston. The broader distribution of RC and RT pipes shows that the Kingston pipemakers were supplying a market with a radius of about 10 miles from their production centre.

Animal bone by Bethan Charles

Introduction and Quantification

- 4.2.19 A total of 70 fragments of bone (1165g) were recovered by hand from excavations by the OAU at Hampton Court Palace. Some of the bone was re-assembled, reducing the fragment count to 57. In addition to the hand collected bone some bone was

recovered from environmental samples. This material was looked at briefly. All of the bone was from post medieval deposits from within the moat.

Methodology

- 4.2.20 The assemblage was recorded through the use of a simple recording sheet. This enabled a quick calculation of totals to be made along with a rough estimation of the number of individuals in each context and in total. All fragments of bone were counted including elements from the vertebral centrum, ribs and long bone shafts.
- 4.2.21 The sheep and goat bones were separated using the criteria of Boessneck (1969), Prummel and Frisch (1986), in addition to the use of the reference material housed at the OAU.
- 4.2.22 Ageing by measuring the rate of epiphyseal fusion of the bones was done using Silver's (1969) tables. However, the data has not been included in the assessment due to the small number of indicative elements recovered from the excavation.

Condition

- 4.2.23 The majority of the bone was in good condition with only a small amount of attritional damage. Eight of the bones from the site had clear butchery marks including the remains of a large bone that has not as yet been identified to species.

Results

- 4.2.24 It can be seen from table 1 that cattle and sheep appear to have provided the majority of the meat to the inhabitants of the site. A small number of pig bones were also recovered along with one goat metatarsal. In addition to the domestic species it also appears that the inhabitants were eating wild species.
- 4.2.25 A Fallow deer metapodial and a rabbit femur indicate some variety in the diet of the inhabitants during the post medieval period of occupation.

Context	Cattle	Sheep	Goat	Pig	Fallow Deer	Rabbit	Unidentified	Total	Period
113	5	4	0	2	0	0	10	21	17/18th century
131	0	1	0	0	0	0	0	1	17/18th century
135	0	1	0	0	0	0	1	2	17/18th century
138	2	3	0	4	0	1	8	18	17/18th century
142	0	1	0	0	0	0	1	2	17/18th century
139	1	2	0	0	0	0	0	3	18th century
123	2	1	0	0	0	0	1	4	18/19th century
101	0	0	1	0	0	0	2	3	19th century

Context	Cattle	Sheep	Goat	Pig	Fallow Deer	Rabbit	Unidentified	Total	Period
121	1	1	0	0	1	0	0	3	Unphased
Total	11	14	1	6	1	1	23	57	

- 4.2.26 Three samples were taken from the site for environmental processing. From these samples bone was recovered from meshes of between >10mm, 10 - 4mm and 4 - 2m. Fragments of bone included elements from the main domestic species as well as bone from small mammals and fish bone. It would be of value to have the fish bone identified to species.
- 4.2.27 It is clear from the richness of the faunal assemblage recovered from the environmental samples that any larger scale excavations at the site would benefit greatly from further sampling in order to recover more evidence of the variety in the diet of the inhabitants.
- 4.2.28 It is likely that the animal bones recovered from the site represent domestic waste. The small number of bones recovered from the site does not provide much information regarding the economy of the site other than the presence of the animals. However, evidence of bird, deer, rabbit and fish bone indicate that the diet was varied, as might be expected at such a high status site.
- 4.2.29 The remains of a large long bone fragment with butchery marks was recovered from context 138. The bone has not been identified to species.

Metal objects by Leigh Allen

Introduction and description

- 4.2.30 A small and very corroded assemblage of 12 iron objects was recovered from the archaeological investigations at Hampton Court Lower Car Park and Tennis Court Lane. Eleven of the objects are nails or possible nail shanks from 17th-19th century contexts; they all require x-radiography in order to facilitate full identification. All the nails have rectangular cross-section shanks but corrosion products obscure the heads. The remaining iron object is an angled strip with a rectangular cross section, it is also heavily corroded especially at the right angle and x-radiography may reveal further details. Two fragments of lead were also recovered from the investigations: one is a fragment of folded sheet while the other is an irregularly shaped off cut with a ragged edge.

Test Pit/ Context	Object	Material	Preservation	Description	Dimensions	Date
1/101	Nails (x3)	iron	complete	All three nails have rectangular cross section shanks and corroded heads.	L: 70mm, 78mm and 138mm.	(19th century).
	Sheet	lead	incomplete	A fragment of folded lead sheet.	L: 65mm.	(19th century)
1/113	Nails (x3)	iron	complete.	All three nails have rectangular cross	L: 54mm, 56mm and	(17-18th century).

Test Pit/ Context	Object	Material	Preservation	Description	Dimensions	Date
				section shanks and corroded heads.	70mm.	
1/121	Object	iron	incomplete	An angled strip with a rectangular cross section, the strip is heavily corroded.	L:97mm.	? century
	Off-cut	lead	incomplete	An irregular shaped fragment of lead sheet with a ragged edge where it has been roughly cut or torn.	L:57mm	? century
1/123	Nail	iron	complete.	A nail with a rectangular section shank and a corroded head.	L:88mm.	(18th-19th century).
1/136	Nails (x2)	iron	complete	Both nails have rectangular cross section shanks and corroded heads.	L: 61mm and 70mm.	? century
1/138	Strip	iron	incomplete	Possible nail shank.	L: 41mm.	(17th-18th century).
	Nail	iron	complete	A very corroded nail.	L: 54mm.	(17th-18th century).

Conclusion

4.2.31 The assemblage contains no diagnostic objects: the ironwork should undergo x-radiography for record purposes and to complete the identifications. Beyond that no further work will be necessary.

Worked stone by Ben M Ford and Julian Munby

A total sample of 8 fragments of architectural stone were retrieved from the archaeological recording actions in the Lower Car Park and Tennis Court lane, Hampton Court Palace. These are listed in the table below.

Test-pit/ Cxt	Stone Sample	Object	Material	Dimensions	Comment	Date
1/121	4	slab	v. fine limestone		Incomplete	Post-med?
1/121	5	mullion	rough limestone		Incomplete	Post-med C17?
1/121	6	roll moulding /free column	rough limestone	0.11m dia.	Incomplete	Medieval
1/121	7	slab/cornice?	rough limestone		Incomplete	Post-med?
1/121	8	roll moulding	rough limestone	0.11m dia.	Incomplete	Medieval
2/201	1	door/window jamb	fine limestone		Near complete. Lead+iron jointing	Post-med
2/201	2	door/window jamb	fine limestone		Incomplete. Lead jointing	Post-med
2/201	3	moulding	rough limestone		Incomplete off cut	Post-med

Conclusion

4.2.32 The assemblage of architectural stone from this archaeological evaluation represents a moderately interesting collection of dumped stone from demolition /rebuilding works at Hampton Court Palace.

- 4.2.33 The jambs (worked stone numbers 1 and 2), could date to the period of Wolsey but no earlier. The embedded metal ties suggest they were located in an exposed place, and could even belong to part of a battlement or parapet rather than a simple door or window. However these may simply indicate that they are post-medieval in date.
- 4.2.34 Of note are the two fragments of medieval mouldings (worked stone numbers 6 and 8 from context 121 in test-pit 1). These ought to be pre-Wolsey and possibly belong to the thirteenth century buildings used by the Knights Hospitallers of St John of Jerusalem, or the fifteenth century buildings associated with the Abbots of the Order of St John. If so it suggests that Wren's demolition and rebuilding programme in the late seventeenth century, could have included the demolition of some still extant medieval structures.

Ceramic Building Materials by Nick Mitchell and Ben M Ford

- 4.2.35 A total 31 fragments, weighing 2180g, of ceramic building material were assessed from the HCP 29 excavations. All the material was retrieved from test pit 1. The assemblage comprised 26 fragments of flat tile, 2 fragments of pantile, a single fragment of glazed floor tile, and 3 brick fragments.
- 4.2.36 All the flat (peg) tiles and the pan-tiles probably represent roofing tiles: these are likely to derive from a demolished building.
- 4.2.37 The flat (peg) tiles are undiagnostic and could as easily be medieval or post-medieval in date. The floor tile is tentatively dated to the late medieval period.

Test pit/Context	Object	Number	Weight (g)	Dimensions (T= thickness)	Comment	Context Date
1/102	pantile	1	77	T 0.012m	fragment, curved over edge	C19-20
	flat tile	1	31	T 0.012m	fragment	
1/104	flat tile	1	44	T 0.012m	fragment	C19-20
1/113	flat tile	18	970	T 0.014m-0.012m	fragments, mortar adhering to 8 fragments	C17-18
	brick	3	103	no dimensions	fragment	
1/121	pantile	1	148	T 0.012m	fragment	C18-20
	flat tile	1	42	T 0.012m	fragment	
1/131	?floor tile	1	192	T 0.034m	fragment, worn greeny-brown glaze with no pattern on one side	C17-18
1/133	flat tile	1	81	T 0.012m	fragment with circular peg hole, mortar adhering	C17-18
1/135	flat tile	1	118	T 0.012m	fragment, mortar adhering	C17-18
1/136	flat tile	1	214	T 0.012m	fragment	C17-18
1/140	curved tile	1	160	T 0.02m	fragment, chamfered edge	C17-18
TOTAL		31	2180			

4.3 Palaeo-environmental remains

Charred plant remains by Dana Challinor

- 4.3.1 During the evaluation, three soil samples were taken for the recovery of charred plant remains (contexts 113, 138, 142). All three samples were from deposits in the moat (dated to the early eighteenth century) and were 10 to 25 litres in size. The samples were processed by flotation using a modified Siraf-type machine and the resultant flots were dried and scanned under a binocular microscope at x10 to x20 magnification. The flots were large in size, so only a portion (c. 20%) of each flot was assessed.
- 4.3.2 All of the flots were dominated by coal, with large quantities of clinker fragments. Small amounts of wood charcoal were also visible and were abundant in one sample (context 113). Mixed taxa were present, but *Quercus* sp. (oak) was the most common. Most of the charcoal fragments were from roundwood. No other plant remains were identified; although charred amorphous material was noted, this was not identifiable. Other material present in the flots included fish bones and scales (contexts 113, 142).
- 4.3.3 The remains recovered from the moat deposits are likely to represent the dumped residue of fuel debris. These samples are of limited value and sampling for charred plant remains is considered of low potential in any further excavations.

5 DISCUSSION AND INTERPRETATION

5.1 Reliability of field investigation

- 5.1.1 Test pit 1 provides a well-stratified sequence from a very limited intervention. It yielded fair, but limited, dating and environmental evidence from secure contexts. The provenance of some of the finds from the sequence in test pit 1 could have been effected by the depth and restrictive nature of the excavated shaft, i.e. finds from later contexts may have been dislodged and fallen into earlier deposits whilst physically accessing the deeper excavations.
- 5.1.2 Test pit 2 was located in the centre of Tennis Court Lane. It was cut about by a concentration of service ducts, and had to be abandoned. It is not thought that the service trenches will have significantly effected the moat fills or any associated retaining walls of the moat. However any former surfaces to Tennis Court Lane post dating the moat infill will be severely truncated.
- 5.1.3 In test pit 3 the limited nature of the excavation did not yield any dating evidence, other than building materials.

5.2 Overall interpretation

Summary of results of Tennis Court Lane

- 5.2.1 It is currently assumed, (see 1.3.3 this report), that the area of the moat immediately in front of the West Front was infilled rapidly in 1689, using rubble from Wren's demolition of the Tudor royal apartments. It was not until some 40 years later that the area immediately to the north and adjacent to the West Front was infilled prior to the construction of Carpenters Yard in 1739.
- 5.2.2 Based upon a combination of an examination of the cartographic evidence for Hampton Court Palace from the post-medieval period (Fig. 3), and the archaeological evidence from Test-pit 1 (Fig.4), it is possible to suggest a more detailed history for the moat at the point that it is crossed by Tennis Court Lane.
- 5.2.3 The cartographic evidence shows an interruption in the continuation of the moat immediately to the north of the west front in the location of the present Tennis Court Lane. This interruption takes the form of a gap indicated primarily on PRO WKS 34/112 dated 1690-91 (Fig. 3). This apparent gap is also indicated on later maps including Talman's map of c.1698; Bridgeman's map of c.1710; and in more detail on Rocque's map of 1736 (Fig 3). It is not clear from the pre Rocque maps, as to whether the gap is some form of bridging structure, rather than an infilling of the moat *per se*.
- 5.2.4 Excavations in test pit 1 found a series of dumps filling a large negative feature, the edges and base of which were not located within the limits of the excavation. When the test pit locations are applied to the historic maps (Fig. 3) it is clear that test pit 1 is located well within the limits of the moat. It can therefore be suggested that these deposits relate to the infilling of the moat and that the western edge of the moat, possibly represented by a brick retaining wall, lies further to the west of test pit 1. The pottery evidence from these moat backfills suggest these contexts can be firmly dated to the late 17th- early 18th century. This date-range can be tentatively refined by the dates from the small assemblage of clay pipe fragments. The clay pipe forms from the moat backfills are considered to have been introduced in the first decade of the 18th century, but it is possible that they were in circulation as early as the mid-late 1690s (D Higgins *pers comm*).
- 5.2.5 It is therefore probable that the specific part of the moat at the location of test pit 1 was backfilled at some time not before the mid-late 1690s. The nature of the backfills suggest that not only did these deposits derive from demolition activity, but that these were interspersed with everyday domestic waste, such as the ashes from hearths, broken glass, pottery and animal bones.
- 5.2.6 It remains possible, though unlikely, that the moat was filled with material obtained from other areas of dumping, possibly not from within the Hampton Court Palace complex itself, and that the deposits excavated are therefore secondary deposits.

Summary of results of Lower Car park

- 5.2.7 The truncated foundation and footings of a substantial wall was recorded in test pit 3. This can be interpreted as the remains of the central wall to the Kitchen Gardens. The

Kitchen Gardens and therefore this wall were probably constructed at the same time as the Barrack Block, i.e. by c.1690-91 (Fig 3. WKS 34/112 c.1690-90). It would appear that the wall was still standing by 1897 (Fig. 3; O.S. 1897).

- 5.2.8 Demolition of this wall in the location of test pit 1 occurred at some point after 1897, to allow construction of a concrete and brick structure, which was probably drained by a series of sewage pipes. There is no cartographic evidence at all for this structure in this location. However it can be suggested that the structure may have been some form of toilet block, possibly added to the Cavalry Barracks (now demolished) that occupied the eastern side of the Lower Car Park at the end of the 19th Century.
- 5.2.9 It is not clear whether part or all of the above structure was demolished/alterd when structure 819 was built. Structure 819 could be interpreted as the guiding slot with an end-post for some form of superstructure housing a sliding gate. This interpretation combined with its alignment would suggest a possible reinstatement of the division of this area of land first marked by the central wall of the kitchen Garden. There is no cartographic evidence for this structure.
- 5.2.10 Complete demolition of 318 and 319 was evidenced by a large cut which 'grubbed out' much of their foundations. It is unclear as to whether this occurred before, during or after the construction of the Lower Car Park in 1935. However it must have taken place by 1972, as the structures are not present on the Ordnance Survey of that date (Fig. 2).

5.3 Summary of anticipated significance of the proposed impacts

- 5.3.1 The Lower Car Park is to be partially lowered by c.0.25m and completely rebuilt. This will initially involve a reduction of the existing ground level by at least 0.60m to allow the correct graded materials to form the foundations for the new surface. This depth of ground reduction will remove all but the foundations of the Kitchen Garden wall, and the later brick and concrete structure found in test pit 3.
- 5.3.2 The new car park requires new drainage runs; these will be excavated to at least 2m below existing ground level, thereby removing all archaeological deposits within their footprint.
- 5.3.3 Other service ducts are to be lain through the Lower Car Park and into Tennis Court Lane. Here they will connect with existing ducts adjacent to the Guards House. The depth of these ducts will be c.0.8m below the current level of Tennis Court Lane and the new car park surface. At this depth all the recorded archaeology in test pit 3 will be truncated. However, the new duct will only truncate former surfaces to Tennis Court Lane which post-date the in-filling of the moat; it will not significantly effect the moat fills, and therefore should not effect any associated retaining walls.

APPENDICES

APPENDIX 1 ARCHAEOLOGICAL CONTEXT INVENTORY

Trench	Context No.	Type	Description	Finds AB-Animal Bone/MO- Metal Object/CP- Clay Pipe/P- Pottery/G-glass	Date Ranges:CP/(POT)	Context date	Soil Sample No (SS)/ Worked Stone No
1	100	Deposit	Tarmac surface				
1	101	Deposit	Make-up for 100	AB:MO:CP:P: G	1680-1850/(1600-1900)	19C	
1	102	Deposit	Fill of 103				
1	103	Cut	Pit (part excavated)				
1	104	Deposit	Make-up layer	CP	1610-1750		
1	105	Deposit	Backfill of 106				
1	106	Cut	Service trench (drains)				
1	107	Deposit	Pipe filling 106				
1	108	Deposit	Make-up				
1	109	Deposit	Make-up				
1	110	Deposit	Make-up				
1	111	Deposit	Make-up				
1	112	Structure	Cobbled Surface				
1	113	Deposit	Probable moat backfill	AB:MO:CP:P: G	1700-1800/(1550-1900)	17-18C	SS1
1	114	Deposit	Make-up				
1	115	Deposit	Make-up				
1	116	Deposit	Make-up				
1	117	Deposit	Make-up				
1	118	Deposit	Make-up				
1	119	Deposit	Make-up				
1	120	Deposit	Make-up				
1	121	Deposit	Make-up	AB:MO			WS 4,5,6,7,8
1	122	Deposit	Make-up				
1	123	Deposit	Make-up	AB:MO:CP:P: G	1680-1820/(1600-1900)	18-19C	
1	124	Deposit	Backfill of 125				
1	125	Cut	Service trench (drains)				
1	126	Deposit	Make-up				
1	127	Deposit	Make-up				
1	128	Deposit	Make-up				
1	129	Deposit	Make-up				
1	130	Deposit	Probable moat backfill				
1	131	Deposit	Probable moat backfill	AB:CP:P	1610-1770/(1580-1900)	17-18C	
1	132	Deposit	Probable moat backfill	CP:G	1640-1770		
1	133	Deposit	Probable moat backfill				
1	134	Deposit	Probable moat backfill	CP	1700-1800		
1	135	Deposit	Probable moat backfill	AB:CP:P:G	1700-1770/(1600-1800)	17-18C	
1	136	Deposit	Probable moat backfill	MO:CP	1610-1770		
1	137	Cut	Possible cut				
1	138	Deposit	Probable moat backfill	AB:MO:CP:P: G	1680-1770/(1600-1800)	17-18C	SS 2
1	139	Deposit	Probable moat backfill	AB:CP:P:G	1700-1770/(1600-1900)	18C	

Trench	Context No.	Type	Description	Finds AB-Animal Bone/MO- Metal Object/CP- Clay Pipe/P- Pottery/G-glass	Date Ranges:CP/(POT)	Context date	Soil Sample No (SS)/ Worked Stone No
1	140	Deposit	Probable moat backfill	CP:P:G	1660-1770/(1550-1900)	17-18C	
1	141	Deposit	Probable moat backfill	CP:P	1680-1770/(1580-1900)	17-18C	
1	142	Deposit	Probable moat backfill	AB:CP:P	1680-1771/(1580-1900)	17-18C	SS 3
2	200	Deposit	Tarmac surface				
2	201	Group	Multiple service trenches				WS 1,2,3
3	300	Deposit	Tarmac surface				
3	301	Deposit	Make-up for 300				
3	302	Deposit	Backfill of 306				
3	303	Deposit	Backfill of 307				
3	304	Deposit	Backfill of 308				
3	305	Deposit	Backfill of 309				
3	306	Cut	Demolition Cut				
3	307	Deposit	Backfill make-up of 308				
3	308	Cut	Construction cut				
3	309	Deposit	Backfill to 312				
3	310	Structure	Service pipes in concrete duct				
3	311	Deposit	Fill of 312				
3	312	Cut	Service trench (drains)				
3	313	Deposit	Natural clay/brickearth				
3	314	Deposit	Natural gravel				
3	315	Deposit	313 Re-deposited				
3	316	Cut	Construction cut				
3	317	Structure	Brick Footings filling 316				
3	318	Structure	Concrete Foundations				
3	319	Structure	Concrete structure				
3	320	Deposit	313 Re-deposited				
3	321	Deposit	Backfill of 316				
3	322	Structure	Rubble Foundations for 317, filling 316				

APPENDIX 2 POTTERY CATALOGUE

CONTEXT NUMBER	CONTEXT DATE	WARE	WARE DATE-RANGE	VESSEL TYPE	SHERD TYPE	RIM DIAMETER (mm)	RIM PERCENT	WEIGHT (g)	SHERD COUNT	CROSS-FIT No.	COMMENTS
101	19C	English Tin-glazed	1600-1800	unidentified	body			1	1		blue-painted
101	19C	Creamware	1640-1880	square dish	profile			8	2		
101	19C	Refined Earthenware	1800-1900	unidentified	body			8	2		
101	19C	Terracotta	1800-1900	flower pot	rim	200	7	186	2		mortar adhering
113	17/18C	English Tin-glazed	1600-1800	misc	body			50	16		plain white.abraded
113	17/18C	English Tin-glazed	1600-1800	misc	rim	0	30	18	5		plain white
113	17/18C	English Tin-glazed	1600-1800	misc	base			18	2		plain white
113	17/18C	English Tin-glazed	1600-1800	jar	base			46	2		plain white.one vessel
113	17/18C	Post-medieval redware	1580-1900	unidentified	body			38	1		
123	18/19C	English Tin-glazed	1600-1800	unidentified	body			24	7		plain white
123	18/19C	English Tin-glazed	1600-1800	jar	profile	0	5	16	1		plain white.ointment pot
123	18/19C	Creamware	1740-1880	unidentified	body			4	1		
123	18/19C	Transfer printed	1780-1900	unidentified	body			9	1		blue transfer
131	17/18C	Post-medieval redware	1580-1900	unidentified	body			24	1		
135	17/18C	English Tin-glazed	1600-1800	unidentified	body			1	1		blue-painted
138	17/18C	English Tin-glazed	1600-1800	dish	profile	200	9	74	2		blue-painted
138	17/18C	English Tin-glazed	1600-1800	dish	profile	240	5	33	1		blue-painted
138	17/18C	English Tin-glazed	1600-1800	dish	profile	240	20	84	4	1	blue-painted
138	17/18C	English Tin-glazed	1600-1800	dish	rim	240	7	15	1		blue-painted
138	17/18C	English Tin-glazed	1600-1800	misc	base			63	4		plain white
138	17/18C	English Tin-glazed	1600-1800	misc	body			18	4		plain white.abraded
139	18C	Creamware	1600-1800	dish	rim	240	7	9	1	1	blue-painted
139	18C	Chinese Porcelain	1740-1880	unidentified	handle			6	1		
139	18C	English Tin-glazed	1650-1900	unidentified	body			2	1		
140	17/18C	Post-medieval redware	1580-1900	misc	body			5	1		plain white
140	17/18C	Post-medieval redware	1580-1900	unidentified	body			36	2		clear glaze
140	17/18C	Post-medieval redware	1580-1900	unidentified	body			8	1		green glaze

CONTEXT NUMBER	CONTEXT DATE	WARE	WARE DATE-RANGE	VESSEL TYPE	SHERD TYPE	RIM DIAMETER (mm)	RIM PERCENT	WEIGHT (g)	SHERD COUNT	CROSS- FIT No.	COMMENTS
140	17/18C	Post-medieval redware	1580-1900	mug	body			2	1		
140	17/18C	Border ware green-gl	1550-1700	unidentified	base			26	1		
140	17/18C	Border ware yellow-gl	1550-1700	unidentified	body			8	1		
141	17/18C	English Tin-glazed	1600-1800	dish	base			3	1		blue-painted
141	17/18C	Post-medieval redware	1580-1900	bowl	base			81	1		
142	17/18C	Post-medieval redware	1580-1900	unidentified	body			2	1		

APPENDIX 3 CLAY PIPE CATALOGUE

Cxt	B	S	M	Date	Form	64	Bur	X	M4	Rim	TT	TF	CN	SUR NAME	Other	P	T	M	Decoratio n	Comments
101		1		1680-1750			5	0												
101		1		1610-1850			4	0											Leaves	Stem just opening to bowl with faint, blurred, leaves at junction and along stem seams.
101		1		1780-1850			4	0												Thin stem, most likely 1780-1820 period.
104		1		1610-1750			6	0												Fragment discoloured a strong terra-cotta all over, including broken ends (but core fabric white). Probably from burning after the pipe has been broken. Strong taper to stem.
113	3	1		1700-1770	25		5	0	0	0	CW		R	C		HS	R	M		Most likely date late C17th to early C18th Three fitting bowl frags (recent breaks) joining 1 long stem frag (old break) to give 12cm stem surviving. Typical London area product.
113	1			1700-1770	25		5	0	0	0	CW		R	T		HS	R	M		Quite a large, full bodied form with faint mould line around rim.
113	2			1700-1770			5	0												
113	4			1700-1800			4	0												Could well all be contemporary with the bowls.
123	1			1680-1750			5	0												
123	4			1700-1820			4	0												Three quite thin, small fragments suggesting fairly disturbed context, probably of later C18th date.
131	1			1610-1700			6	0												Probably late C17th, residual in this context.
131	2			1700-1770			5	0												
131	3			1700-1770			4	0												One piece badly burnt and discoloured.
132	2			1700-1770			5	0												One piece discoloured, probably from burning.
132	1			1700-1770			4	0												Badly burnt, discoloured and with some encrustation.
132	1			1640-1690			8	0												Large bore and rather oval stem section towards mouthpiece suggests a later C17th date for this piece.
134	1			1700-1800			4	0												Burnt and discoloured. Most likely second half of C18th.
134	2			1700-1800			5	0												Burnt and discoloured. Most likely second half of C18th.
135	1			1700-1770			6	0												Burnt fragment.
136	1			1610-1770			5	0												Most likely an C18th fragment (1700-1770).
138	1			1680-1770			6	0												
138	3			1700-1770			5	0												Two of these pieces join.
138	1			1700-1770			5	G												One piece of polished stem - nice glossy finish but hardly any burnish lines. May be buffed more than stroke burnished. Unusual in London area assemblages of this date.
139	1			1700-1770	25		5	0	+	0	C		R	T		HS	R	M		Different mould to example from 113. Upright '+' in relief at bottom of bowl interior.
139	4			1700-1770			5	0												Reasonably long fragments - up to 8cm.

Cxt	B	S	M	Date	Form	64	Bur	X	M4	Rim	TT	TF	CN	SUR NAME	Other	P	T	M	Decoratio n	Comments
139		1		1700-1770		4/5	0													Long fragment (101mm) with a marked curve in it. Either a very early curved pipe or a poor warped one. Stem bore 4/64" at one end and 5/64" at the other.
140	1			1700-1770	25	5	0	0	-				R	T		HS	R	M		Damaged bowl from different mould to examples in contexts 113 and 139. Bowl damaged but a large and chunky form. Probably first half of C18th.
140		1		1660-1720		7	0													Probably a late C17th stem fragment. Residual in this context.
140		3		1680-1770		6	0													Could well all be contemporary with bowl, ie, first half of C18th.
141		1		1680-1770		4	0													
141		1		1680-1770		5	0													
142		1		1680-1770		5	0													

APPENDIX 4 BIBLIOGRAPHY AND REFERENCES

- Atkinson, D R. & Oswald, A. 1969, 'London clay tobacco pipes', *Journal of the British Archaeological Association*, **XXXII**, 171-227.
- Boessneck, J. 1969 Osteological Differences in Sheep (*Ovis aries* Linné) and Goat (*Capra hircus* Linné), in D. Brothwell and E. Higgs (eds) *Science in Archaeology*, Thames and Hudson. 331 - 358
- Higgins D A, 1981, 'Surrey clay tobacco pipes' in P J Davey (ed.), *The Archaeology of the Clay Tobacco Pipe*, VI. British Archaeological Reports, Oxford, No 97, 189-293.
- Higgins D A, 1987. *The interpretation and regional study of clay tobacco pipes: a case study of the Broseley district*, PhD Thesis submitted to the University of Liverpool, 628pp.
- Higgins D A, 1998, 'Clay pipes' in G D Keever & C Bell, 'The excavation of a trial trench across the moat at Hampton Court Palace', *Transactions of the London and Middlesex Archaeological Society*, **47** (for 1996), 150-1 (145-56).
- Higgins, D A & Davey, P J, 1994, *Draft guidelines for using the clay tobacco pipe record sheets*, unpublished draft, (copy deposited in the site archive).
- Prummel, W and Frisch, H.-J. 1986 A Guide for the distinction of species, sex and body size in bones of sheep and goat, *Journal of Archaeological Science* **XIII**, 567 - 77
- Silver, I.A., 1969 The Ageing of Domestic Animals, (eds D. R. Brothwell and E. S. Higgs) in *Science in Archaeology*, Thames and Hudson 283 -302

APPENDIX 5 SUMMARY OF SITE DETAILS

Site name: Lower Car Park and Tennis Court Lane, Hampton Court Palace.
Site code: HCP 29 00
Grid reference: TQ 156 687
Type of evaluation: 3 small hand excavated test pits
Date and duration of project: 14-18 August 2000

Summary of results: An infilled medieval moat, a cobbled surface, a late C17th wall, concrete and brick foundations, service trenches.
Location of archive: The archive is currently held at OAU, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with Historic Royal Palaces.

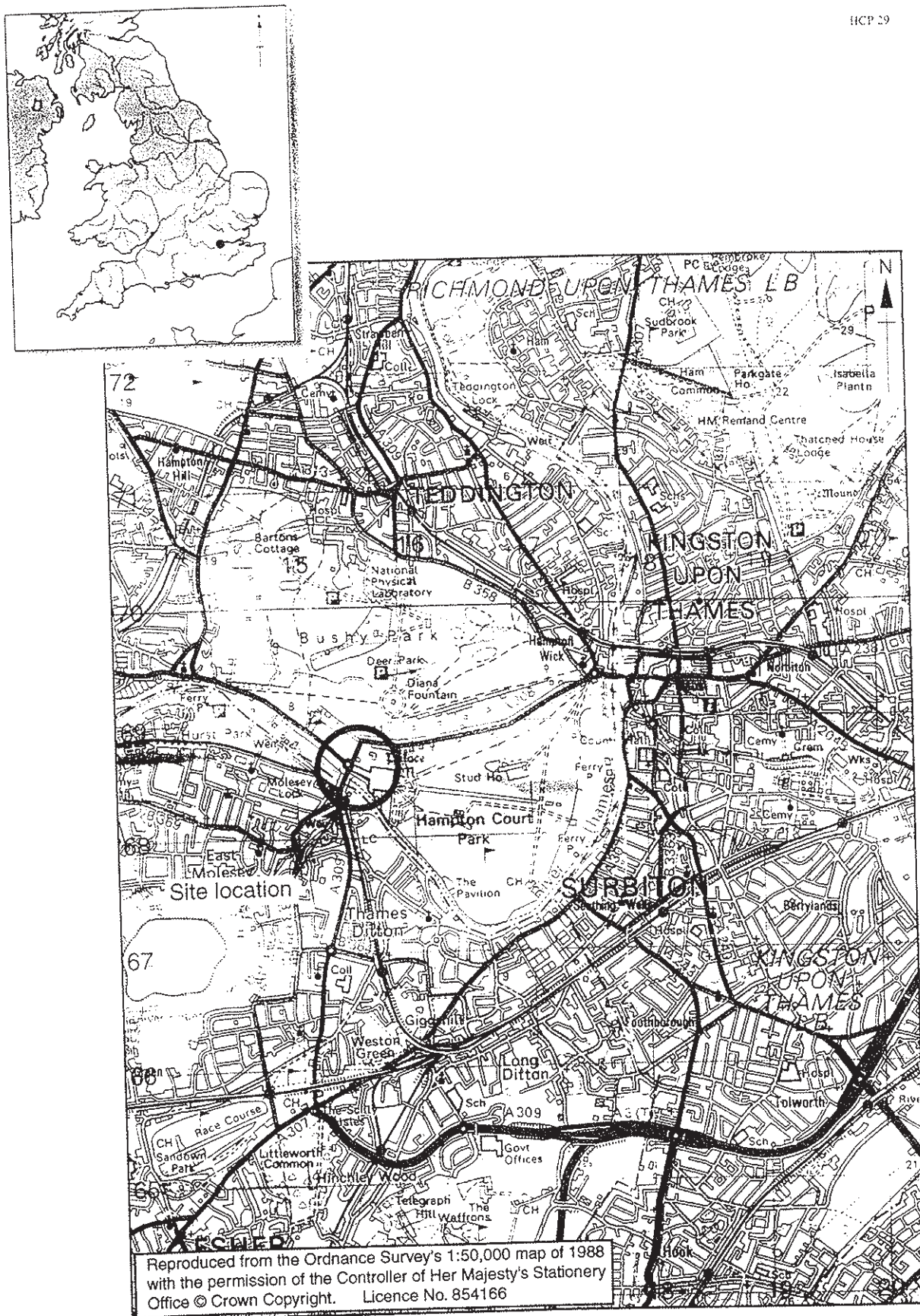
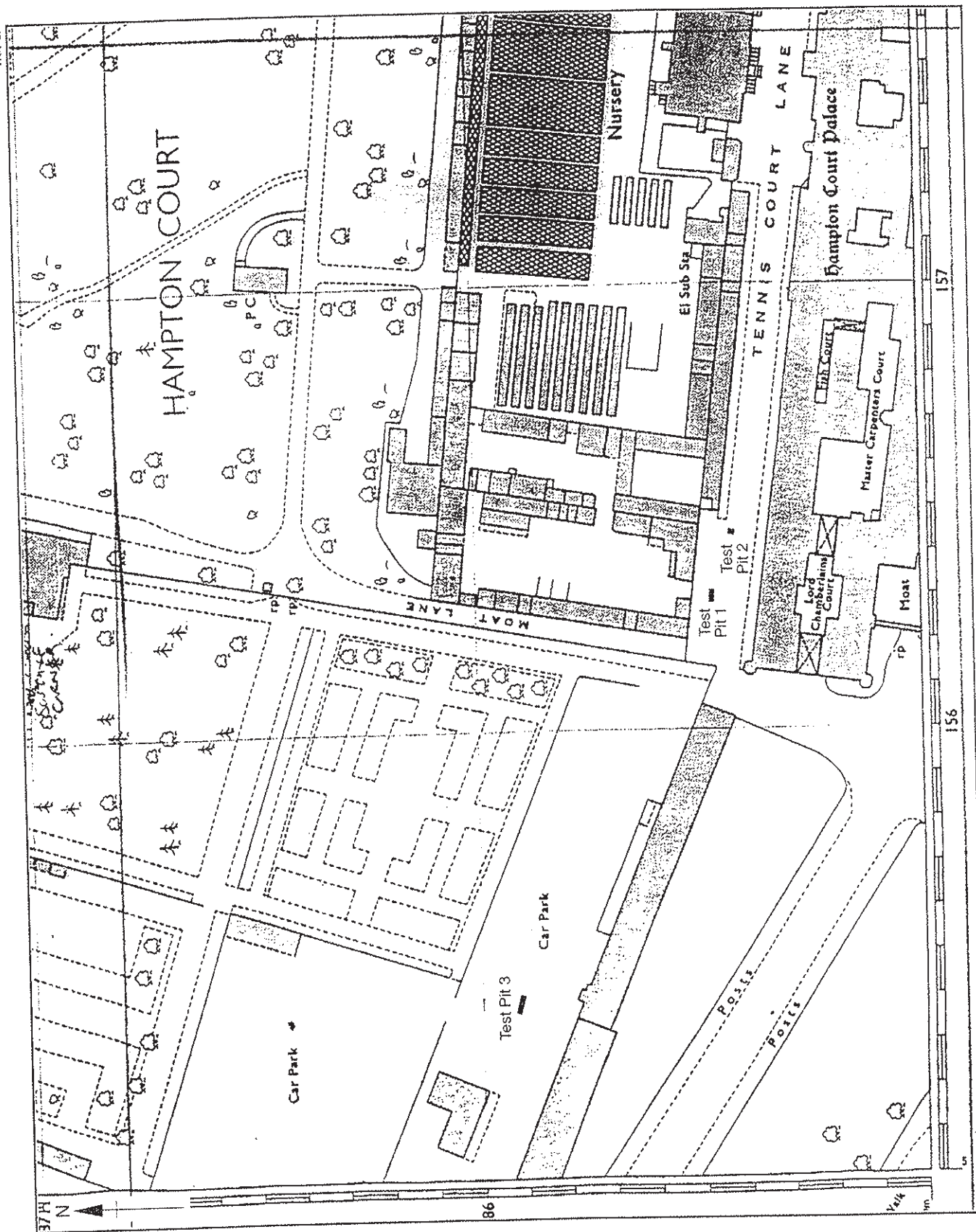
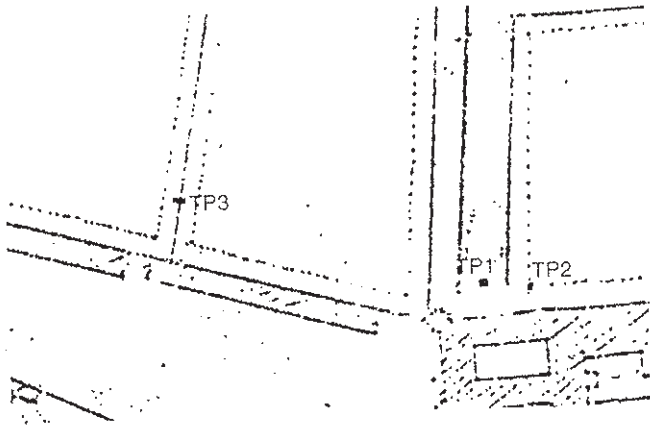
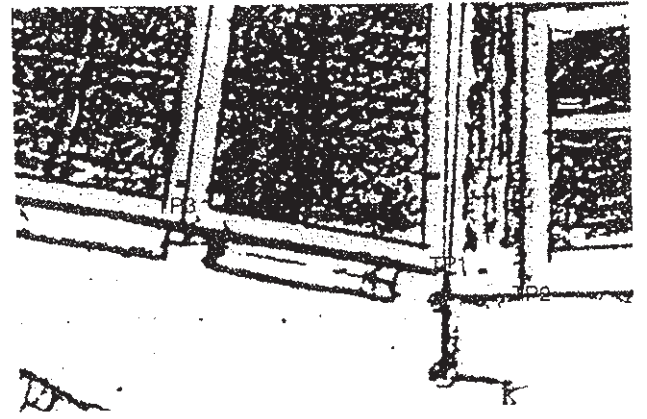


Figure 1: Site location.

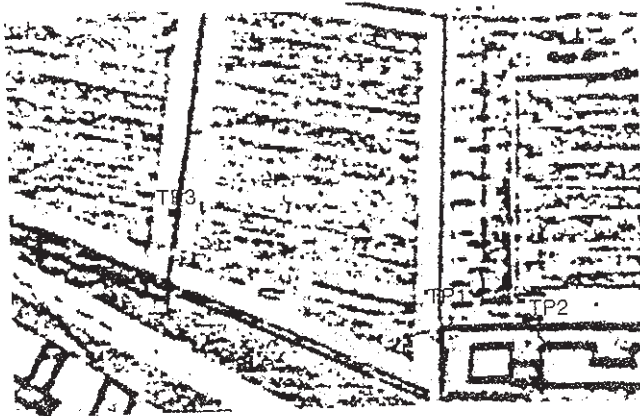




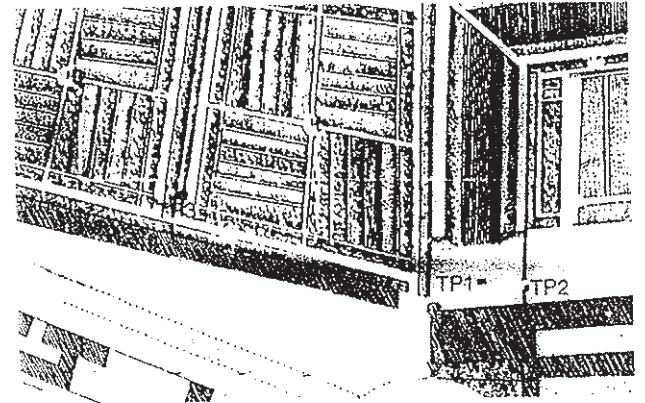
WKS 34/112 c.1690-91



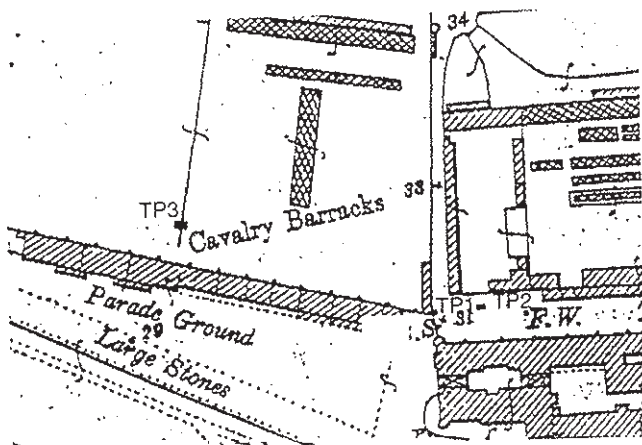
Talman c.1698



Bridgeman c.1710



Roque c.1736



O.S. 1897

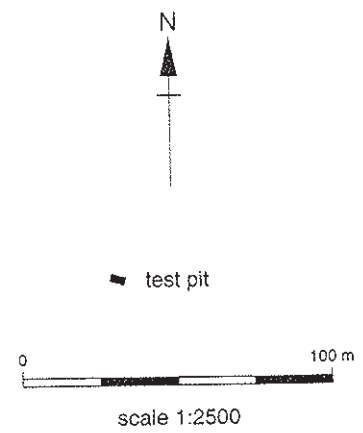
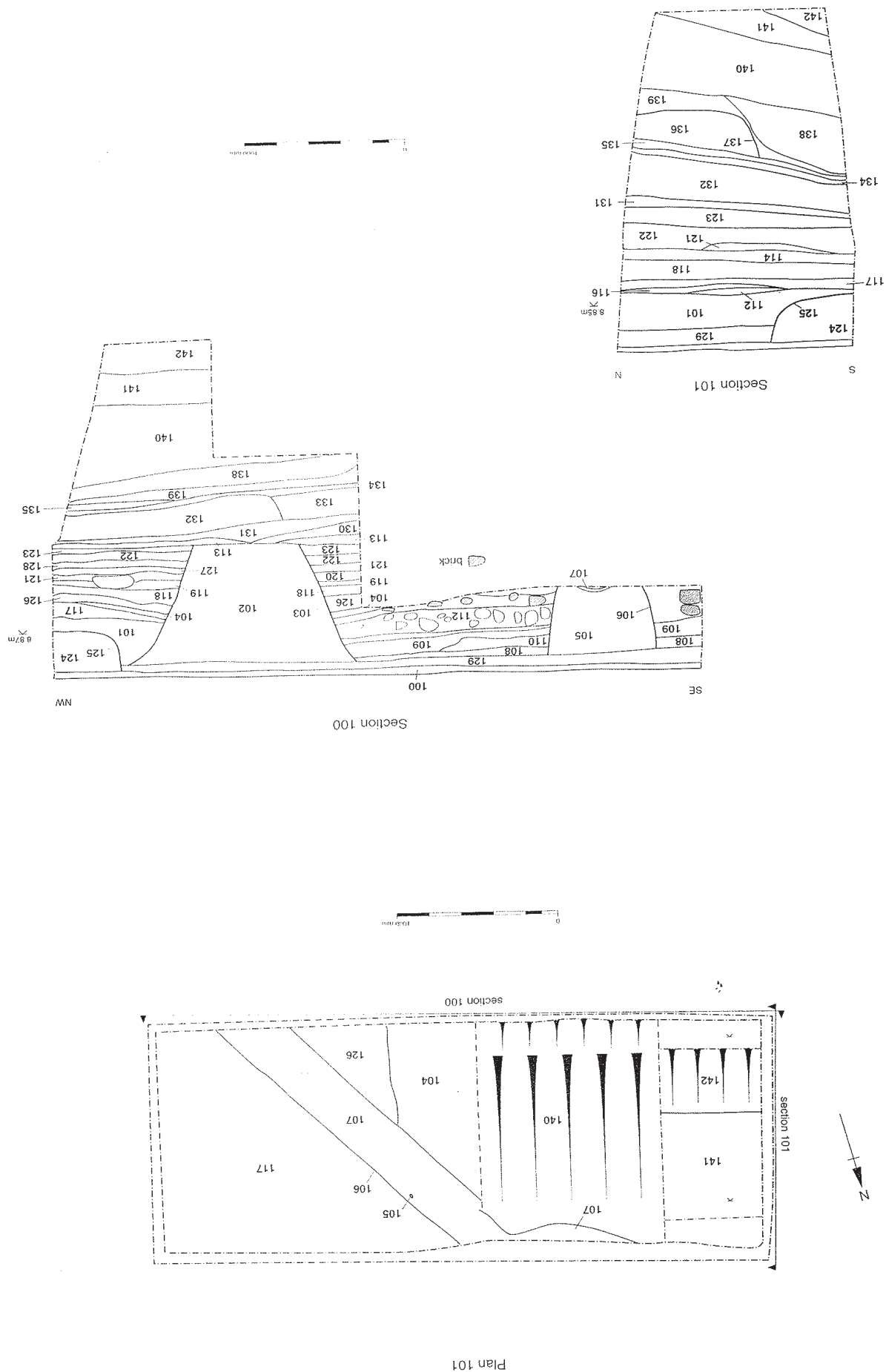
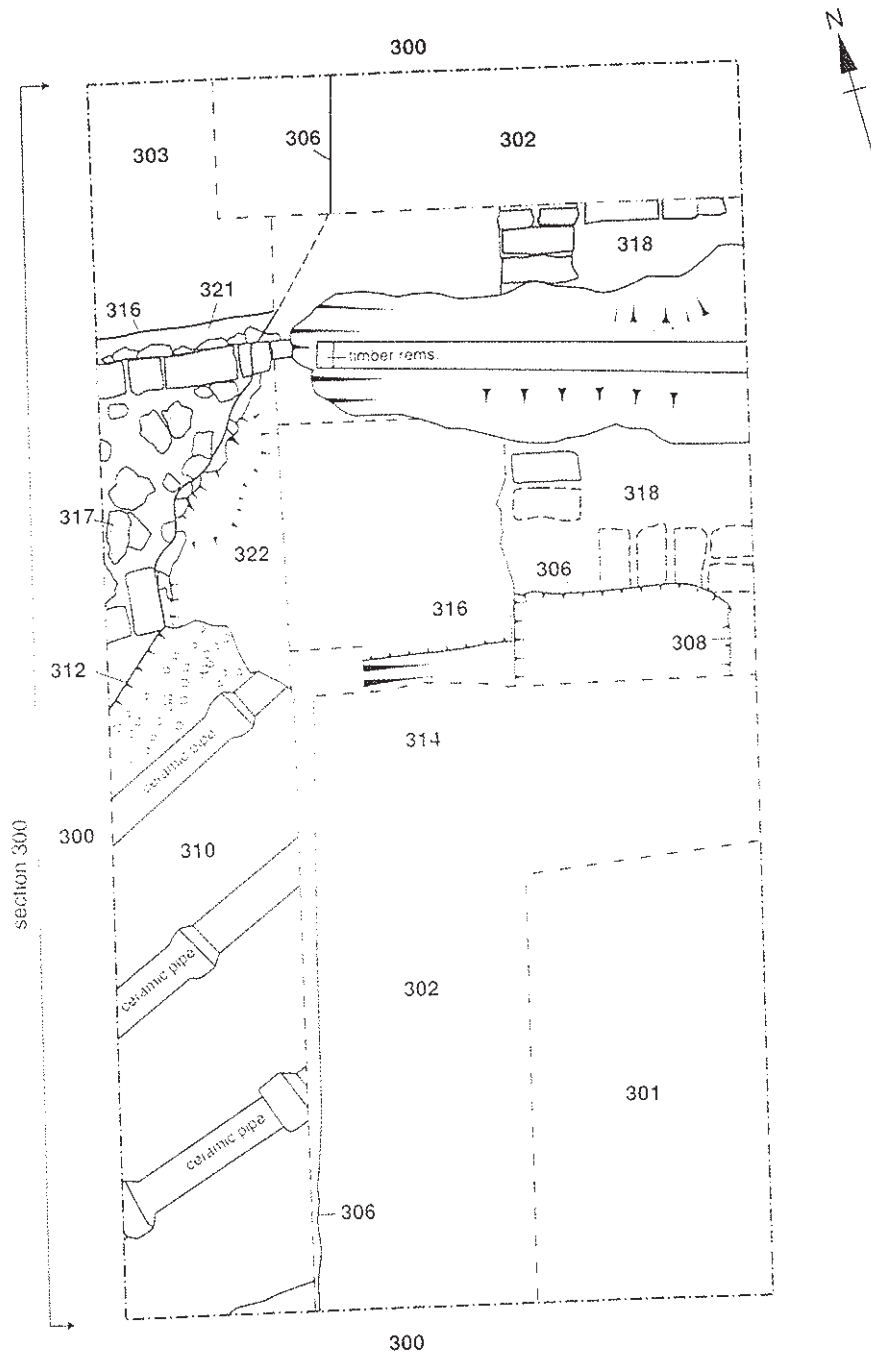


Figure 3: Set of 5 historic maps provided with Test Pit locations as indicated.

Figure 4: Trench 1, plan and sections.





Section 300

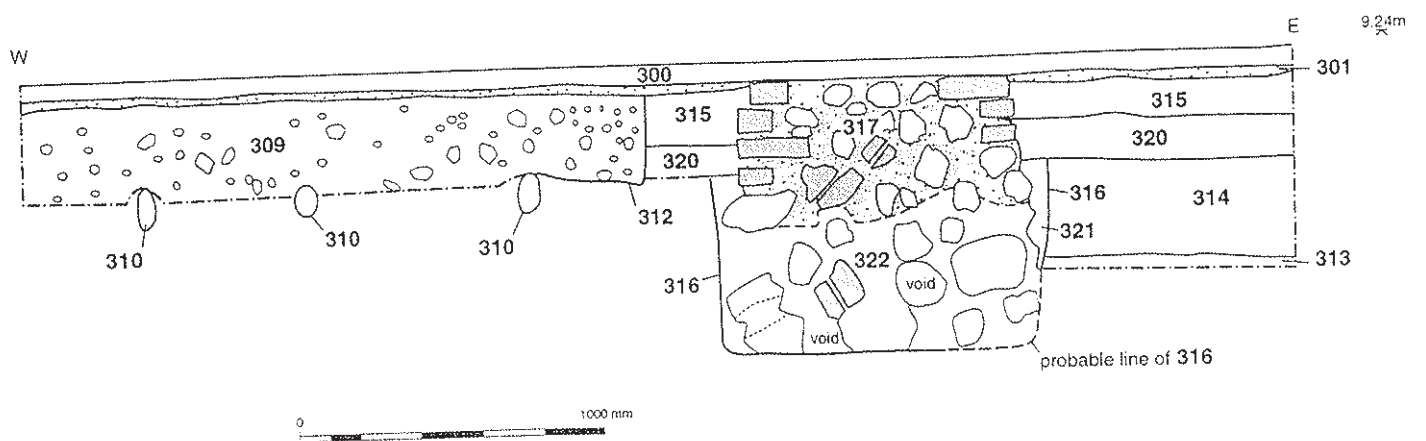


Figure 5: Trench 3, plan and sections.



OXFORD ARCHAEOLOGICAL UNIT

Janus House, Osney Mead, Oxford, OX2 0ES

Tel: 01865 263800 Fax: 01865 793496
email: postmaster@oau-oxford.demon.co.uk



Director and Chief Executive: David Jennings B.A., M.I.F.A. Oxford Archaeological Unit Limited.
Private Limited Company Number: 1618597 Registered Charity Number: 285627.
Registered Office: Janus House, Osney Mead, Oxford OX2 0ES