



MIDDLE SAXON AND LATER ARCHAEOLOGICAL REMAINS IN WHITEHALL

Paw Jorgensen

With contributions by Jonathan Butler, Kevin Hayward, Chris Jarrett and Kevin Rielly

SUMMARY

Archaeological investigations undertaken during the streetscape improvements in Whitehall revealed the remains of several periods of activity. Middle Saxon activity most likely associated with that previously found at the Old Treasury Building in the 1960s was revealed on Whitehall opposite the west end of Horse Guards Avenue. Elsewhere masonry associated with York Place, the Archbishop of York's official residence in London, and Whitehall Palace was found. Later remains consisted of buildings which were constructed in the 18th and 19th century following the destruction of Whitehall Palace in two fires at the end of the 17th century.

INTRODUCTION

Pre-Construct Archaeology was commissioned by Atkins Heritage acting on behalf of the City of Westminster to undertake a watching-brief during streetscape improvements along Whitehall and the adjoining streets (Fig 1). The work was undertaken between May 2007 and October 2010. This report presents the results of the archaeological monitoring, which was carried out during the excavation of 99 trenches. The site archive will be deposited with the London Archaeological Archive and Research Centre (LAARC) under site code WQH 07.

The site was centred at National Grid Reference TQ 3015 7996 and can best be defined as the streets lying between Horse

Guards Road to the west, the Embankment to the east, Parliament Square to the south and Great Scotland Yard to the north (Figs 2, 2a, 2b). Bordering upon the site are governmental offices, mostly dating to the late 19th and 20th centuries, many of which are Listed Buildings. In total 78 Listed Buildings are located immediately adjacent to the site; of these, 14 are Grade I listed, 17 Grade II* listed, and 47 Grade II listed; these include Queen Mary's Steps, the Banqueting House, the Ministry of Defence Main Building, and the Cabinet Office, Privy Council and Treasury Building, all of which to varying degrees have incorporated part of the fabric of Whitehall Palace into the current buildings and structures.

Furthermore, the entire site lies within the *Lundenwic* and Thorney Island Area of Special Archaeological Priority and immediately to the south is the World Heritage Site of Westminster Palace, Westminster Abbey and St Margaret's Church (WHS number 462). St James's Park to the west and Victoria Embankment Gardens to the east are both Registered Parks and Gardens; the former Grade I and the latter Grade II*.

The watching-brief recorded in one of the deeper trenches, along Whitehall itself, a number of pits and a palaeochannel of Middle Saxon date, whilst across the investigation area a number of structural remains pertaining to Whitehall Palace as well as fragments of buildings pre- and post-dating

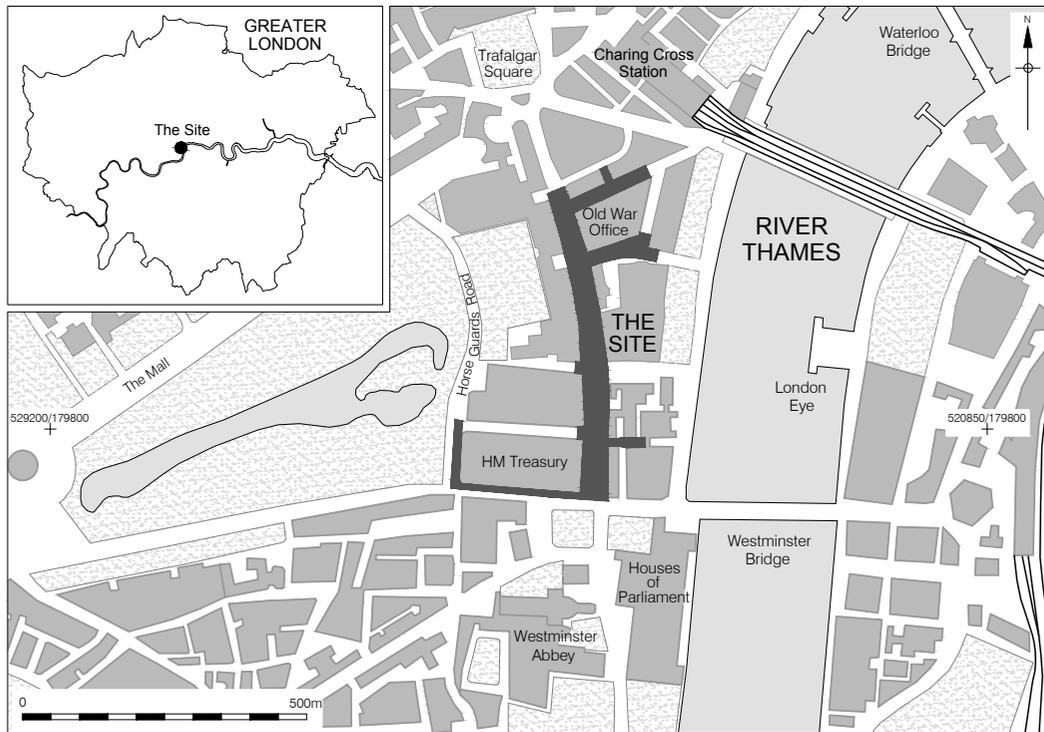


Fig 1. Site location

the royal residence were observed. Pre-palace structures recorded included part of the kitchen and Great Hall of York Place while the post-palace remains are mainly foundations of buildings associated with the redevelopment of the area in the 18th and 19th centuries. However, due to the limited depth of the majority of the trenches the vast majority of the deposits excavated related to the recent installation of services and post-medieval levelling of the ground in preparation for the construction of today's Whitehall (Fig 3).

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Roman

Little evidence for Roman activity has been discovered by previous work within the area and most of what has been recovered has consisted of redeposited material. However, the Roman road Akeman Street, which approximately followed the alignment of the

Strand, is postulated to have passed north of the site somewhere in the vicinity of present day Trafalgar Square. The road covered the c.7 mile stretch between Ludgate in the east and Hammersmith in the west (Margary 1957, 51).

It has been suggested that a river crossing lay to the south of the site, near where Westminster Abbey stands today. While the alignment of Watling Street does suggest this location for a crossing point, there is at present a lack of physical evidence to support this theory (Sloane *et al* 1995, 369). Roman finds have been recovered from the vicinity, namely on Thorney Island to the south.

Saxon

The study area is situated approximately 1km south-west of the Middle Saxon (c.AD 650–850) settlement of *Lundenwic*. Even so, many of the previous archaeological investigations carried out in the vicinity of Westminster Abbey have recorded residual Middle Saxon material and excavations at the Old Treasury

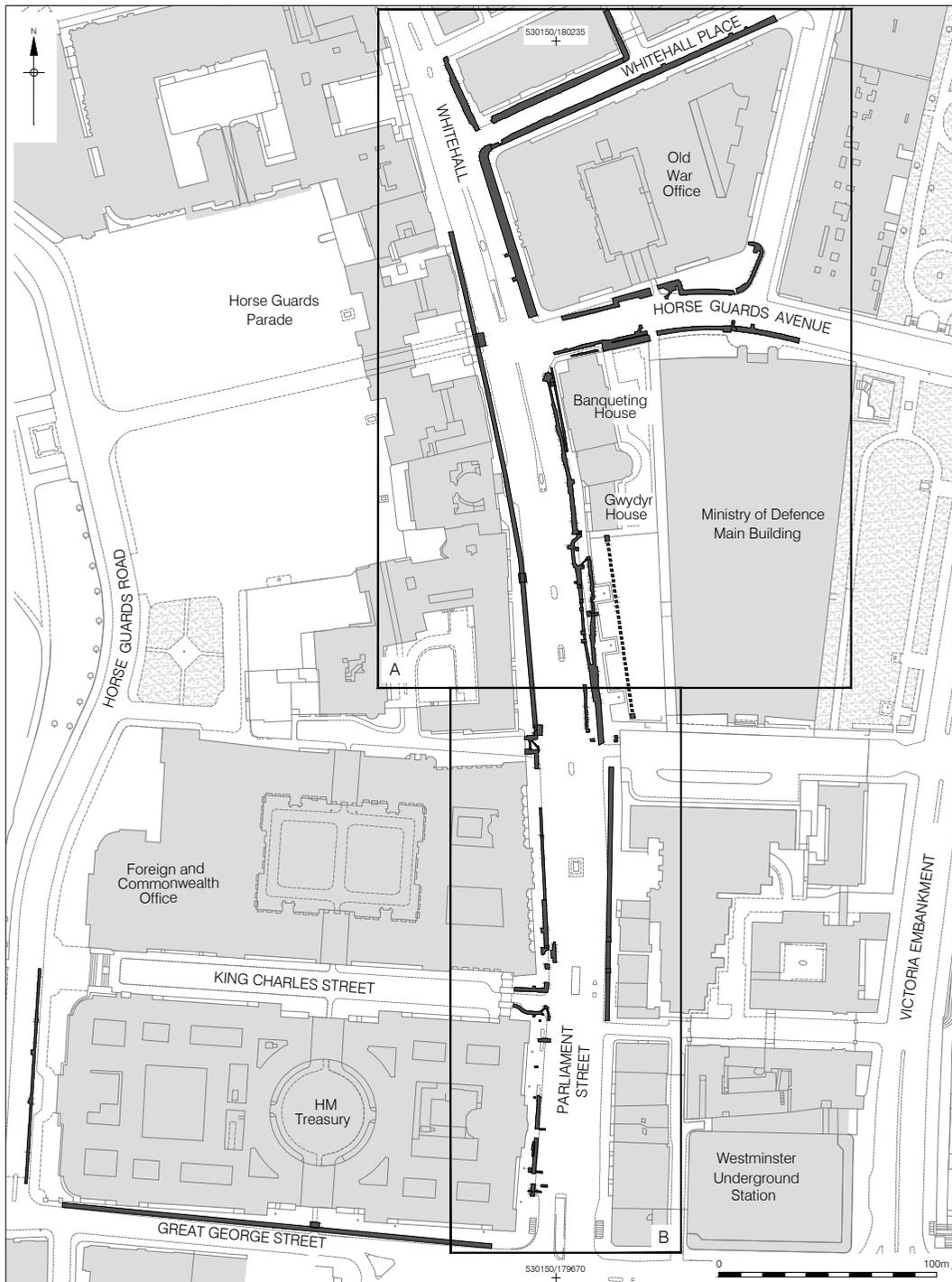


Fig 2. Whitehall streetscape trench location plan

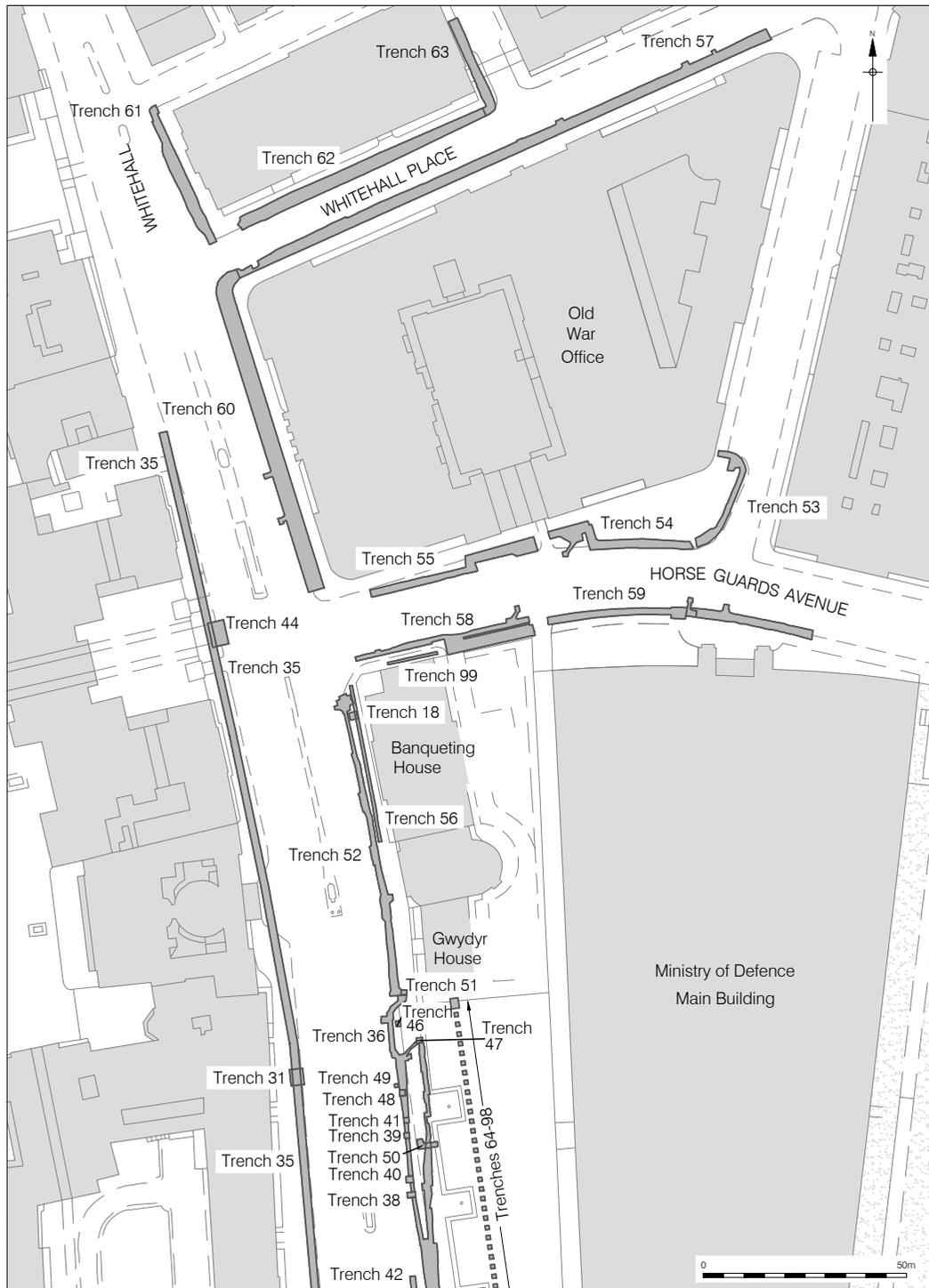


Fig 2a. Trench location detail (northern section)

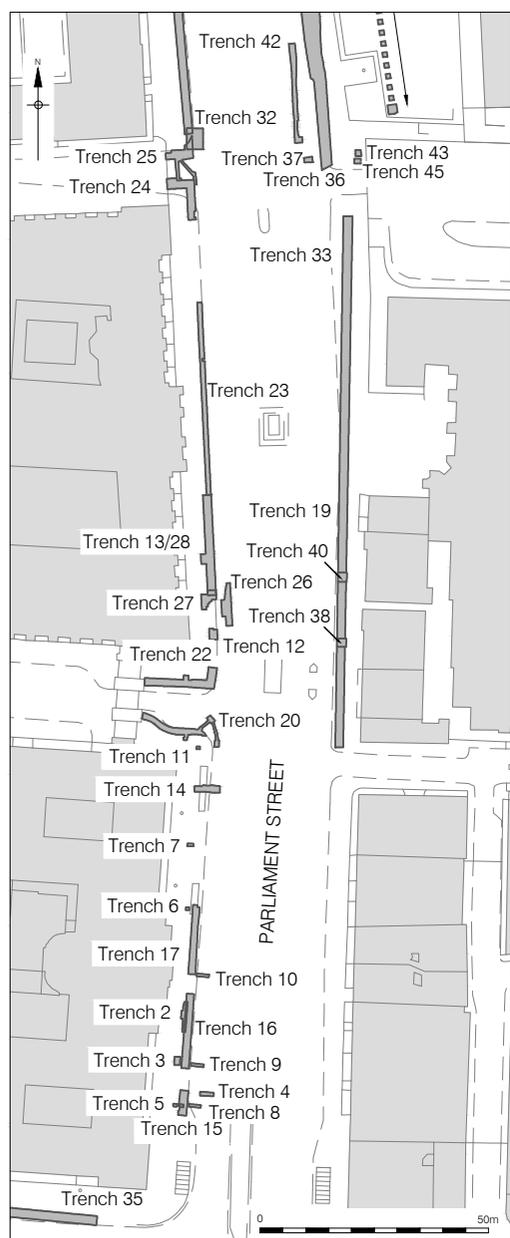


Fig 2b. Trench location detail (southern section)

Building north of Downing Street revealed several Middle Saxon buildings (Green & Cowie 2008, 91–5).

It has been suggested that Thorney Island was home to a small Middle Saxon monastery. This suggestion is based on the existence of a charter of doubtful authenticity recording

a land grant made in AD 785 by King Offa of Mercia to St Peter's of Westminster (Sawyer 1968, no. 124), and on residual archaeological finds (Thomas *et al* 2006, 41). While the archaeological evidence does suggest that the island was permanently occupied during the Middle Saxon period, to date no structural remains of the conjectured monastery have been found (Cowie 2004, 205).

The Middle Saxon buildings recorded during the excavation at the Old Treasury Building have been interpreted as the remains of a high status, possibly royal, hall and associated ancillary buildings. A number of factors have contributed to the interpretation of the site as high status. These include the position of the site roughly mid-way between *Lundenwic* and the conjectured Middle Saxon monastery on Thorney Island; the presence of high status imported pottery; the nature of the faunal assemblage; and the size of the hall uncovered (Cowie & Blackmore 2008, 100).

During the mid-9th century the settlement to the north of Thorney Island seems to have been abandoned. It is possible, though not certain, that activity on the island itself also ceased at this time. This may be a result of intensifying Viking raids during the mid-9th century, or it could be due to rising water levels making the area uninhabitable (Thomas *et al* 2006, 46).

Medieval

The earliest documentary evidence pertaining to the study area comes in the form of a deed dated 1158. It is a grant from Gervase, Abbot of Westminster to Gerin, one of the king's ministers, for land beside the *Enedehithe* (*terram de Ænedetha*) (Mason 1988, 261). *Enedehithe* appears in various spellings throughout the medieval period and appears to have been located just north of Thorney Island along the banks of the River Thames. Throughout the later part of the 12th century additional land in the area of the *Enedehithe*, particularly on both sides of what later became known as *Endiff* or *Endive Lane* (perhaps originally *Enedehithe Lane*), was acquired by members of Henry II's administration. The properties here seem to have been in the occupation of successive Treasurers and Keepers of the Wardrobe (Blanchard 2007, 339).



Fig 3. Working view of the trench outside the Banqueting House along Whitehall, view looking south

The site acquired by Gerin in 1158 was extended by his successors by annexation of the adjoining properties. In the early years of the 1220s the property passed to Hubert de Burgh, first Earl of Kent. By this time the property already contained a substantial residence comprising houses, chapel and stables and other structures (Thurley 1999, 1). In the 1230s the property passed to Hubert's trustees, who, by 1241 had sold it to Walter de Gray, Archbishop of York. Walter later granted the property to the See of York after which it remained the London residence of the Archbishops of York for nearly three centuries (Cox & Norman 1930, 4; Green & Thurley 1987, 64).

Under successive archbishops York Place, as the property had become known, continued to evolve and by the time Thomas Wolsey (later Cardinal Wolsey) took up residence there in 1515 the complex comprised a number of buildings arranged around a central cloister. These included a great hall, kitchens, a chapel, stables, a gatehouse, plus a series of private and public rooms (Thurley 1999, 10–12). Soon after his arrival Wolsey instigated a large scale building programme that would transform York Place from an already substantial messuage into a sumptuous palace.

Post-medieval

Following Wolsey's fall from grace in 1529 his palace at Whitehall was acquisitioned by Henry VIII who spent the next few years acquiring the surrounding parcels of land along both sides of King Street (present day Whitehall). By the end of his reign the complex had grown into one of the largest palaces in Europe. It was sprawled out on both sides of the public road from Charing Cross to Westminster, so two gatehouses, the King Street Gate to the south and the Holbein Gate to the north, were constructed to link the galleries on both sides of the street (Fig 4) (Cox & Forrest 1931, 10).

A total of three temporary banqueting houses were erected within the palace grounds by Elizabeth I. Although built as temporary structures the last of these survived for 25 years until replaced by James I's first banqueting house in 1606. The present-day Banqueting House was designed

by Inigo Jones and constructed in 1622 after the earlier building burnt down in 1619 (Cox & Norman 1930, 116–17, 126).

In 1649, Charles I was publically executed on a temporary scaffold set up in front of the Banqueting House. Whitehall Palace was hereafter turned into a vast complex of parliamentary offices (Thurley 1999). After Charles II's restoration to the throne in 1660 plans to modernise the ageing palace were drawn up. The idea was to base the new palace design around the standing Banqueting House. Although parts of the palace were rebuilt, the plans for a new palace were never realised (Cox & Norman 1930, 36). A survey of the palace was undertaken by Fisher in 1670 and shows the complex as it stood after the Restoration (Fig 5).

Fire swept through the palace in 1691 destroying many of the older buildings. While the 1691 fire only affected a relatively small portion of the palace, another fire in 1698 destroyed much of the eastern half of the palace leaving only the Banqueting House and a few other buildings intact. Following the 1698 fire many of the state offices were removed to the west side of present day Whitehall and the eastern part of the palace grounds was sold off in plots to noblemen of the court and several large houses erected (Cox & Norman 1930, 38, 40).

Following the decision to construct Westminster Bridge in 1735 the majority of the buildings between King Street and the Thames were demolished and the area redesigned to provide a more suitable thoroughfare from Charing Cross to the new bridge, which was completed in 1750. Following the new road layout the island of buildings between King Street and Parliament Street was constructed in the late 1740s to early 1750s (Figs 6–7) (Cox 1926, 1).

During the 19th century the area to the east of Whitehall continued to develop primarily as a residential area, while on the western side of the road larger government buildings started to appear (Fig 8). The Victoria Embankment was completed in 1870 providing convenient access from Westminster Bridge to Charing Cross. By the close of the century clearing of large swathes of land for the construction of the War Office and other government offices had commenced.

Throughout the first half of the 20th

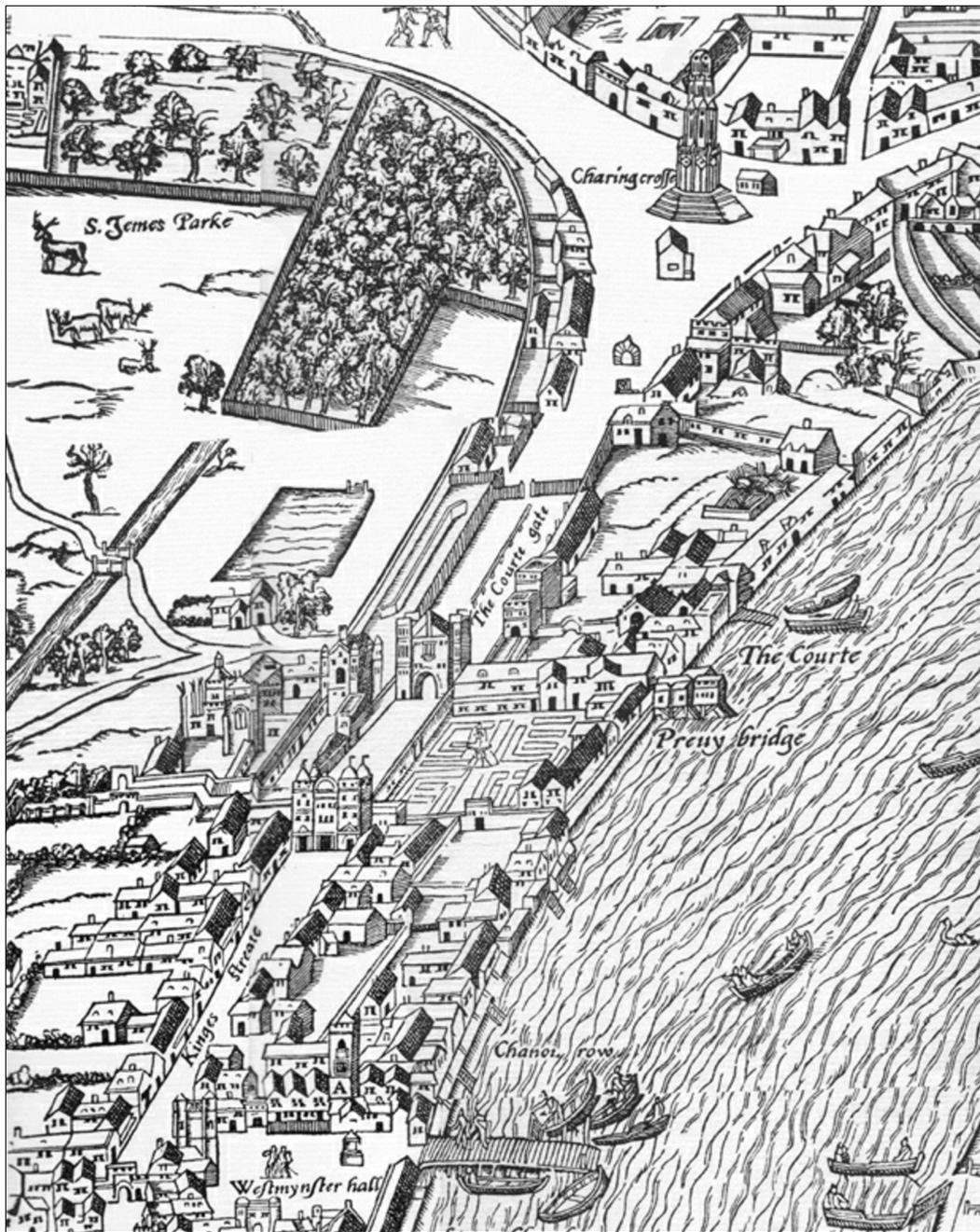


Fig 4. Agas Map c.1562. Two gatehouses are shown straddling King Street, the upper one is the Holbein Gate and the lower one the King Street Gate

century the construction of the new government offices that had started in the later part of the preceding century continued. Construction of The (Old) War Office was

completed in 1906 and the Government Offices on Great George Street were completed in 1908 and 1917. The site now occupied by the Ministry of Defence

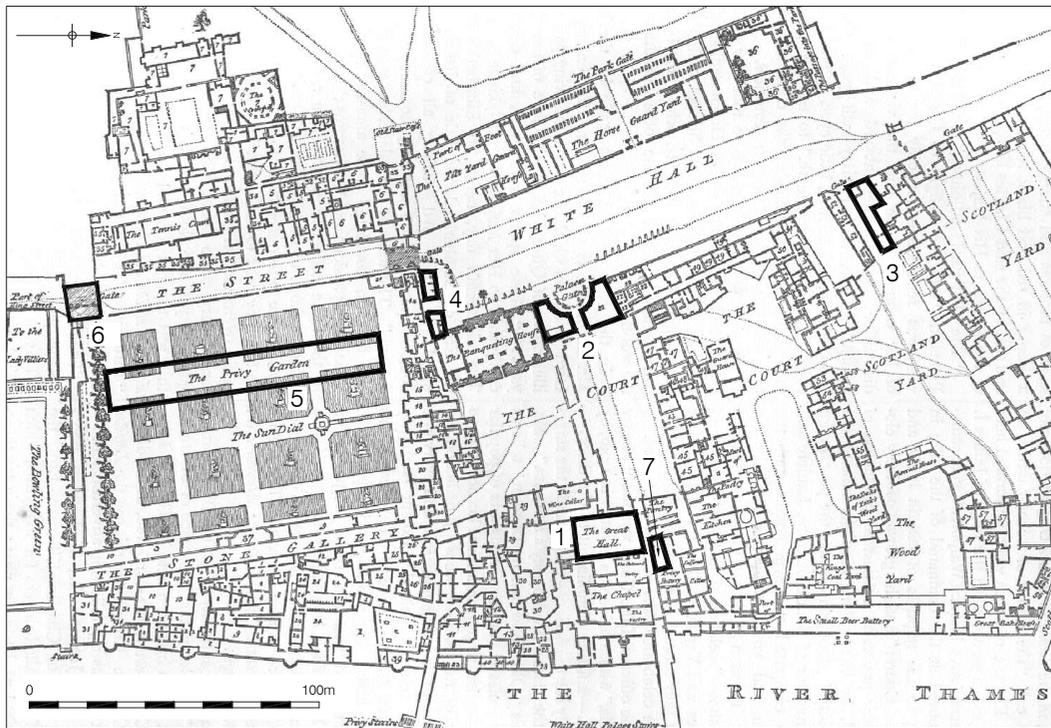


Fig 5. Fisher's 1670 Plan of Whitehall Palace. (1) Great Hall; (2) Court Gate; (3) Lodgings and Office of the Surveyor; (4) Gun platform; (5) Privy Garden; (6) King Street Gate; (7) Kitchen complex

Main Building had been selected for the construction of more government offices in the 1920s, but work was not completed until 1957.

PHASE 1: GEOLOGY AND TOPOGRAPHY

The local geological drift deposits consist of Pleistocene Thames terrace gravels, overlain by brickearth. Along the floodplains of the Thames and the Tyburn alluvium has accumulated. Due to the limited depth of the trenches natural deposits were only encountered in three of them, Trenches 31 and 44 lay on the spur of land that in Saxon times extended into the River Tyburn's northern channel where it met the River Thames (Fig 2), whilst Trench 32 is postulated to lie just on the bank of the Tyburn's northern channel. A brickearth type deposit was observed in Trench 31 at 1.90m OD overlain by a layer of fluvial sand which was observed at a similar top height.

Similar alluvial sands and gravels with a top height of 1.78m OD were seen overlying the natural sand in Trench 44, which would suggest that the area was subject to periodic flooding. In Trench 32 sandy and gravel deposits were encountered at a top height of 2.85m OD.

The site is located in an area where the River Tyburn met the River Thames. The conjectured Thames riverfront during the Middle Saxon period roughly follows the line of present day Whitehall Court (Cowie & Blackmore 2008, fig 93). The southern part of the area of investigation was located on a gravel eyot or island known as Thorney Island which was formed by the bifurcation of the Tyburn where it met the Thames (Thomas *et al* 2006, 9). The shape of Thorney Island has changed over time (see Sidell *et al* 2000, 62, fig 28) as erosion by the rivers and marine regression have allowed more of the island to become accessible as the water-level receded. By the Middle Saxon period it is likely that Thorney Island extended just to the north of

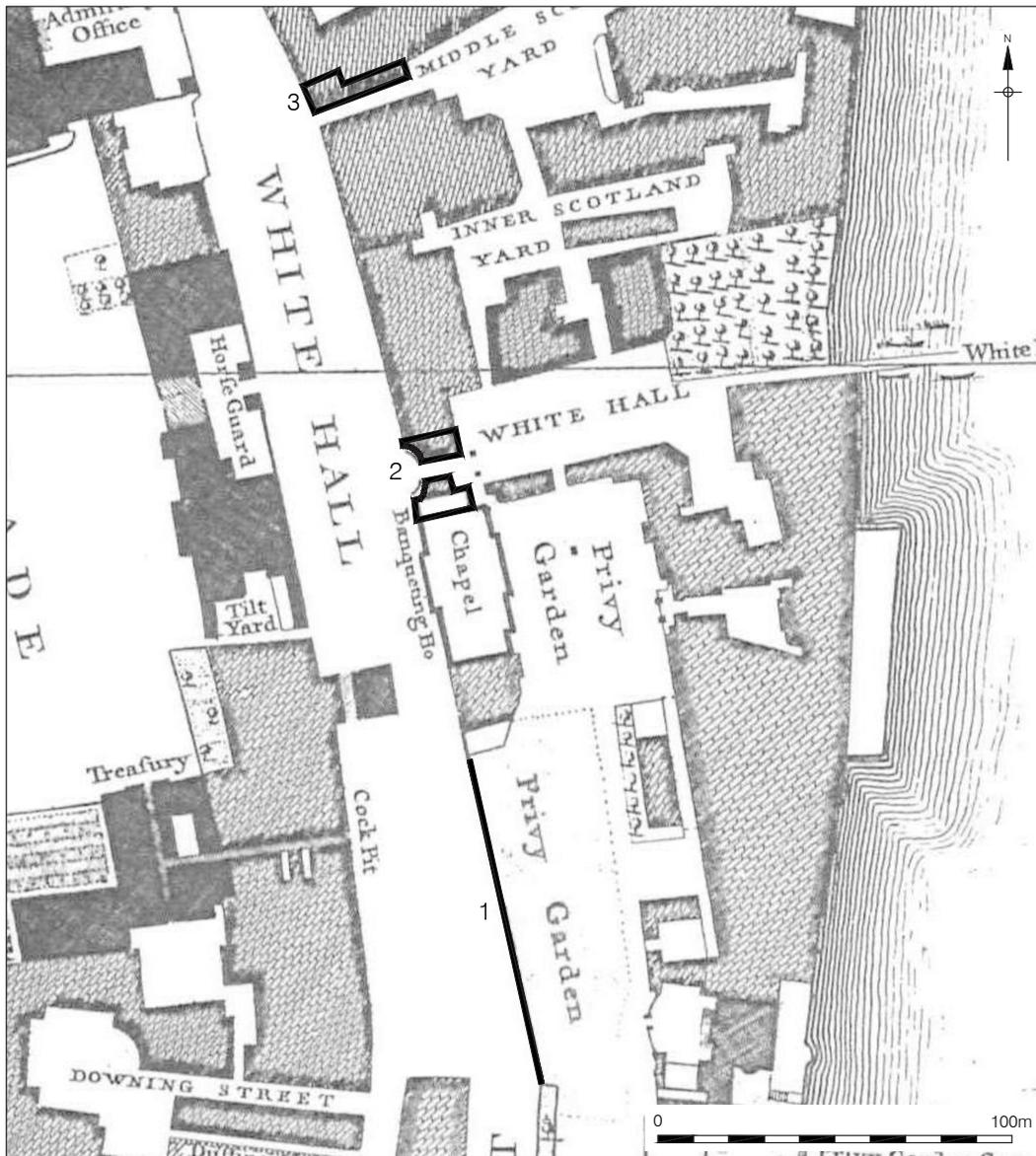


Fig 6. Rocque's 1746 London map, showing the Whitehall area. (1) Privy Garden wall; (2) Court Gate; (3) Lodgings and Offices of the Surveyors

Great George Street with the area currently occupied by the Treasury and Foreign and Commonwealth Office within the Tyburn channel which may have extended just to the north side of Downing Street (Thomas *et al* 2006, fig 4). Thus most of the southern half of the study area would have been within the Tyburn channel during the Middle Saxon period. The main area on either side of

Whitehall lay on a gravel spur that extended into the channel where the Tyburn met the Thames and it was on this gravel spur that the possible Middle Saxon royal hall lay (Green & Cowie 2008, 90–100, figs 93–94). Throughout the medieval period the site was low lying and prone to flooding, prompting dumping to raise the ground level and reclamation throughout this and later periods.

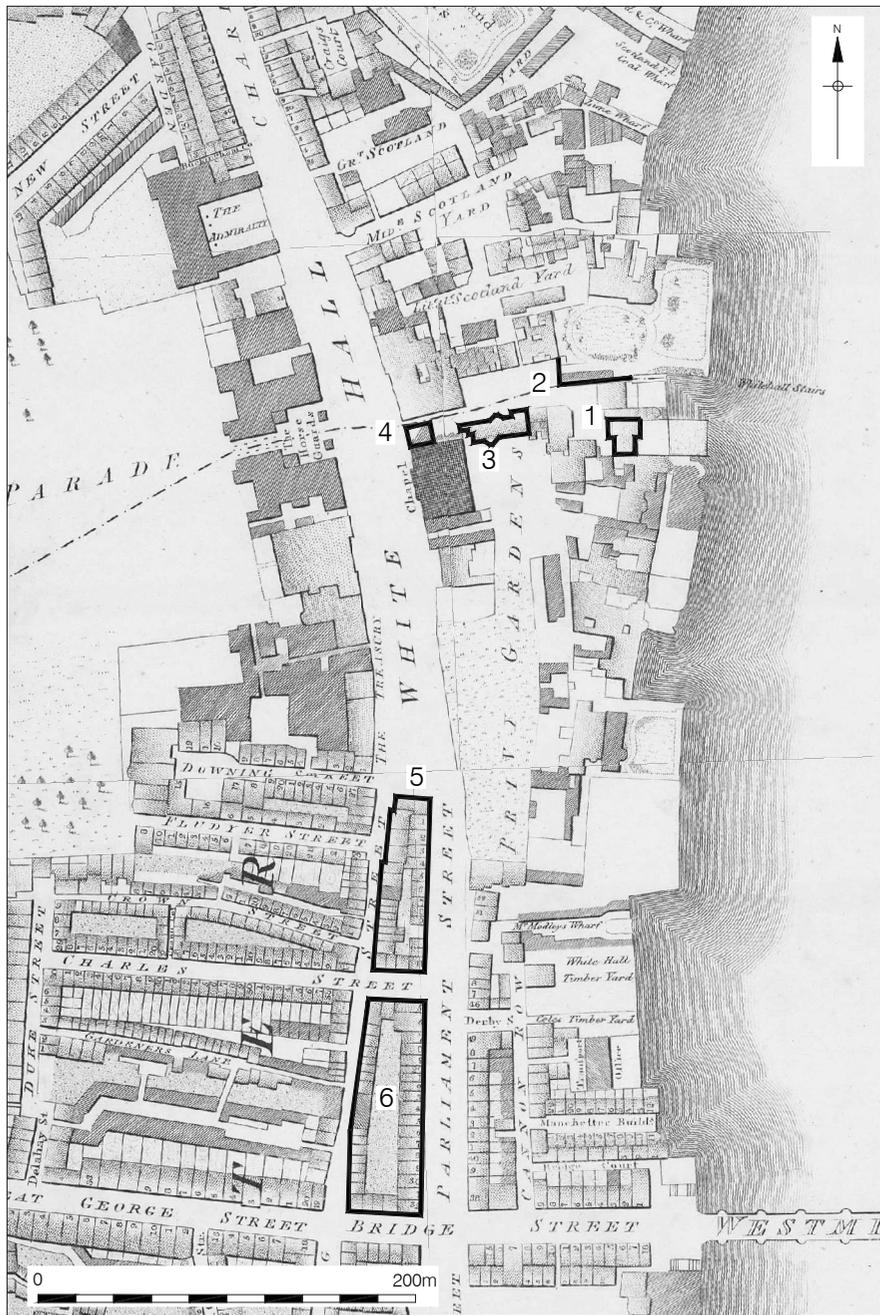


Fig 7. Horwood 1792–99 London map, showing the Whitehall area. (1) Taylor House; (2) Fife House garden wall; (3) Pelham House; (4) Carrington House; (5) King Street and Parliament Street – north; (6) King Street and Parliament Street – south



Fig 8. First Edition Ordnance Survey Map 1869–1872. (1) New lodgings and office of Surveyor; (2) Whitehall Place

ARCHAEOLOGICAL SEQUENCE

Introduction

Whilst the archaeological investigations in Whitehall covered a large area many of the observations were very limited in nature. Most of the trenches were narrow and very shallow, often only 0.50m below modern pavement level. This meant that often only the tops of masonry walls were visible and also only seen in a short length across the width of the trench. Modern services and later walls also had heavily truncated the remains. Therefore, assigning a date and interpretation to many of the structures has been very difficult. Brick walls have been assigned to a particular phase based on their fabric and the stylistic date of their bricks; however, bricks are notoriously difficult to date accurately and are often subject to reuse. The walls have been linked to known buildings where possible by overlaying the plans of their remains onto a series of historic maps, most notably the survey of Whitehall Palace by Fisher in 1670, Rocque's map of

1746, Horwood's Map of 1792–9, and the First Edition Ordnance Survey Map of 1868–72. However, many of these maps, especially the earlier ones, are inaccurate and require manipulation as there are so few buildings surviving from the early post-medieval period, with the obvious exception of the Banqueting House, to provide precise linkage between the historic and modern mapping. Thus what follows should be considered the most plausible interpretation of the data.

PHASE 2: MIDDLE SAXON (c.AD 650–850)

The only evidence for Saxon activity was seen in one of the deep trenches excavated in the northern portion of the site, directly opposite the junction of Horse Guards Avenue and Whitehall (Figs 9–10). Here an east–west-aligned palaeochannel cut into the natural sandy gravels. It had been truncated towards the west by the construction cut for a later brick culvert and to the east it extended beyond the limits of the trench, leaving only



Fig 9. Middle Saxon pits and palaeochannel in Trench 44, looking north

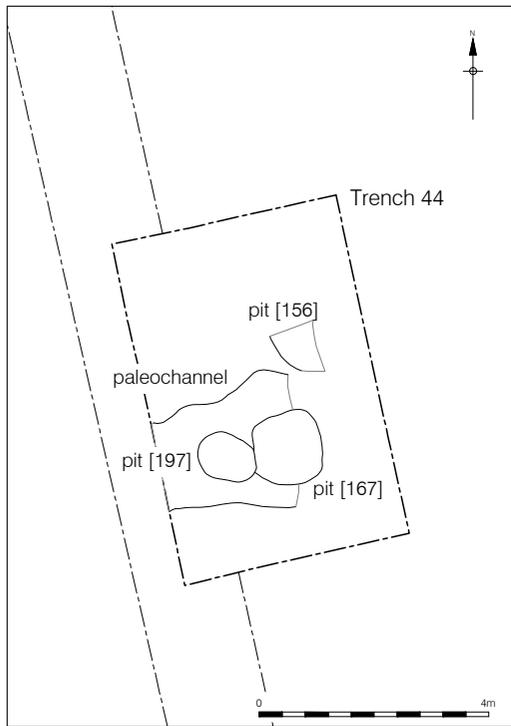


Fig 10. Plan of Saxon features in Trench 44

a visible segment measuring 2.68m in length. Both the northern and southern edges were seen within the excavated area giving the channel a width of 1.54m and a depth of 0.77m. The steeply sloping sides of the channel merged into a slightly concave base, which sloped eastward towards the river. At its highest point the channel survived to a height of 2.15m OD. This level is similar to the Old Treasury Building site where the Middle Saxon deposits were encountered between 0.4m and 1.7m OD (Cowie & Blackmore 2008, 91). In places the sides of the channel appeared to have been stepped, although this may simply mark the main active channel of the palaeostream. The fill of the palaeochannel yielded a single shoulder sherd of a fluted jar in a medium sand-tempered, dark grey ware, dated AD 600–850, and a small fragment of aquamarine glass with an optically blown rib.

To the east the palaeochannel had been partially truncated by three probable rubbish pits, one of which had in turn been heavily truncated by a later intrusion. These

pits had steeply sloping sides which merged into concave bases; they were all filled with identical deposits of coarse mid-bluish grey silty sand with occasional gravel pockets. The larger of the two complete pits measured 0.84m in diameter by 0.43m in depth.

A single body sherd of Ipswich ware was recovered from one of the pits dating it to AD 730–850, while the fill of another yielded a glass vessel fragment which had a marvered, self-coloured reticella trail with white strands (see Jarrett below). These had been applied to the vessel as two back to back loops. Two of the pits yielded a total of 200 animal bone fragments, an assemblage that was dominated by sheep or sheep-sized bones, although pig, cattle and chicken bones were also present (see Rielly below). In addition to this, a few fragments of residual Roman building material were recovered from the fill of the pits. These comprised a piece of *opus signinum*, a Roman brick fragment and a fragment of fine laminated sandstone possibly used for roofing (see Hayward below; Hayward 2011, 170). One of the pits yielded ten human skull fragments, presumably from a single skull of an adult individual. These fragments comprised part of the left and right parietals and occipital. Unfortunately, due to a lack of diagnostic elements precise ageing and sexing was not possible (Langthorne 2011, 156). Environmental sampling of the Middle Saxon deposits revealed charred remains of a number of plants including common hazel (*Corylus avellana*), hazel/alder (*Corylus/Alnus* sp.), oak (*Quercus* sp.), and ash (*Fraxinus excelsior*) (Hégarat & Allott 2011, 175–6).

Middle Saxon pottery

Chris Jarrett

Only three sherds of Middle Saxon pottery were recovered from the site, all from Trench 44. A shoulder sherd of a fluted jar in a medium sand-tempered, dark greyware (SSANB) (LAARC 2007), dated AD 600–850 and believed to be from a Surrey source (Blackmore 2003, 235), was recovered from a fill of the palaeochannel. This form, sometimes described as having ‘melon-ribbing’, is a survival of the Early Saxon potting tradition, surviving into the 8th century. This form has been found in *Lundenwic* in sand-

tempered wares, while a chaff-tempered ware version was found at Drury Lane and thought to be a funerary vessel (Blackmore 2003, 235, fig 89, <P95>, <P97>; Blackmore 1988, fig 27, no. 46; Blackmore 1989, fig 31, no. 43). A body sherd of (intermediate) Ipswich ware (IPSM), dated AD 730–850 (Blackmore 2008a, 181), was noted in pit [167], while pit [197] produced a simple, everted rim of a shell-tempered ware jar dated AD 770–850 (MSSE: Blackmore 1988, 88). Trench 44 is situated a little to the north of the Old Treasury excavations where a Middle Saxon annexed hall was excavated and deemed to be high status, if not royal. Ipswich ware was the main pottery type there, while shell-tempered wares were relatively common. The site was abandoned during the mid-9th century AD and the area was not reused again until the 12th century (Green & Cowie 2008).

Roman building material and stonework

Kevin Hayward

Less than 1kg of dumped Roman building material was recovered from Saxon pit fills [166] and [196] from Trench 44. The same type of pink Roman concrete, *opus signinum*, was also present in both features indicative of a common source for the *spolia*. This material is likely to be of 2nd- or 3rd-century date as the brick fragments are made from the Roman sandy fabric 2459c (AD 140–250) characterised by straw mould at its base.¹ A roof tile made from a fine laminated Wealden sandstone is probably of late Roman date (Boon 1974, 203). This material may have been derived from the western side of Whitehall where Roman activity has been identified; this was also the site of the Middle Saxon riverside settlement on the southern edge of *Lundenwic* (Green & Thurley 1987, 59). Alternatively it may have been recycled from the extensive Roman dumps 0.5km to the south of Whitehall, which were used to consolidate/reclaim land on Thorney Island (Hayward in prep).

Middle Saxon glass

Chris Jarrett

Two small sherds of aqua-coloured Middle Saxon glass were recovered from Trench

44. Found in sample <6>, fill [300] of the palaeochannel [301], was a small fragment with an optically blown rib. It is not certain what form this shard was derived from.

Recovered from an environmental sample <197>, from pit [196], was a vessel fragment with a marvered (trails of glass or other decoration are flattened into the glass gather or expanded blown gather (paraison) and rolled on a polished metal or stone table, before further inflating the vessel), self-coloured reticella trail with white strands, applied to the vessel as two back to back loops. Glass vessels with reticella decoration (a strip of glass containing rod/s of different coloured glass usually applied to the external surface of a vessel) have been found in *Lundenwic*, sometimes with yellow reticella: on bowls at Maiden Lane (Evison 1988) and the Peabody and National Gallery (Evison 1989) sites as well as on funnel beakers at the Royal Opera House site (Stiff 2003). The two sherds of Middle Saxon glass are almost certainly derived from activity associated with the high status Old Treasury Building site (Green & Cowie 2008). The latter site produced only two fragments of clear vessel glass (Blackmore 2008b, 199–200, <S73> and <S74>).

The Saxon animal and fish bones

Kevin Rielly

Introduction

The two Middle Saxon pits in Trench 44 produced a total of 200 fragments of animal bone with 33 (16.5%) identifiable to species or species group (Table 1). All of the bones were moderately well preserved and those from the samples highly fragmented. The fish bones were identified by Philip Armitage.

Methodology

The sample collections were washed through a modified Siraf tank using a 1mm mesh and the subsequent residues were air dried and sorted. The collections recovered by hand as well as by sieving were well preserved and minimally fragmented. However, refitting was carried out where required, the refitted bones counted as one fragment. Each bone or refitted fragment (excluding the fish bones, see below) was then recorded onto

an animal bone database using Microsoft Access. This database is divided into various headings, as follows: species, skeletal part, fragmentation (the proportion of the skeletal part represented), sex, age (a general age if possible, as well as teeth eruption/wear and epiphyses fusion), size and various modifications such as butchery, burning, gnawing, preservation (as noted above), working and pathology. Species could not be assigned to all the bones in these collections. This unidentifiable portion was recorded according to size class, generally to cattle- and sheep-size; these included ribs, fragments of long bone shaft and the majority of the vertebrae. Tooth eruption/wear recording uses the method devised by Grant (1982), while the measurements are essentially taken from von den Driesch (1976). Measurable bones essentially include the majority that can be classed as deriving from an adult individual. This includes complete limb bones, mandibles where the adult third molar

is in wear and various limb bones with fused intermediate and/or late epiphyses *eg* distal tibia and proximal femur respectively. The approximate ages given in the text are taken from the tooth eruption and epiphyses fusion sequences given in Schmid (1972, 75, 77).

Description of the bones

The sieved collections from the Middle Saxon pits provided a relatively wide array of species (Table 1), with the usual major domesticates, cattle, sheep/goat and pig, accompanied by minor quantities of poultry, fish and amphibian. The cattle component is entirely composed of head and foot parts, where pit [167] produced six fragments of skull which could conceivably belong to the same individual, as well as a mandible, metapodial and phalange; while pit [197] provided a phalange. The [197] phalange and the metapodial were clearly from sub-adult individuals, possibly in their 2nd year, and with no evidence to the contrary, all of these parts may well derive from the same sub-adult animal or, allowing for one animal per feature, two sub-adult cattle. This is clearly a rather small collection but the limited range of parts may be significant. There was a greater mix of sheep/goat skeletal parts and ages, suggesting the presence of a juvenile (1st year), a sub-adult (2nd year), and an adult (3rd year or older) individual. In contrast, the few pig bones, again a mix of parts, may have all belonged to one sub-adult animal (2nd year). Butchery was limited to a small knife mark on the shaft of a sheep/goat femur, no doubt related to defleshing. The single identified chicken bone is a tibia from an adult bird, which either represents a hen outside the laying season or a male, as shown by the absence of the medullary bone (after Driver 1982).

The fish bones include freshwater (eel and roach) and estuarine species (herring, plaice/flounder and small gadid, possibly pollack). It was possible to estimate the length of the roach, based on a pharyngeal length of 12.12mm. Using the regression formula of Libois *et al* (1988), this length translates as an estimated total length of 17.9cm. This fits within the size range of adult roaches, between 15 and 25cm, mentioned by Newdick (1979, 70).

Table 1. Species abundance from sieved collections retrieved from two Middle Saxon pits (Total fragment counts)

Pit:	[167]	[197]
Pit fills:	[166]	[196]
Species		
Cattle	8	2
Cattle-size	58	1
Sheep/Goat	3	4
Pig	3	2
Sheep-size	49	58
Chicken		1
Chicken-size		1
Freshwater eel	2	
Herring	1	
Roach		1
Small gadid (cod family)	1	
Plaice/Flounder	3	
Common Frog	2	
Total	130	70

Conclusions

The quantities of bones are possibly too small to warrant a detailed discussion, but nonetheless there is some interest concerning the date of this collection alongside the relative dearth of similarly dated assemblages in this part of London, *ie* somewhat to the west and south of *Lundenwic*. A notable assemblage was found nearby at the Old Treasury Building (Cowie & Blackmore 2008, 96–9) and it is conceivable that these two sites offer contemporary evidence associated with the same settlement. The Treasury produced a much larger faunal assemblage with approximately equal proportions of cattle and sheep, less pig and then some equid, deer (fallow and roe), dog and bird. The bird bones were not identified and in the absence of sieving there is no evidence concerning the exploitation of fish. A major aspect of both the cattle and sheep/goat components was the notable abundance of head and foot parts. This evidence was interpreted in terms of the possible high status of this site and its likely association with the redistribution of food rents (Cowie & Blackmore 2008, 100). The rather slight but corroborative information from the streetscape improvement site may help to reinforce this interpretation. Alternatively, however, these deposits may simply represent butchery waste produced by a local individual.

There are general similarities concerning the collection from this site and those from the numerous excavations within *Lundenwic*, both in terms of species exploited and the recovery of butchers' waste. This is shown for example in the assemblage from the Royal Opera House (Rielly 2003, 319) and also in the synthesis of data from various *Lundenwic* sites (Cowie *et al* 2012, 142–3, 149–52). A large proportion of these excavations provided fishbones, generally with a predominance of freshwater eel, herring and cyprinids (carp family). Plaice/flounder and various gadids form a notable but smaller component. Capture of these species would have involved rod and line, nets or traps. Of some interest, particularly concerning the capture of flatfish, is the discovery of a number of V-shaped tidal fish-traps along the Thames between Isleworth (Kew Gardens) and Chelsea (Battersea Bridge), apparently

of either Early or Middle Saxon date (Cowie & Blackmore 2008, 115–24).

Phase 2: Saxon discussion

Paw Jorgensen and Jonathan Butler

Evidence of Saxon activity was seen only in Trench 44 directly to the west of Horse Guards Avenue. The reason for the discovery of Saxon material here can be explained by the fact that this particular trench was excavated to a greater depth than the vast majority. Therefore, it is likely that further Middle Saxon deposits survive on the site beneath the bases of the other excavated trenches. Three sherds of Ipswich ware, dated AD 730–850/70, and a sherd of North French grey ware, dated AD 600–800, were also found residually in trenches to the south. The Middle Saxon pitting and palaeochannel lay *c.*85m to the north of the Middle Saxon remains found at the Old Treasury Building in the 1960s. It has been suggested that late 8th- or 9th-century buildings found at the Old Treasury site included a high status or perhaps royal hall. This hall would have occupied a key position midway between *Lundenwic* and a Middle Saxon monastery/minster which is postulated to lie on Thorney Island to the south (Green & Cowie 2008, 100; Thomas *et al* 2006, 41). It is probable that the pitting and residual finds found during the streetscape improvements were part of this settlement; it is also possible that the pitting represents the remains of occupation flanking the road from *Lundenwic* to the high status hall.

Although the Middle Saxon pottery assemblage recovered from the site was small consisting of only seven sherds (four of which were residual), it is consistent with late 8th- or 9th-century occupation as seen at the Old Treasury Building. The animal bone assemblage, which included cattle bones that were entirely composed of head and foot parts is similar to that of the Old Treasury Building which contained a high proportion of waste bones from cattle. It has been suggested that such a bone assemblage would have been consistent with a site where food rents were paid and redistributed — a function of a royal hall (Green & Cowie 2008, 100). The Old Treasury Building site

had previously been postulated to have been a farm providing carcasses for the *Lundenwic* settlement (Cowie & Whytehead 1989, 714) and the high proportion of sheep bone from the present site may also be suggestive of a farm, as proposed for other sites with a preponderance of sheep such as the National Portrait Gallery site which lies *c.*500m to the north (Armitage 2004, 110–11). The two fragments of glass, including one with reticella decoration, are suggestive of high status finds and may have come from the possible high status settlement to the south.

The area with the Middle Saxon pitting was apparently abandoned in the 9th century AD with no further activity recorded until the 12th century. This evidence is consistent with that recorded from the Old Treasury Building and the National Gallery Extension, both of which were abandoned during the 9th century and not reoccupied until the 12th century (Green & Cowie 2008, 100; Whytehead & Cowie 1989, 70). This abandonment was most likely in response to the increased frequency of Viking raids, but may also have been due to rising river levels which made the area unsuitable for occupation.

PHASE 3: MEDIEVAL (*c.*1100–1500)

The Middle Saxon channel in Trench 44 was truncated to the south by two intercutting pits (Fig 11). It is possible that the earlier of these was part of the Saxon sequence of pits as it was similar in size and appearance to the earlier features, but as it was devoid of finds this suggestion cannot be confirmed. The eastern side of this pit was cut by a slightly larger, sub-rectangular pit, which contained a fragment of a coarse London-type ware jug dated 1080–1200 (see Jarrett below). The fill of this pit differed from the earlier ones in both colour and texture. While the earlier pits contained bluish grey silty sands, the fill of this pit was composed of a dark brown to dark grey silty clay.

In Trench 53, at the junction of Horse Guards Avenue and Whitehall Court a small section of stone wall was uncovered (Figs 2, 12–13). This was constructed of rough square hewn ragstone blocks laid in regular courses. On average the blocks measured 230 by 220 by 112mm although some were as long as 440mm. These were set in pale

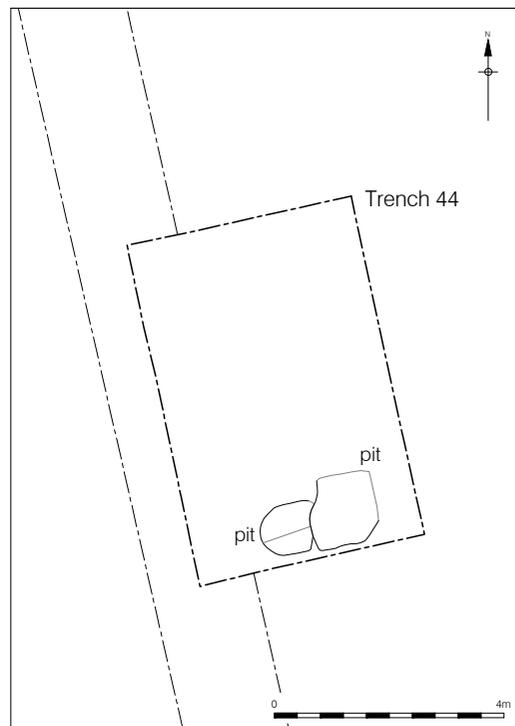


Fig 11. Plan of medieval features in Trench 44

yellow, coarse, very sandy lime mortar.² The masonry measured 0.53m in width and extended both east and west beyond the confines of the trench. On the south side, approximately 0.48m below the top of the wall, a rectangular offset stepped away from the wall, presumably to form the base of a buttress. This offset was stepped back to the south by approximately 0.5m and measured at least 1.05m in length (east–west).

A north–south-aligned brick wall was keyed into the north side of the stone wall. The red Tudor bricks used in the construction were quite irregular in shape and varied in size from 225 by 102 by 50mm to 210 by 100 by 50mm. These were laid in regular courses and bonded with pale yellow moderately coarse sandy lime mortar. The inserted brick wall formed the back of a fireplace or oven. Bricks identical to those used in the construction of the inserted wall were used to lay the base. These were laid in a pattern of concentric half circles radiating towards the corner formed by the two walls. Unfortunately the oven/fireplace was only

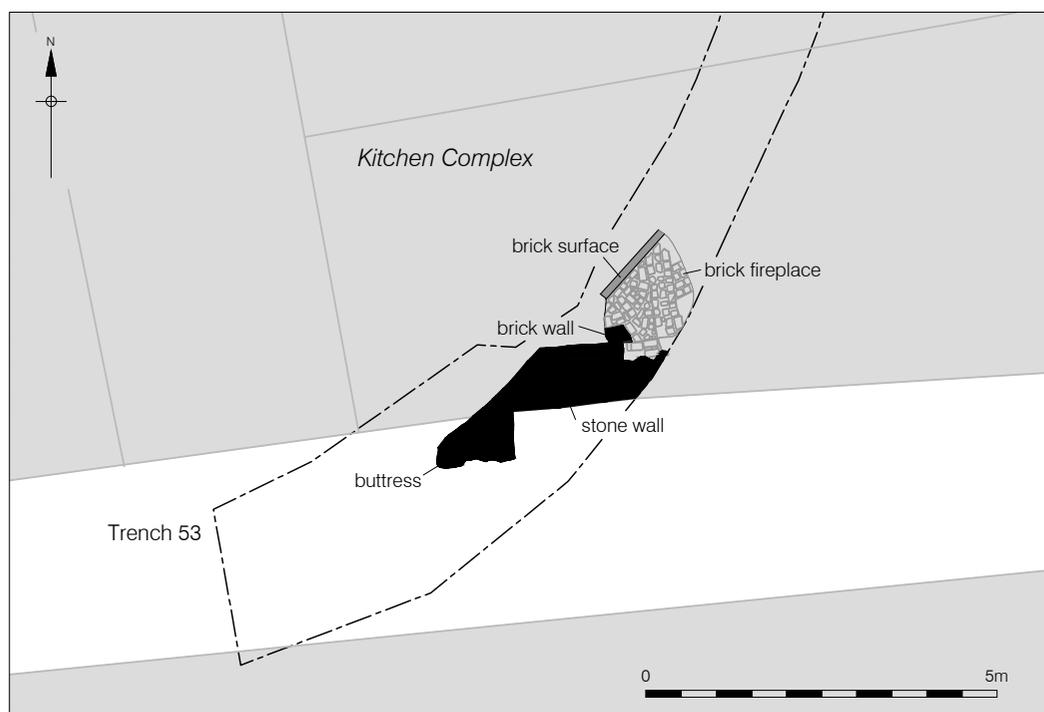


Fig 12. Plan showing the archaeological remains of the Kitchen complex in Trench 53

partially exposed as it was located below the formation level of the trench. Overlying the brick base was a thin lens of charcoal.

Kitchen complex

It is likely that this stone wall formed a part of the south wall of the Kitchen complex and it is probable that it was part of York Place before it was taken over by Whitehall Palace (discussed earlier). The 1670 Fisher survey of Whitehall Palace clearly shows the palace kitchen and associated buildings located at the east end of the great court and just north of the great hall (Fig 5). On this plan the kitchen is shown as roughly square with each side measuring approximately 15m and with large fireplaces set into the east and west walls. None of the surviving building accounts from the death of Archbishop Rotherham in 1500 to the survey of 1670 mention the construction of a kitchen, so it is assumed that the kitchen shown on the 1670 survey is that built by Archbishop Rotherham during his tenure at York Place from 1480–1500 (Thurley 1999, 10).

To the south of the kitchen was a block of buildings containing the privy buttery, pantry and the office and cellar of the Cofferer.³ While it is unknown to what extent Archbishop Rotherham developed the wider kitchen complex, it can be assumed that he was responsible for the block containing these offices as when Wolsey rebuilt the Great Hall its size was restricted by the kitchens to the north.

PHASE 4: POST-MEDIEVAL (AFTER 1500)

The Great Hall

Two abutting stone foundations, one aligned east–west and the other north–south, were uncovered to the north of the north entrance of the Ministry of Defence Main Building along the south side of Horse Guards Avenue in Trench 59 (Figs 2a, 14–15). Neither of the two walls were fully exposed as they extended beyond the limits of the trench. The exposed portion of the east–west-aligned wall measured 1.50m in length and



Fig 13. Masonry wall and brick oven in Trench 53, looking south

continued beyond the limits of the trench. Only the south face of the wall was observed as the north face lay beyond the northern limits of the trench. While the total width of the wall could not be determined, the exposed portion measured 1.10m in width and was excavated to a depth of 0.30m. It

had been constructed from predominantly green sandstone blocks around a chalk rubble core. The bonding material consisted of soft light brownish-yellow to pale yellow coarse sandy lime mortar.

To the south this masonry was abutted by a second, north-south-aligned wall found-



Fig 14. Plan showing the archaeological remains of the Great Hall found in Trench 59, overlaid on Fisher's map

ation, though this was constructed exclusively of chalk blocks set in a similar, albeit slightly lighter, lime mortar to the east–west-aligned foundation. This foundation segment measured at least 1.10m north–south by 0.80m east–west and extended beyond the southern and eastern limits of the trench. Towards the south it had been truncated on the east side by a later brick wall. The upper portion of the west side of the wall had been covered with a ≈ 50 mm thick coat of lime render.

While these footings cannot with great certainty be attributed to any particular building, they are located in the vicinity of the east wall of the Great Hall constructed by Wolsey between 1528 and 1529 (discussed

earlier). When partially exposed during excavations ahead of the construction of the Ministry of Defence Main Building in the 1930s, the thickness of the walls of the Great Hall was seen to be approximately 3ft (0.91m). Although not shown on the 1670 plan of the palace, a bay window with internal measurements of 6ft 6in (1.98m) east–west by 10ft (3.05m) north–south protruded from the east wall of the hall towards the chapel royal. The south wall of this was seen during excavations in 1939 (Thurley 1999, 30). It is possible that the two walls uncovered during the current work represent a portion of the north and east walls of the bay window. Wolsey's Great Hall appears to at least



Fig 15. Part of the brick wall between the Great Hall and the Chapel Royal with Taylor House foundations in the background in Trench 59, looking east

roughly follow the outline of an earlier hall, although it extended further to the south than its predecessor.

The east wall of the bay window was abutted by a later east–west-aligned brick wall (Fig 14). This comprised two segments of 16th-century brick wall aligned roughly east–west and separated by a deliberate gap,

presumably an entrance. To the north of the walls, and also occupying the gap between them, was an external brick-paved surface of a slightly later date. At the west end, the later brick wall had been built partially on top of the eastern wall of the bay window of the Great Hall. It is likely that the later brick wall and the paved surface to the north of

it represent a division within the courtyard between the hall and the chapel royal to the east of it (Fig 14).

The Court Gate

At the junction of what is today Whitehall and Horse Guards Avenue a gatehouse used to mark the main landward entrance to York Place. It is first shown on mid-16th century maps (Fig 4) and a number of references to it exist in the historical documents. Evidently a gatehouse already existed in this location as early as the 15th century, although it is commonly referred to as the 'new gate' throughout the 1530s (Cox & Norman 1930, 44). It is possible that the gatehouse had been repaired so extensively during Cardinal Wolsey's tenure that it was effectively seen as a new building. However, it is possible that the old gatehouse was demolished and a new one built in its place. This new gatehouse may have been constructed on the footings of the old one.

Alternatively the 'newe gatehouse' ment-

ioned in the buildings accounts for the years 1531–32 may refer to the Holbein Gate, on which construction had begun in 1531. The same entry mentions bricklayers hired to construct a brick wall along the highway from the new gatehouse towards Charing Cross (TNA E 36/252, 529). This could be adjoining the north-west corner of the Holbein Gate and extend north along the western side of Whitehall rather than, as suggested by Cox and Norman (1930, 44), from the Court Gate along the east side of the highway (Fig 5). This is perhaps more likely as depictions of the interior of the Court Gate show the main passage to consist of a typical 15th-century ribbed stone vault. It is possible that the gatehouse was a product of George Neville's rebuilding of York Place during the third quarter of the 15th century. The structure was often called the Great Gatehouse and by 1560 'the Court Gate' (Thurley 1999, 10–11). It is depicted in a painting of *c.*1760 by Paul Sandby which shows the gatehouse and the Banqueting Hall from the east (Fig 16).



Fig 16. View of the Great Court *c.*1760 by Paul Sandby (Guildhall Library, Corporation of London)

The façade of the building was further altered in 1676 and the crenellated battlements were removed at the same time. It survived until 1765 when it was finally demolished to provide better access to The Court (Thurley 1999, 10–11). However, a new gate was built in its place a few years later. This was sparked by a number of violent robberies plaguing the area. The new gate survived until 1813 (Cox & Norman 1930, 45–6).

During the investigation, the remains, albeit very fragmentary, of the gatehouse were exposed in Trenches 55, 58 and 99 along both the south and north sides of Horse Guards Avenue (Figs 2a, 17–18). The earliest masonry was exposed on the north side of the road and comprised a north-south-aligned ragstone wall, which had been partially robbed out. On the south side the structure uncovered was constructed of Tudor bricks (described earlier). It is likely that the partially robbed stone wall was part of the earlier gatehouse, which was later replaced by one constructed of bricks.

The ragstone footing was constructed using randomly laid chunks of masonry set in a pale yellow coarse sandy mortar and the wall closely followed the edges of the construction cut suggesting that the stones and mortar had been poured into the construction trench. To the north the wall

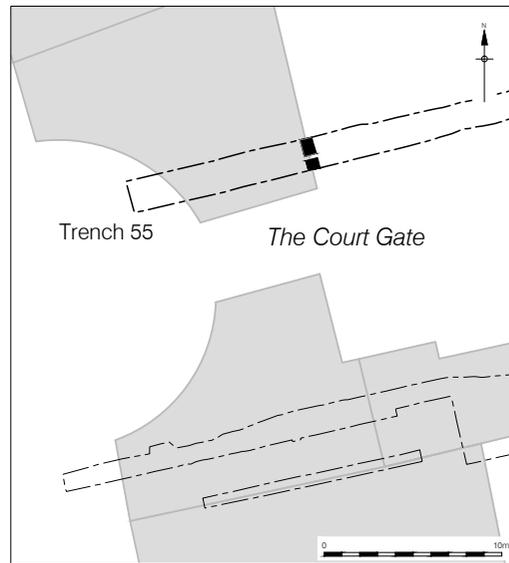


Fig 17. Plan showing the archaeological remains of the north part of Court Gate found in Trench 55 overlaid on Fisher's map

appeared to have been robbed leaving only a residual deposit of mortar, silt and small stone fragments. It is likely that this foundation represented the remains of either the Court Gate or the range of buildings that extended north from it.

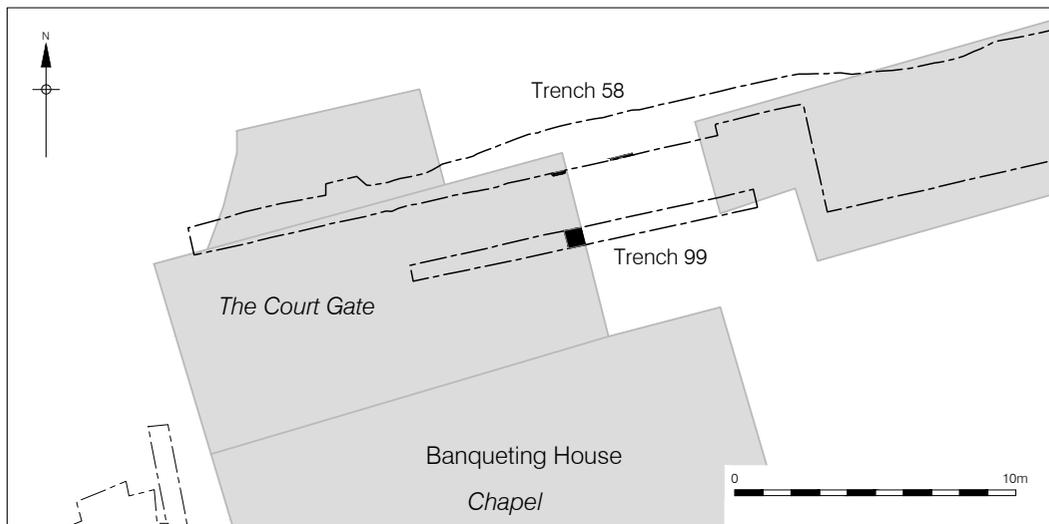


Fig 18. Plan showing the archaeological remains of the south part of the Court Gate found in Trenches 58 and 99 overlaid on Rocque's map

The lodgings and office of the Surveyor of the King's Works

From the early 17th century the buildings in the north-west corner of Middle Scotland Yard were leased to Simon Basil, Surveyor of Works. They remained the lodgings and office of successive Surveyors of Works, including Basil's successor Inigo Jones, although it was not until 1661 that they were officially referred to as the Lodgings of the Surveyor (Gater & Wheeler 1935, 194) (Fig 5). When major repairs were carried out in 1715 the building was found to be in such a ruinous state that it was decided to pull it down and rebuild it on the old foundations. Two years later a warrant was issued authorising the work to be carried out (TNA T 56/18). This building remained until the site was cleared in preparation for the construction of the new office and lodgings of the Surveyor General in 1795. The new building, which later became known as 1–2 Whitehall Place, comprised a four storey brick structure over a basement. During the excavation for the new basement in 1796 two large and ancient sewers were encountered; one disused and the other still active (Gater & Wheeler 1935, 194–5).

During the archaeological investigations remains of both the early 17th-century and late 18th-century buildings were identified and recorded. Unfortunately the later basemented building had destroyed much of the preceding one. Both buildings had been constructed of bricks and within the later building a number of phases of repairs and alterations were observed.

Of the earlier building only two small L-shaped wall segments were exposed towards the western extreme of Trench 62 along the north side of Whitehall Place (Figs 2a, 5 & 19). The one wall, aligned east–west, had been truncated by a later cellar just east of the juncture point. The second wall extended north from the first and continued beyond the northern limits of the trench. Both were 0.60m wide, although the top part of the east wall had been truncated leaving only a 0.15m wide section. The two walls had been constructed of irregular unfrosted red sandy fabric bricks set in fine grained sandy light greyish white lime mortar with very occasional charcoal flecks. These bricks were identical to other 17th-century bricks seen across the site (eg the brick wall adjoining the bay window on the east side of the Great Hall).

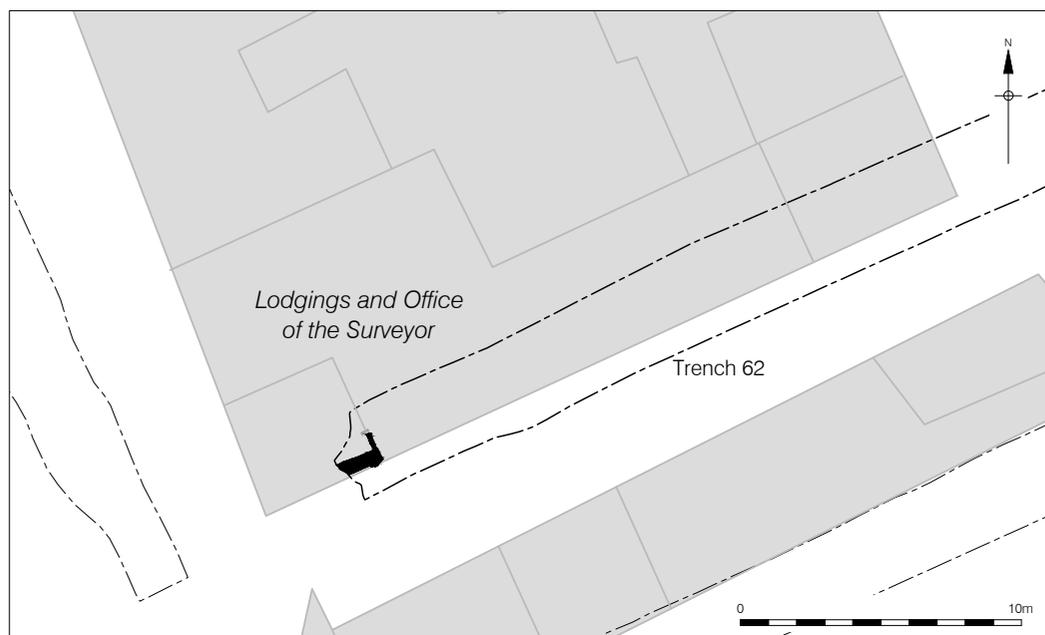


Fig 19. Plan showing the archaeological remains of the Lodgings and Office of the Surveyor found in Trench 62 overlaid on Fisher's map

The remains of the late 18th-century building comprised the footing for the south wall of the house itself and the west and south walls of a basement projecting out from the building towards the street (Figs 8 & 29). All of these walls had been constructed using a mix of shallow frogged red and yellow bricks laid in regular courses and bonded with indurated mid-brownish grey mortar containing occasional flint and charcoal inclusions.

Gun platform

A gun platform was constructed sometime between 1643 and 1660 to defend the approach to both the Holbein Gate and the Court Gate. It is possible that the guns were brought in along with other 'great guns' that were placed in the Great Court and Scotland Yard in the second half of 1659 (Green 1886, 95, 103). While the exact construction date is not known, the building accounts for the years 1660–61 mention a new roof being constructed over the guns at the Banqueting House. In addition to the new roof a munitions depot was also constructed next to the guns at this time. The gun platform is shown in a number of views of the Banqueting House and the Holbein Gate. Of these the earliest is probably the 1669 view of White-

hall from King Street made for Cosimo de' Medici during his visit to London that year (reproduced in Thurley 1999, 120, fig 125). The platform of guns is also shown on the 1670 Fisher survey of the palace (Fig 5).

A number of brick walls possibly representing the remains of the gun platform were observed during the investigation (Figs 2a, 5 & 20). Unfortunately these had been heavily truncated by the installation of later services and were all directly overlain by modern fill. While the location of the walls corresponds to the position of the gun platform, the lack of temporally diagnostic material from the area means that there is a large degree of uncertainty in identifying the walls as those of the gun structure. However, with the exception of the Van Huls house no buildings other than those associated with the gun platform appear in this area in the cartographic evidence. The grounds of the Van Huls house correspond to the location of the earlier Privy Gallery located to the south of the Banqueting House whereas the exposed walls were located to the west of the Banqueting House (Fig 20).

Portions of what were believed to be the north and south walls of the gun platform were uncovered in Trench 52 along the east side of Whitehall directly in front of the Banqueting House. The bricks used in the

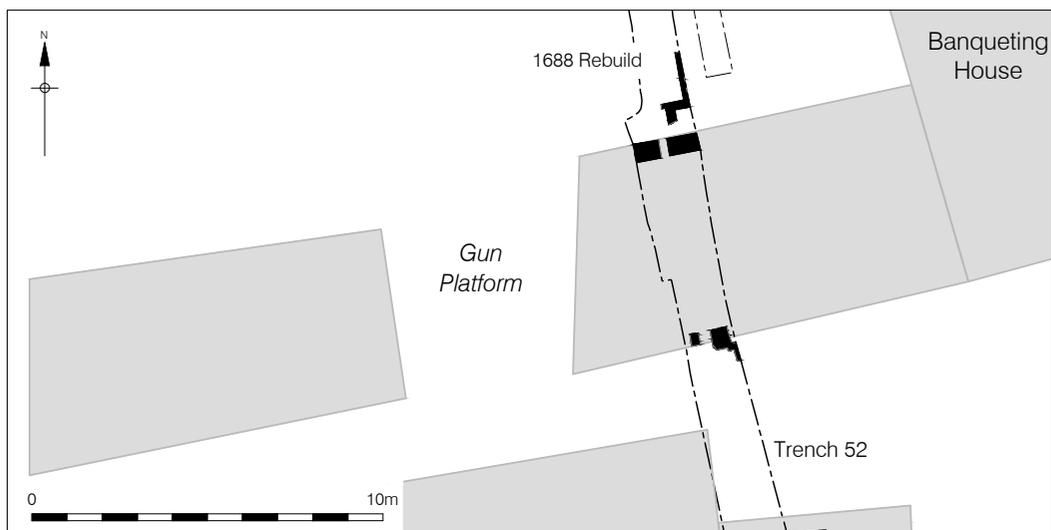


Fig 20. Plan showing the archaeological remains of the gun platform found in Trench 52 overlaid on Fisher's map

construction of the walls were similar in both size and fabric to the handmade earthy sandy red bricks with very small clinker inclusions identified elsewhere on site as being of 17th-century date.

The gun platform was evidently demolished some years prior to 1688 in order to facilitate the rebuilding of the Privy Gallery, which it abutted to the south. Upon completion of this work James II ordered a new gun battery to be constructed to replace the one that had been demolished. Work on building the new battery was carried out in 1688. Additional work was carried out in 1689 when the roof was raised and again in 1699 (TNA WORK 5/43).

Archaeological evidence for the new gun battery constructed by James II was recorded to the north of the earlier gun platform and consisted of the scanty remains of a north-south wall with an east-west return. Like the earlier building this one was constructed of bricks (Fig 20). This new gun battery, or at least the structure itself, survived until 1723 when it was demolished to ease the flow of traffic.

Privy Garden

To the west of Gwydyr House in Trench 52 two parallel east-west-aligned brick walls approximately 1.80m apart were exposed (Figs 2a, 5 & 21). The northern of these was constructed entirely out of brick while the southern contained a mix of bricks and ragstone blocks. Identical bricks and mortar had been used in the construction of both walls. Without exception the bricks used in the construction of these walls consisted of unfrogged handmade bricks of an orange to red fabric. While there was some variation in the size of the bricks the average brick measured 230 by 100 by 70mm. These were set in a very sandy light greyish brown to pale yellow soft lime mortar.

Although no dating evidence was available for the walls themselves, they were sealed by deposits containing 15th- to 16th-century tile and brick fragments indicating that the walls predate this material. No structures are shown on the 1670 survey of the palace in the immediate vicinity of the walls, though it can be estimated that they lie within what was at the time the Privy Garden and it is

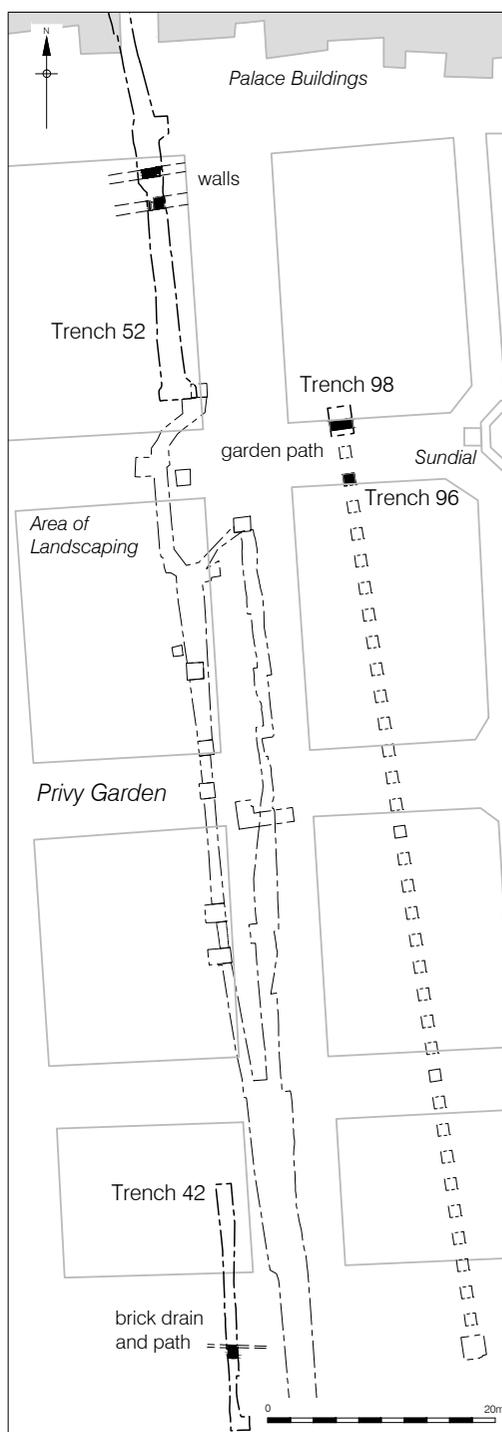


Fig 21. Plan showing the archaeological remains within the Privy Garden walls found within Trenches 42, 52, 96 and 98 overlaid on Fisher's map

possible that they represent small boundary walls (Fig 5).

17th-century paths within the Privy Garden

Towards the southern boundary of the old Privy Garden an east–west-aligned brick-paved pathway was recorded in Trench 42 (Figs 2b & 21). This was abutted to the north by a brick-lined drain. Both features were constructed from handmade red or orange sandy fabric bricks, measuring on average 210 by 108 by 55mm, which were dated 1600–1700. In both the case of the path and the drain the bricks were set in white shelly brick mortar. The path consisted of a 0.60m wide section of stretcher bonded brickwork at least two courses thick. To both the east and west it extended beyond the limits of the trench leaving only a 0.96m long section of the path exposed. The drain abutting it to the north comprised two parallel lines of brickwork spaced 0.10m apart and each one course wide. These were laid in stretcher bond and survived to a height of at least 60mm.

A series of small, 1m square, trial holes was excavated in a line extending from south to north across the lawn to the west of the Ministry of Defence Main Building (Fig 21). Towards the north end of the green two of the trial holes encountered east–west-aligned brick surfaces constructed from similar bricks to those of the path discussed above. These likely represent the remains of the series of paths laid out in the 17th century to subdivide the Privy Garden into sixteen unequal quadrangles — the layout shown on the 1670 plan of the palace (Fig 5).

The Van Huls house

South and west of the Banqueting House part of the ruins of the Van Huls house were uncovered (not illus). These comprised three roughly parallel east–west-aligned wall segments constructed using a mix of red and yellow bricks (dated 1700–1850) laid in English bond and set in coarse soft pinkish yellow lime mortar. The northern and southernmost walls likely formed part of the north and south side of the building respectively, while the narrower wall located between them was likely an interior partition. Immediately south of the house a number of

pits were observed. These yielded very few finds and it is likely that they were associated with the removal of the burnt out ruins of the Privy Gallery prior to the construction of the Van Huls house.

Before the conflagration of 1698 William Van Huls, Clerk of the Queen’s Robes and Wardrobe, had been granted lodgings over the Holbein Gate and certain rooms within the Privy Gallery to the east of it. In 1712 Van Huls requested a lease of the land between the gate and the Banqueting House so that he might rebuild and expand his lodgings as the greater part of his rooms to the east of the gate had been destroyed in the 1698 fire. The request was granted and Van Huls set about building his new house and offices (Cox & Forest 1931, 18–19). Only seven years later Van Huls’ lodgings were once more at risk of destruction. This time not from fire, but by a proposal to widen the road by demolishing the Holbein Gate and the adjoining house and gardens. As has already been stated the gate (and Van Huls’ house) was spared, although the easternmost part of his property was requisitioned in 1723 to allow for traffic to bypass the narrow opening of the gate. Van Huls’ house, along with the Holbein Gate survived until 1759 (Cox & Forest 1931, 18–19).

King Street Gate

While Cardinal Wolsey’s York Place was bounded to the west by King Street, Henry VIII extended its grounds by acquiring the land along the west side of the street. The palace now awkwardly straddled the public thoroughfare from Charing Cross to Westminster. In order to facilitate communication between the two sides without having to interact with the increasingly busy thoroughfare, a gallery was built along the northern edge of the orchard (later the Privy Garden) in the early 1530s linking the eastern and western sides by the means of a gatehouse spanning the road. This new gatehouse became known as the Holbein Gate (Thurley 1999, 43) (Fig 4).

In the 1540s a second gate was constructed further west across King Street linking the southern part of the palace to the park side. The gate is shown on both the Agas map (Fig 4) and the Fisher survey of the palace (Fig 5). In addition to this a view of the gate was produced by Vertue shortly before its

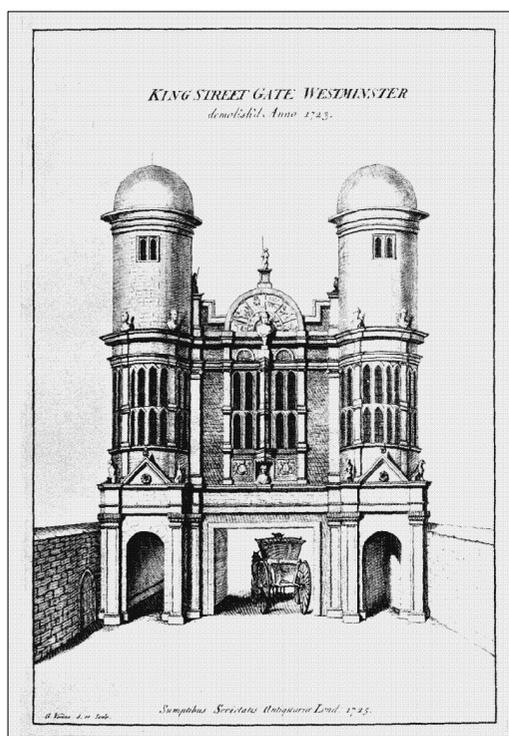


Fig 22. King Street Gate c.1725 by George Vertue

demolition in the 1720s (Fig 22).

The King Street Gate was demolished at the same time as the old privy garden wall in order to widen the road and facilitate the flow of traffic. Evidently the gate and the narrow street beyond had been causing traffic congestion for quite some time prior to the demolition of the gate and widening of the road. This is evidenced by Samuel Pepys in 1660 when his diary entry for November 27 reads: '... From thence to Westminster Hall, and in King Street there being a great stop of coaches, there was a falling out between a drayman and my Lord Chesterfield's coachman, and one of his footmen killed' (Pepys 1660, 1, 273).

Possible evidence for the King Street Gate was encountered in a deep trench located at the north corner of Downing Street and Whitehall. Here two parallel north-south-aligned brick and chalk footings spaced approximately 1.70m apart were revealed in Trench 32 (Figs 2b & 23). The remains had been truncated to the south by a modern manhole inspection chamber, which occup-

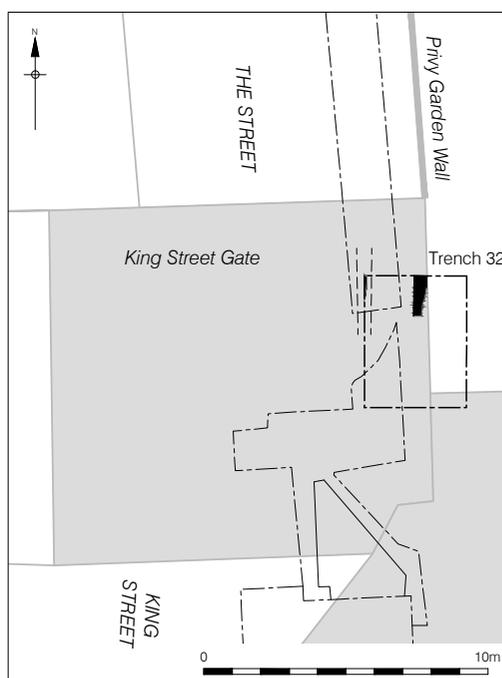


Fig 23. Plan showing the archaeological remains of the King Street Gate found within Trench 32 overlaid on Fisher's map

ied the majority of the trench. Thus the archaeological remains of the gate were mostly seen in the sections of the trench. Both the footings had been constructed on the natural gravels. At the top of the easternmost footing was a brick offset, presumably meant to support a timber floor between the two walls, but unfortunately the westernmost footing had been truncated to the height of the offset. The bricks used in the construction of the walls were handmade, of a red fabric, and varied in size from 220 by 100 by 50mm to 216 by 110 by 50mm set in a light brown lime mortar containing a moderate frequency of small chalk fragments. Considering the size and fabric of the bricks as well as the mortar type, it seems likely that the footings date to the 16th century.

Realigned Privy Garden wall

By the early 1720s congestion caused by the bottleneck created by the narrow passage through both the Holbein Gate and the King Street Gate caused significant inconvenience

to traffic. In 1723 a proposal was made to demolish the Holbein Gate (TNA WORK 6/7). The proposal was rejected, partially on the grounds that the gate was seen by many to be one of the greatest curiosities in the city. While the Holbein Gate was saved from destruction a warrant was issued for the demolition of the King Street Gate at the south end of the Privy Garden (TNA T 54/28). At the same time another warrant was issued for shifting the west wall of the Privy Garden to the east in order to widen the street between the two gates. The new wall was to be constructed using the stones from the old wall and made good with stones from the deconstructed King Street Gate (TNA WORK 4/2). This new boundary wall is depicted on the Rocque Map of 1746 (Fig 6) and on two views of Whitehall from the south by Canaletto in 1746 and 1749 (reproduced in Phillips 1964, pl 1, fig 32).

While no evidence of the old Privy Garden boundary wall was seen during the archaeological investigations various portions of the foundations of the new 1723 Privy Garden wall were encountered in Trench 36 to the west of the Ministry of Defence Main Building (Figs 2a, 2b & 24). The foundations of this wall were constructed from a medley of reused building materials in accordance with the documentary evidence. Although it cannot be said for certain that this material was recovered from the old wall and the King Street Gate, it seems likely that this was indeed the case.

Materials used in the construction of the new wall foundation included fragments of Purbeck Limestone paving slabs and reused blocks of Kentish ragstone, Taynton stone, Combe Down Oolite, fine yellow micaceous sandstone, Portland stone and Reigate stone (see Hayward below). This masonry was bonded by a soft white-grey mortar with moderate clinker inclusions, although in a few areas where repairs or alterations to the foundation had been carried out the bonding material consisted of shelly brick mortar. The wall supported by this foundation was constructed of poorly made unfrogged post-Great Fire purple clinker bricks measuring between 220 by 110 by 60mm and 225 by 98 by 70mm, bonded by a grey shelly, clinker lime mortar. While the full width of the new Privy Garden wall was

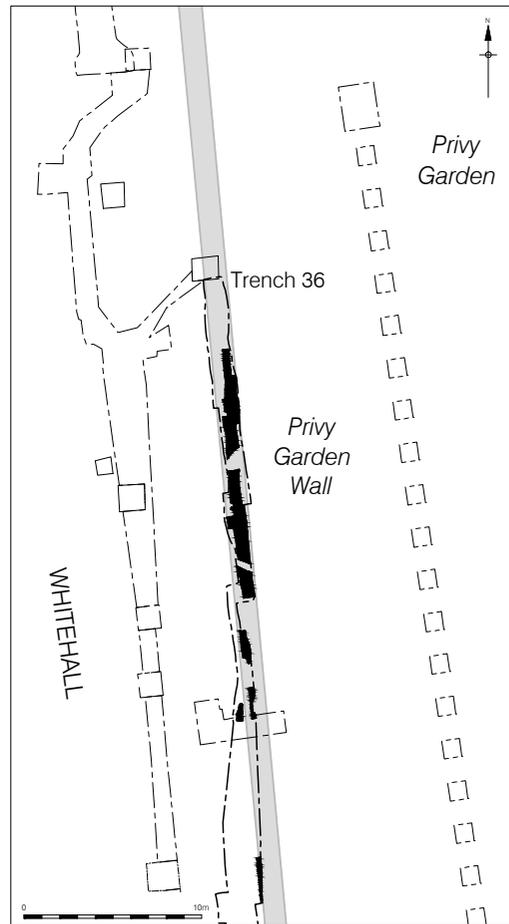


Fig 24. Plan showing the archaeological remains of the 18th-century Privy Garden wall found within Trench 36 overlaid on Rocque's map

not exposed, observed sections of it would suggest that the foundation plinth must have been at least 0.40m wide while the brick superstructure must have been at least 0.30m wide. The style of the bricks and the type of mortar used date the construction of the wall to between 1664 and 1850.

Taylor House

In 1718 Robert Darcy, 3rd Earl of Holderness, was granted a lease of a plot of wasteland along the river and just south of Whitehall Stairs (Fig 7). The lease describes the parcel of land as part of the ruins of Whitehall Palace and states that it was almost entirely

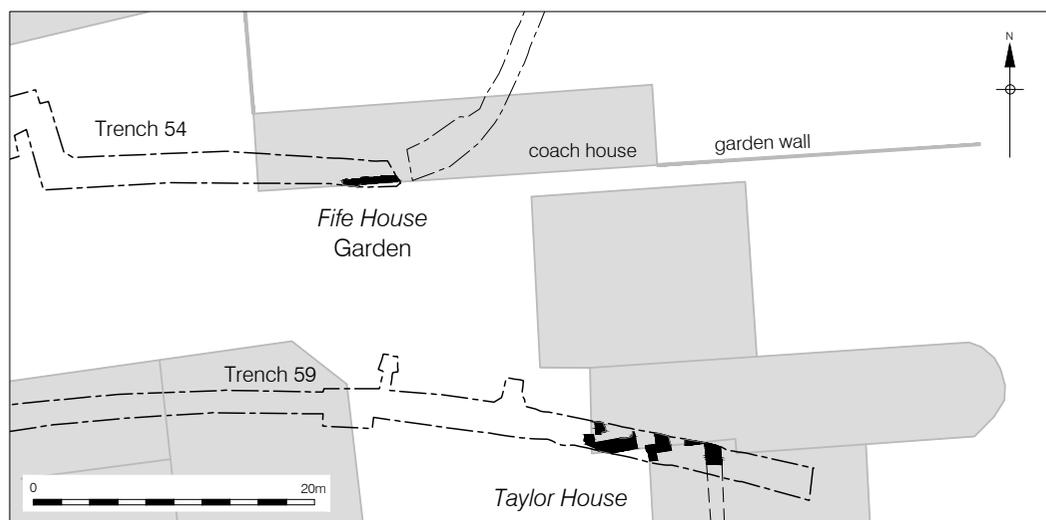


Fig 25. Plan showing the archaeological remains of Taylor House and the Fife House garden wall found within Trenches 54 and 59 overlaid on Horwood's map

covered with heaps of rubbish (Cox & Norman 1930, 152). More specifically the ruins within the land granted to Darcy were probably those of the Chapel Royal to the east of the Great Hall. In 1793 the property was sold to Michael Angelo Taylor and at that time described as being in 'so decayed a state as to be scarcely habitable' (TNA T 55/25, 64). Over the next ten years the property underwent extensive renovation work during which the northern wall was entirely rebuilt in a more substantial manner and the other parts were stripped to the walls. The building remained in existence until at least the early 1920s. Just prior to its demolition the building was described as comprising a 'semi-basement with three stories over, and an attic in a slated mansard roof to the main portion' (Cox & Norman 1930, 153). Photographs taken of the exterior of the building show portions of earlier stone walls incorporated into the fabric of the new brick building.

The foundations of parts of the north wall and of an interior wall of Taylor House were uncovered in Trench 59 located along Horse Guards Avenue outside the north entrance to the Ministry of Defence Main Building (Figs 2a & 25). The foundations for the north wall had been constructed almost entirely out of reused materials and incorporated both fragmented bricks and

stone blocks. Later alterations and repairs to this wall had been carried out in brick. While the north wall was constructed primarily of unfrogged red bricks, blocks of green Reigate stone, Portland stone and occasional Purbeck marble fragments helped make up the core of the wall. These materials were bonded with pale yellow, coarse, moderately soft, sand rich lime mortar. The latest materials observed within the exposed wall suggest a construction date during the early 18th century. The wall itself was faced with header bonded unfrogged red bricks. It had been subject to refacing and the east end had been rebuilt in the late 18th century and later refaced. The same type of bricks had been used in the construction of the interior wall, although these were resting on an earlier, much wider stone footing.

Fife House Gardens

Following the fire of 1698 Edmund Dunch acquired a plot of land formerly occupied by the Queen's Bakehouse and the southern part of the Small Beer Buttery. Later leases included what was described as a plot of waste ground to the south of his lodgings and extending along the river to Whitehall Stairs. The waste ground extended across much of the kitchen complex, including the former

palace kitchens, part of the pastry office, parts of the privy buttery, the cofferer's office and cellar, the ewery office, *etc* (Gater & Wheeler 1935, 165). Following Edmund's death in 1719 his widow, Elizabeth Dunch, added to the property the former dwelling of the Clerk of the Pastry adjoining the Pastry Yard to the west (TNA E 367/6784). The fact that both the leases granted to Edmund and later Elizabeth include plots of waste land suggests that much of the kitchen complex was destroyed during the 1698 fire, although it does seem that at least parts of the Queen's Bakehouse and the Small Beer Buttery survived. After Elizabeth Dunch's death in 1761 the property was for a short time owned by her daughter, who in 1762 sold it to Joshua Steel. Joshua started the enclosure of the foreshore to extend his garden eastward. This work was however stopped by the Board of Works in 1762 as it was believed that his encroachment on the river would reduce access to Whitehall Stairs (TNA WORK 6/18, 24). The following year the property was sold to the Earl of Fife, who procured permission to continue the enclosure of the foreshore (TNA WORK 6/18, 48) (Fig 7).

A portion of the south wall of the Fife House gardens was uncovered during the investigation (Figs 2a & 25). This was located in Trench 54 along the north side of Horse Guards Avenue, near its intersection with Whitehall Court. The remains comprised the lower two courses of a roughly east-west-aligned wall standing one course wide. It was constructed out of ashlar blocks of Kentish ragstone.

On John Rocque's map of 1746 the southern portion of Elizabeth Dunch's property was laid out as a garden or orchard enclosed by a wall (Fig 6). The portion of wall extending along the southern boundary of the property also defined the north side of the narrow public thoroughfare leading to Whitehall Stairs. As can be seen from Richard Horwood's 1792–99 map, a coach house was later built in the south-west corner of this property (Figs 7 & 25). It is uncertain how this coach house was constructed; whether it was built onto the existing wall, or if the garden wall was demolished and then rebuilt to include the coach house. The remains of the wall uncovered by the current investigation was comprised, as already stated, of a length

of ashlar walling only one course wide and it did not survive to great depth. It is therefore probable that it represents the remains of the garden wall rather than a more substantial structure. However, it is possible that the later coach house shown on Horwood's map was a simple lean-to type structure which incorporated the south and west walls of the garden into its construction.

Carrington House

Many of the buildings along the north side of Whitehall Court (now part of Horse Guards Avenue) appear to have survived the fire of 1698 relatively unharmed, or were at least habitable after the conflagration. Throughout the existence of the palace these buildings had functioned as offices for the various administrative departments including the privy seal office, the jewel office *etc*. During the early part of the 18th century private leases were gradually granted for these premises and the spaces transitioned into residential use (Gater & Wheeler 1935, 173).

One such lease, for properties joining onto the north-west corner of Whitehall Court, was granted to Lord Newburgh in 1721. Over the next several decades Lord Newburgh, and later his son the Hon James Cholmondeley, proceeded to acquire the leases for the surrounding properties. In 1763 the leases were sold on to Earl Gower who consolidated the leases for the individual properties into a single lease. In 1765 the property was cleared in preparation for the construction of what would become known as Carrington House, designed by Sir William Chambers (Fig 7). The clearing of the site in preparation for the construction of Carrington House in 1765 also coincides with the date of demolition of the Court Gate directly to the south. In addition to providing better access to the court, it is possible that the purpose of the demolition of the gate was simply to make room for Carrington House. Following the death of Earl Gower (then Marquess of Stratford) in 1803 the property was sold to Lord Carrington. It remained in his possession until the expiration of the lease in 1850 and he continued to reside there for some years after the expiration of the lease. The building was demolished, along with several others along Whitehall, in 1886 in

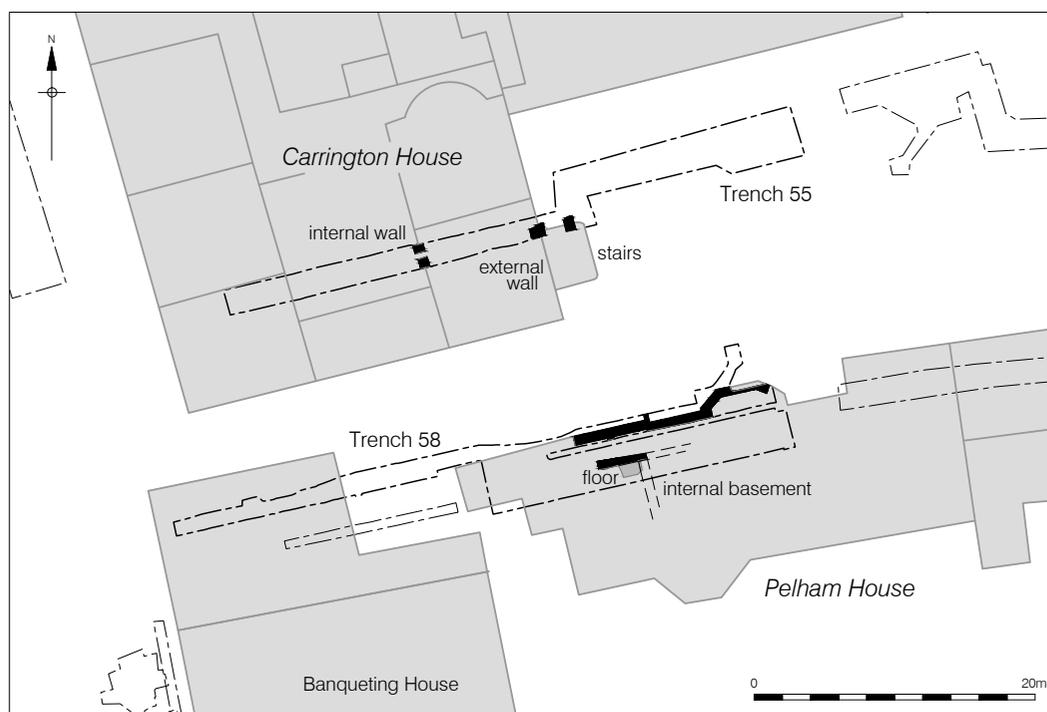


Fig 26. Plan showing the archaeological remains of Pelham House and Carrington House found within Trenches 55 and 58 overlaid on Horwood's map

preparation for the construction of the War Office Building, which now occupies this part of the site (Gater & Wheeler 1935, 174–7).

Near the west end of Trench 55 excavated along the north side of Horse Guards Avenue three parallel north–south-aligned brick footings were recorded (Figs 2a, 7 & 26). Their locations overlaid onto Horwood's map of 1792–9 reveal that the middle footing coincides with the eastern wall of the Carrington House. A ground plan produced prior to the building's demolition in 1886 further reveals that the location of the westernmost footing corresponds to the west wall of the entrance hall and the eastern footing to that of the stairs leading to the main entrance from the court (now Horse Guards Avenue).

All of these walls were constructed from unfrogged red bricks measuring 230 by 105 by 60mm, bonded by hard very light grey lime mortar. Unfortunately not enough of the walls were exposed that coursing could be determined. All three footings measured between 0.70m and 0.78m in width. Between

the two westernmost walls were the remains of an earlier cobble surface. No dating evidence was recovered from this surface so it is impossible to accurately date it, though it can be said to predate Carrington House as the footing for this building had truncated the cobble surface. It is probable that the surface represents the remains of the cobble paving of Whitehall Court (Fig 6).

The New Gallery

From at least the reign of Elizabeth I, a passage or terrace allowed for communication between the Banqueting House site to the west and the Privy Lodgings and Council Chamber to the east. Initially this consisted of little more than a wooden terrace separating Pebble Court from the Great Court. This terrace seems to have remained standing until 1668 when it was replaced by a new covered walk built of brick. In either 1619 or 1620 Sir John Finet recorded that when the Spanish ambassador and his entourage passed over the dilapidated wooden

terrace the floor collapsed, taking with it the Earl of Arundel, Lord Grey and others. The ambassador himself would have fallen through the floor had it not been for his servants grabbing hold of him (Cox & Norman 1930, 61–2). Construction of the new brick gallery between the Banqueting House and the King's Guard Chamber started in July of 1668 and was completed the following year (TNA E 351/3283) (Fig 5). The New Gallery evidently survived the fire of 1698 relatively unscathed and was afterwards taken over by the pages of the Removing Wardrobe and can be seen as two adjoining narrow rectangular buildings on Rocque's map of 1746 (Fig 6). Later the westernmost of these two galleries was incorporated into the northern portion of Pelham House.

Pelham House

Lady Pelham, in 1755, leased a plot of land along the south side of The Court and adjacent to the north side of the Banqueting House (Fig 7). The plot already contained what was at the time described as an old building occupied by the pages of the Removing Wardrobe and containing at the west end the kitchen to the cofferer. In addition to the original plot, which measured 108¾ft in length (east–west) by 21ft in width (north–south), Lady Pelham applied for an extension on the Privy Garden side so that she might widen the building (Cox & Norman 1930, 140). The dimensions of the old building correspond to those of the New Gallery, which had been built in 1669 and appears on the 1670 survey of the palace (Fig 5). It has therefore been suggested that the 'old building' mentioned in Pelham's lease is that of the New Gallery, which must *ipso facto* have survived, at least to some extent, the fire of 1698.

There is a good range of paintings and later photographs depicting the 'old building' and later Pelham House. From these it appears that with the exception of Pelham's addition and some minor changes to the frontage, the building changed little. This, in addition to the fact that the dimensions of the 'old building' are identical to the dimensions of the New Gallery of 1669 suggests that at least portions of this part of the palace survived within the fabric of the Pelham House until its demolition during the 20th century.

A large portion of the north wall and footing of Pelham House was uncovered during the investigation in Trench 58 (Figs 2a, 7 & 26). This was constructed using predominantly red Tudor bricks with occasional red and yellow post-Great Fire bricks used to repair damage to the wall. These later bricks were more frequently used within a polygonal bay window later inserted towards the east end of the wall (Fig 26). The bricks were for the most part laid in header bond and bonded by moderately hard light grey lime mortar. While the analysis of the latest brick fabrics and mortar types suggests a date range of 1750–1850, it is likely that this reflects repairs and alterations carried out after Lady Pelham acquired the property in 1755. The date range given for the latest brick fabrics is 1664–1900 with a refined date based on the mortar of 1750–1850. However, it appears likely that the Tudor bricks in the northern wall of Pelham House represent part of the New Gallery fabric (see above), which was incorporated into the later house.

Part of the basement of Pelham House was also uncovered during the investigation (Fig 26). This was set approximately 1.60m south of the north wall of the house and comprised north–south and east–west walls of uncertain width and a fragment of brick-paved flooring. Both the walls and the flooring were constructed of frogged red bricks (measuring 234 by 94 by 62mm) bonded with light greyish white lime mortar. On stylistic grounds these bricks date to after 1700.

King Street

To further alleviate congestion on the narrow King Street and to improve access to the newly proposed Westminster Bridge an amendment to the Westminster Bridge Act of 1735 granted the Bridge Commissioners permission to acquire the appropriate properties in order to create new access roads and to widen existing ones (Cox 1926, 1). The new layout of the Westminster Bridge approach is shown on Horwood's map (Fig 7).

Several wall segments related to the buildings along the west side of the southern part of Parliament Street were observed during the investigation in Trenches 4, 9, 13, 14, 20, 23 and 28 (Figs 2b, 7, 27 & 28). The archaeological evidence suggests that the

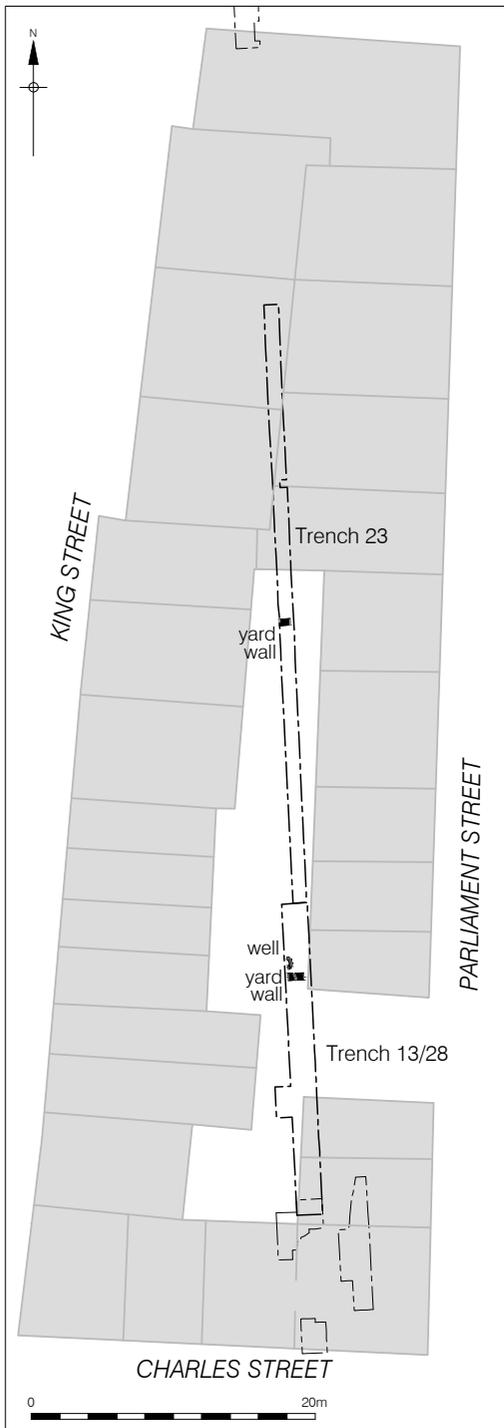


Fig 27. Plan showing the archaeological remains of buildings along the north part of King Street and Parliament Street found within Trenches 13/28 and 23 overlaid on Horwood's map

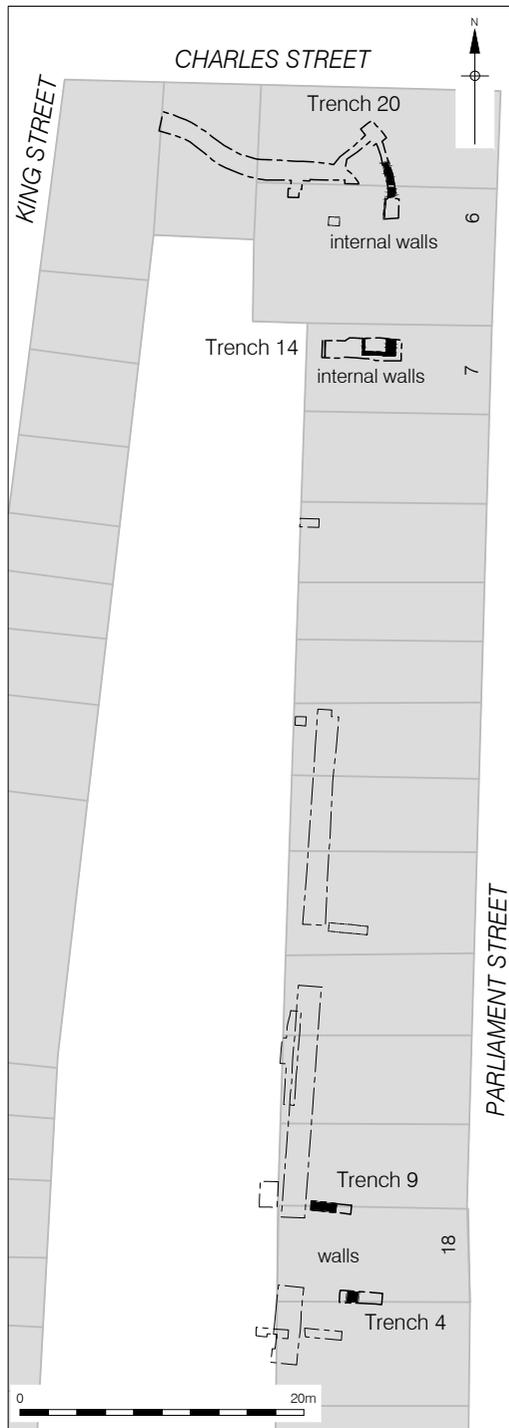


Fig 28. Plan showing the archaeological remains of buildings along the south part of King Street and Parliament Street found within Trenches 4, 9, 14 and 20 overlaid on Horwood's map

terraced buildings of the southern block fronting Parliament Street were basemented and of brick construction (Fig 28). No trace of the buildings comprising the northern block of Parliament Street was recorded, but on the site of their backyards, segments of east–west-aligned brick walls roughly following the projected property boundaries were recorded (Fig 27). These walls were constructed of the same type of bricks as the buildings along the southern part of Parliament Street. By 1875 the buildings between King Street and Parliament Street and to the north of Charles Street had been demolished to make way for the new Colonial Office (Walford 1875, 392–3).

This fits in with the archaeological evidence as repair work to the basement walls was seen to contain bricks dated to 1850–1900 at the latest. However, the later fabrics were observed only within areas of repair. Based on analysis of the bricks and mortar, it would appear that the walls had been constructed some time between 1750 and 1850. There was little or no difference in the brick fabrics and mortar used in the construction of the buildings along Parliament Street to the north and south of Charles Street. This suggests that either these buildings were constructed in a single phase, or within a short period of time.

Near the corner of King Charles Street and Parliament Street the eastern portion of a circular brick-lined well or soakaway was observed in Trench 13/28, with an estimated external diameter of approximately 1.50m (Fig 27). The brick lining consisted of poorly made unfrosted red to purple clinker fabric bricks measuring on average 220 by 95 by 60mm. These were laid one course wide with the headers facing towards the centre of the feature. These bricks probably date to 1750–1850. For bonding material a friable fine grained sandy clay was used rather than actual mortar. Excavation of the backfill of the construction cut for the well yielded sherds of early post-medieval redware (1480–1600) from the London area together with peg tile fragments dated 1600–1800. Taking into consideration the dating evidence recovered from the construction cut backfill as well as the type of bricks, it seems probable that the well or soakaway was constructed some time during the second half of the 18th century.

It is probable that this feature was situated within the backyard of one of the adjoining houses.

Whitehall Place

A plan to build a new terrace of six houses along what is now Whitehall Place was put in place in 1812 (Fig 8). This new terrace was to extend east from the house and office of the Surveyor erected in 1796. The two westernmost plots were acquired and cleared by John Garden, who then set about erecting two new buildings in keeping with the style of the Surveyor General's building to the west. He soon encountered problems obtaining solid foundations as the two plots were evidently situated over a backfilled ancient dock (Gater & Wheeler 1935, 197). The ancient dock that Garden encountered may be the one that Henry VIII ordered built within the grounds known as Scotland adjoining unto York Place. If the dimensions given in the accounts for the dock are correct then it would have measured 25 rods (roughly 125m) in length by 24ft (approximately 7.3m) in width by 9ft (approximately 2.7m) deep (TNA E 36/251–2, 639), long enough to reach Garden's properties. Fisher's 1670 plan of the palace does show a dock to the east of the properties; however it is significantly smaller than that mentioned above (Fig 5). It is certainly unlikely that it would have been close enough to the properties to have been visible during the excavation for the basements. No evidence of Henry's dock was observed during the investigation, although this is not surprising considering the limited depth of the trenches within this area.

Amongst the buildings constructed by Garden was No. 4 Whitehall Place, which in 1829 became the first headquarters of the newly established Metropolitan Police Office. Prior to its removal in 1890 to New Scotland Yard the Metropolitan Police Office occupied Nos 3, 4 and 5 of the terrace along the north side of Whitehall Place (Gater & Wheeler 1935, 200). Portions of the vaulted cellars of these buildings, along with the ones belonging to the neighbouring properties were exposed in Trench 62 during the investigation (Figs 2a & 29). This line of protruding cellars continued along the entire length of Whitehall Place from

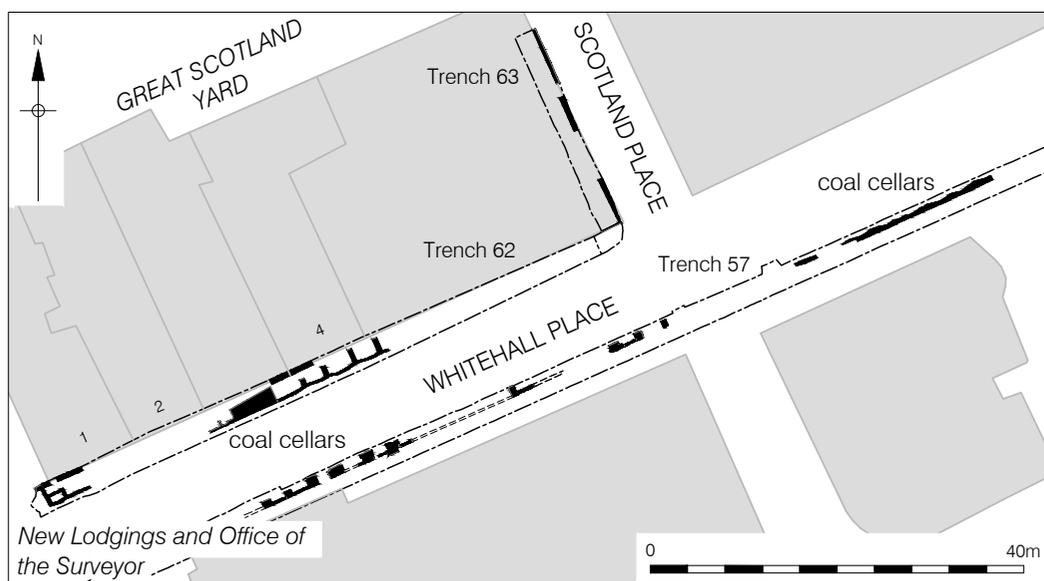


Fig 29. Plan showing the archaeological remains of the new Lodgings and Office of the Surveyor as well as the remains of the buildings along Whitehall Place found within Trenches 57, 62 and 63 overlaid on the 1st Edition Ordnance Survey map

Whitehall in the east to Scotland Place in the west, although the eastern part was seen only in section. The eastern extent of this terrace was recorded along Scotland Place. These walls had been constructed using frogged yellow and red bricks bonded by light brown to light grey lime mortar.

Along the north side of Whitehall Place repairs and alterations were also carried out at Nos 1 and 2 (formerly the lodgings and offices of the Surveyor) (Figs 8 & 29). This included the infilling of a doorway into the basement. This was done using frogged yellow bricks bonded by light greyish brown lime mortar.

Additional basements were uncovered on the south side of Whitehall Place in Trench 57 (Fig 29). Like the ones on the north side these belonged to the late 18th/early 19th-century terrace built along the south side of Whitehall Place. On this side of the road the terrace survived until the final years of the 19th century when it was demolished to make way for the new War Office building.

By the end of the 19th century a large

portion of the site along both the north and south sides of Whitehall Place had been cleared in preparation for the construction of new government offices fronting Whitehall.

Whitehall

By 1766 the street outside the palace grounds appears to have predominantly consisted of metallated gravel. As shown on a plan dated 30 May 1766 the majority of the street between the Holbein Gate and the King Street Gate was paved with Purbeck stone (TNA WORK 30/346). Amongst the variety of building materials used in the construction of the new Privy Garden wall were fragments of Purbeck limestone paving slabs. This suggests that the Purbeck slabs were being used to pave the road in 1723 after it was widened. While none of the trenches within the area supposedly paved with Purbeck slabs revealed earlier road surfaces, a number of the trenches to the north of the Holbein Gate did confirm the presence of a number of successive gravel road surfaces (not illus).

SPECIALIST REPORTS**The post-Roman pottery***Chris Jarrett**Introduction*

In total 116 sherds of medieval and post-medieval pottery representing 107 Minimum Number of Vessels (MNV) were recovered from the site, and although 23 sherds were unstratified, a large proportion of these was assigned to Trench 32/33 and did not contain any ceramics of note (Fig 2b). The date range of the pottery covers the 11th century through to the 19th century. Museum of London pottery type codes are used in the following text (LAARC 2007).

Medieval

Trench 36 produced in the garden soil [370] a sherd of early medieval sand and shelly ware (EMSS) (Fig 2b), dated 1000–1150, while pit [154] in Trench 44 produced a single sherd of coarse London-type ware (LCOAR) with external glaze splashes, dated 1080–1200 (Fig 11).

Late 16th century

Pottery was found solely in Trench 36 (Fig 2b), and the garden soil [109] and consisted of local post-medieval redwares as a cauldron rim in PMRE and a sooted base sherd in PMR. Residual pottery consisted of south Hertfordshire greyware and a small, over-fired sherd of Saxon Ipswich ware (IPSF).

Early 17th century

Of the six sherds of pottery found in this phase, a small, flat base sherd of a vessel in a miscellaneous Middle Saxon North French greyware (NFGW) was residual (with a sherd of early post-medieval redware: PMRE) in the backfill of the construction cut for well [24], and a sherd of early medieval sandy ware (EMS) was noted in dump layer [29], both found in Trench 13 (Fig 2b). Three sherds of pottery dated to the mid-17th century came from Trench 36 and the linear ditch [108] and these were as a Surrey-Hampshire border redware (RBOR) dish with a flat rim, a post-medieval redware small rounded jar, and a blue and white decorated tin-glaze

earthenware (TGW D) charger. The Whitehall Palace map of 1670 shows the location of this pottery group to be in the Privy Garden (Fig 5).

Late 17th century

There was a varied range of dated pottery types recovered from this phase (19 sherds, 9 MNVs). From Trench 44 (Fig 2a), the construction cut for the brick drain [131] produced 13 sherds of residual medieval pottery as a single sherd of EMSS, seven sherds from a LCOAR jug, and five sherds from a cooking pot in sandy shelly ware, with a group of three finger marks found on the top of the expanded rim. This group of pottery was probably originally derived from a truncated mid- to late 12th-century dated pit located on the front side of The Horse Guard Yard. From Trench 52 (Fig 2a), another sherd of Middle Saxon IPSM was recovered from the garden soil [184]. In the same trench, dump layer [316] produced sherds of LCOAR and contemporary between 1580 and 1700 are sherds of BORDY, PMBL and PMR. This pottery came from an area in front of the Banqueting House shown on the 1670 map.

18th century

29 sherds of fragmentary pottery representing 27 MNVs are noted in this phase. Much of the pottery came from Trench 36. The demolition layer [163] has four sherds of pottery as BORDG, PMR and a plain white tin-glaze (TGW C) plate dating to the late 17th to early 18th century. The possible garden soil [378] produced, amongst the 16 sherds recovered from it, late 18th-century ceramics in the form of a medium cylindrical jar in painted creamware (CREA PNTD), Chinese porcelain, London stoneware jars and sherds from two Westerwald stoneware (WEST) seltzer bottles. The last reflects the fashion for spa culture at this time and the consumption of mineral waters. The deposit also produced another sherd of fine Ipswich ware (IPSF). Of note, in the backfill of the construction cut of brick wall [389], built for the new Privy Garden, was a handled bowl with a flat-topped rim in Staffordshire mottled glazed ware; drinking forms are usually the main occurrences of this pottery type when found in London. Associated with the latter

wall, the dump layer [396] produced of note a tea bowl in Chinese porcelain (CHPO BW) and a TGW C chamber pot handle. In Trench 44, the linear cut [159] contained a residual sherd of an Earlswood ware (EARL) medieval jug; this Surrey industry made good quality wares which occasionally found their way to London.

19th century

Much of the pottery (35 sherds or 33 MNVs) appears to be residual in this phase, although a black basalt teapot (BBAS), very fashionable in the Regency period, was noted from the garden soil [375] in Trench 36 and a purple geometrical design transfer-printed white-ware (TPW 4) plate came from demolition debris [41] in Trench 14. A large TPW plate of poor quality (the late 19th- to early 20th-century geometrical/floral design is badly aligned) was noted in Trench 13, from the demolition rubble.

20th century

Of note was an intact late 19th- to early 20th-century Bristol-glazed English stoneware spouted ink bottle, with an illegible, small maker's stamp above the base. This was recovered from a dump layer in Trench 1.

Discussion

The post-medieval pottery, perhaps because of its fragmentary nature, recovered as a small sample owing to the excavation methodology, surprisingly demonstrates little about the status of this area of Westminster, especially as it was recovered from an area of Royal Palaces and Government administration.

The medieval and later ceramic building material and stonework

Kevin Hayward

Introduction

A large and diverse group (476kg) of building material was examined in order to determine its age, origin and material type.

Methodology

The ceramic building material and stone were examined using the London system of classification with a fabric number alloc-

ated to each object.⁴ The application of a 1kg mason's hammer and sharp chisel to each example ensured that a small fresh fabric surface was exposed. The fabric was examined at x20 magnification using a long arm stereomicroscope or hand lens (Gowland x10). Comparison was then made with the Pre-Construct Archaeology building material reference collection to determine the fabric type, source and period of use. Finally, thin-section preparation and analysis was undertaken on one worked stone sample (KH1) [161] where conventional hand specimen discrimination was not successful in determining its source. Photomicrographs (Leica DFC 320 Digital Camera) were taken from this section and other petrological samples compiled from earlier research (Hayward 2009; in prep) on rock types that were also identified in the Precinct Wall in order to illustrate the diversity of fabric types (Fig 30).

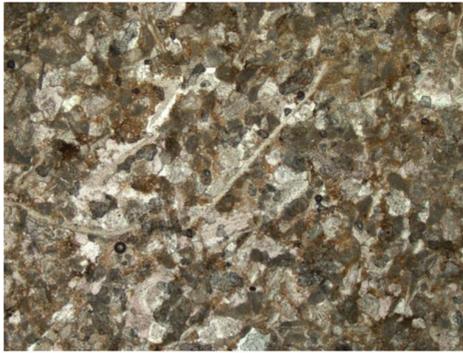
Medieval roofing and flooring tile

There was a dearth of medieval roofing and floor tile. Examples are limited to fragments of peg tile made from the late medieval red iron oxide fabric 2587 (1240–1450) recovered from a 17th-century demolition layer observed in a trench along the east side of Whitehall within the former Privy Garden. Also from the same general area as the Privy Garden is the only example of a medieval glazed floor tile, complete (110 by 110 by 21mm) and made from the local sandy fabric 2320 (1300–1500), in a 17th-century garden soil layer. Stone types that typify medieval construction such as Purbeck marble are absent or lacking (Kentish ragstone). Indeed, some of the degraded Reigate and Caen stone used in the 18th-century Privy Garden wall may well in fact be fresh consignments supplied to construct the Tudor Palace (see below).

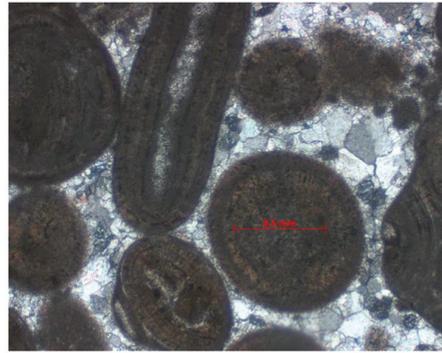
This near absence of medieval roofing and floor tile is the opposite to what one might expect given the proximity of the late 13th-century York Place and the large quantity of demolished medieval flooring and roofing associated with rebuilds/repairs of Westminster Abbey (Hayward in prep).

The Tudor and Jacobean red brick structures

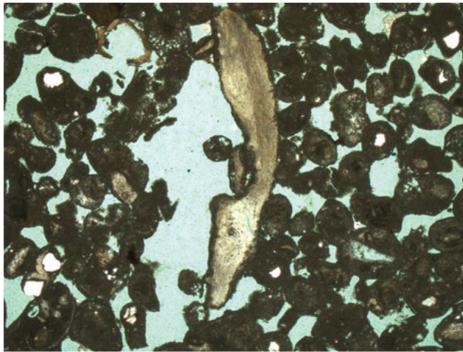
The excavations encountered a number of



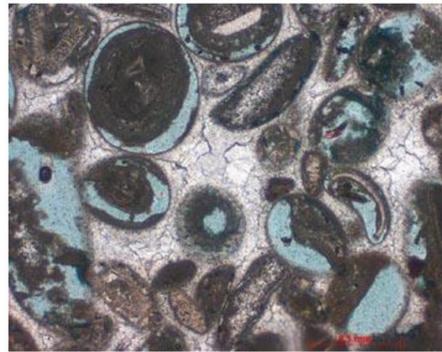
a) Orange-yellow ashlar Caen stone WQH07 [161]



c) Corsham oolite (outcrop sample) KH122



b) Portland Whit Bed (outcrop sample) KH82



d) Coombe Down oolite (outcrop sample) KH98

Fig 30. Photomicrographs of the post-medieval limestone ashlar and mouldings reused in the 18th-century Privy Garden wall, field of view 2.4mm Plane Polarised Light

red-brick structures constructed in English garden wall bond, which is a repeating sequence of three courses of stretchers followed by a course of headers with a queen closer as the penultimate brick at either end of the header course. This bond was in use between *c.*1600 and 1800. The structures with this bond included garden walls, the larger external foundation and internal walls of buildings as well as some brick drains that were concentrated along the west side of Whitehall between Richmond Terrace and Horse Guards Avenue and especially along the western edge of Banqueting House and close to the 18th-century Privy Wall Garden. However, this bond was also used in structures found along the western side close to King Street Gate and opposite Horse Guards Avenue. These particular structures were constructed of bricks which were made from the local sandy brickearth clays in fabrics 3033 and 3046, dated to 1450–1700,

and are therefore broadly contemporary with the adjoining palatial constructions of this period. These include Wolsey's extension of York Place (1515–1530), the primary Henrician build of Whitehall Palace (1530–1537) (Thurley 1999), including the Sports Complex (Green & Thurley 1987), and subsequent Elizabethan and Stuart additions and rebuilds (Thurley 1999), all of which have archaeological or documentary evidence for the use of these bricks.

It is possible to some extent to identify and date some of these structures based on brick fabric, form and mortar type. First, the earliest, wider, flatter (231 by 205mm–212 by 51mm) Wolsey and Henrician bricks (Type A) (Green & Thurley 1987, 127) turn up occasionally in 16th-century walls such as the eastern of a pair of walls of King Street Gate and a plinth that may have formed part of a range of buildings on the south side of 'The Court' as seen on the Agas Map of *c.*1562 (Fig

4). These are the exceptions, however, and as a rule of thumb it is better to subdivide the earliest 16th-century structures from the latest Stuart (1685–1698) and post-Great Fire (1698–1799) builds by the type of mortar and the presence or absence of post-Great Fire clinker bricks 3032; 3032nr 3033; 3034 (1664–1900). The mortar type used in the earlier group, which generally consists of a softer sandy-brown lime recipe with angular chalk inclusions, is present in the wall of the King Street Gate and foundation walls of the Privy Garden wall, the plinth, the brick wall adjoining the possible bay window of the Great Hall, and in the unidentified brick structure within the Privy Garden aligned with and possibly pre-dating the early 17th-century Banqueting House.

Later Stuart and post-Great Fire constructions, such as the culvert complex of the Privy Garden path and (along Whitehall) the northern wall of a range of buildings in what is now Horse Guards Avenue, *eg* Pelham House, and the 18th-century Privy Garden brick and stone wall (see below), use a lighter cream mortar with gastropod shells and occasional flecks of clinker, typical of this period. Post-Great Fire bricks are also used in the Privy Garden path drain and the culvert along Whitehall.

The petrology and origin of the reused stone in the 18th-century Privy Wall Gardens

A large moulded stone assemblage (357kg) was discovered reused in the 18th-century garden walls (Fig 24). Unfortunately the breakage of these mouldings, and their subsequent repointing in thick mortar has succeeded in removing any definable form that may have helped determine their primary function and period of use within Whitehall Palace and its setting. It is for this reason that a petrological approach has been adopted to date the stone. Recent studies (Tatton-Brown 1991; Stanier 2000; Hayward 2009; Samuel 2011; Hayward in prep) have begun to show that the choice of rock-type for construction and embellishment in Roman, medieval and post-medieval London changed over time in response to technological advances, quarry ownership, quarry demise, the type of building, and the contemporary economic and socio-political setting.

The use of particular types of stone in contemporary structures elsewhere in London, *eg* Somerset House, may begin to help determine whether this group all belonged to the Tudor-Jacobean palace, the gatehouses (Holbein; King Street) or whether in fact there is a medieval component relating to York Place (Thurley 1999) or the demolition of nearby Westminster Hall.

A feature of the building material assemblage fronting the east side of Whitehall was the quantity of recycled stone ashlar and mouldings identified in wall segments of the 18th-century Privy Garden wall. As well as chalk and flint, hand specimen and thin-section comparative analysis has been able to identify seven high quality marbles and freestone materials used in its construction. (Freestones are fine-even-grained rocks with an open porous texture that enable the rock to be worked or carved in any direction.) A variety of origins are suggested.

Petrology – Limestones

Lithotype 1

Fine, pale cream-yellow oolitic limestone (oolitic grainstone) (Dunham 1962)

Geological source: Middle Jurassic (Bathonian) Avon-Wiltshire

The most common type of construction material, these even bedded limestones were present in two sub-types (a & b) in large (320 by 230 by 160mm) ashlar blocks and cornices from the 18th-century Privy Garden wall.

a) Box Groundstone/Combe Down Oolite (shelly variant) Bath-Box region (Fig 30d)

b) Monks Park stone/ Corsham stone (ooid-rich) Corsham (Fig 30c)

Unlike other types of Bath-stone such as Taynton stone (see below) these are rarely found in a medieval context and are common (in association with Portland stone, Taynton stone and Caen stone) in 16th- and 17th-century palatial structures, *eg* Somerset House (Hayward pers obs). An early post-medieval origin is suggested.

Lithotype 2

Very fine, hard pale grey oolitic limestone (oolitic grainstone) (Dunham 1962)

Geological source: Portland Whit Bed and Base Bed Upper Jurassic (Portlandian) Dorset Coast

Two very large cornice blocks of this distinctive rock (both in excess of 50kg) were recovered from the 18th-century Privy Garden walls and may have been dismantled from the same structure. Even more definitive as a post-medieval freestone material, these open-grained Portland stones (Fig 30b) were first quarried and supplied in blocks of this size to London after the 1620s for buildings including Banqueting House at Whitehall (Cox & Norman 1930) and probably the great portico of the pre-Great Fire St Paul's Cathedral (Benham 1902; Campbell 2007, 10). It is feasible that this material could have come from waste relating to the redesign of the Banqueting House by Jones between 1625 and 1628 (Thurley 1999, 85) but possibly also from the later 17th-century remodelling of the Holbein or King Street Gate or even the demolished gun platform (Thurley 1999, 135) which was rebuilt in 1668. All of these structures need to be considered as they all lie close to the Privy Garden wall.

Lithotype 3

Fine condensed cream, yellow or yellow-brown limestone (packstone) (Dunham 1962)

Geological source: Caen stone Middle Jurassic (Bathonian) Caen, Département Calvados

Present as ashlar from the 18th-century Privy Garden wall these limestones have a varied character.

- a) Yellow packstone
- b) Orange-yellow sparry packstone (iron-rich) (Fig 30a)

The first sub-type is commonly associated with medieval masonry in ecclesiastical and secular buildings throughout London and southern England from the late 11th century and has been identified in a buttress in the late medieval, 1465–1476, rebuild of the Great Hall of York Place (Thurley 1999, 8). Their use, however, extends into the post-medieval period in the 16th-century Somerset House (Hayward pers obs) and Wren's construction of St Paul's Cathedral (Campbell 2007, 91).

The latter variant had only been identified before in cornice fragments associated with the embellishment of the initial 1540s bay windows of Somerset House (Hayward pers

obs). They were distinct enough in hand specimen to warrant further analysis in thin-section to verify their character and source. The coarser, sparry texture of this sub-group (see Fig 30a) is attributable to the presence of porous echinoid plates that absorb iron after burial and account for the oxidised rusty colour. In light of this, it seems probable that this variant came from either the Tudor palace or a Stuart addition.

Lithotype 4

Orange-brown banded shelly oolitic limestone (shelly-oolitic grainstone) (Dunham 1962)

Geological source: Burford/Taynton stone – Middle Jurassic (Bathonian) Taynton, Burford West Oxfordshire.

Present as ashlar from the 18th-century Privy Garden wall these coarse oyster rich Bath-stones are distinctive enough to be assigned a separate source of the South Cotswolds to the more even-grained freestones represented by Lithotype 1. Their widespread use in medieval and later post-medieval ecclesiastical and palatial buildings in London (Campbell 2007, 91) and Windsor (Worssam 2010), for example, can be attributable to the proximity of the outcrop to the navigable Evenlode, a tributary of the Thames.

Glauconitic limestones and sandstones

Fine-grained lime-green (glauconitic) limestone (Reigate-Mertsham stone)

Geological source: Upper Greensand, Upper Cretaceous, Reigate-Mertsham (East Surrey).

Large (350 by 210 by 190mm) degraded ashlar blocks of this distinctive low density micaceous limestone from the phase 10 Privy Garden wall could have either a medieval or post-medieval origin. As well as being the most important ashlar material for the medieval construction of Westminster Abbey since 1060 (Hayward pers obs), and other monasteries (Samuel 2011) and defensive structures (Tatton-Brown 1991, 363) in London, window jambs of this material can be found nearby in the late medieval (1465–1476) south range of York Place (Thurley 1999, 7). It continued to be used into the late 17th century in St Paul's Cathedral (Campbell 2007, 91).

Hard, dark grey calcareous sandstone (Kentish ragstone)

Geological source: Lower Greensand (Hythe Beds) Maidstone, Kent

Another ubiquitous Roman, medieval and post-medieval building material, Kentish ragstone is present in ashlar blocks of the Privy Garden wall and could have come from any number of structures in the vicinity.

Marbles

Fine white crystalline metamorphic limestone (Carrara marble)

Geological source: (Tertiary) Tuscany, Italy

The only moulding of note is an unweathered microcrystalline marble carved into a small ornate cornice from the Privy Garden wall. It seems more probable, given its fresh condition and widespread use in nearby 17th-century repairs and additions to Whitehall Palace such as the late 17th-century (1686–1688) stairs at the Banqueting Hall (Thurley 1999), that this is post-medieval in origin.

Discussion

Including variants, petrological analysis has identified nine types of high quality limestone, sandstone and marble in ashlar and degraded mouldings that have been re-used as foundation material in the later 18th-century Privy Garden wall. Although some material types (*eg* yellow Caen stone; Reigate stone) may be attributable to recycled material from medieval structures nearby such as York Place, the majority (orange-yellow Caen stone; Corsham stone, Combe Down oolite; Portland Whit Bed; Carrara marble) have a petrological character that typifies later post-medieval construction (Fig 30). The most obvious candidates are the Tudor Whitehall Palace and especially the later Stuart modifications with the Portland stone.

With this in mind, two events may account for a ready 'quarry' of stone, released from its primary context for reuse in these walls. The 1691 fire that gutted the Stone Gallery, may account for the reuse of some of these materials. It lay adjacent to the Privy Gardens and there are contemporary accounts by Luttrell (Thurley 1999) of workmen clearing debris into piles in the Privy Garden before

carting it away. Another possibility is the impact that the more devastating palatial fire of 1698 had on the superstructure and the consequential release of thousands of tonnes of masonry and brick.

However, these fires occurred some 30 years prior to the construction of the new Privy Garden wall which was moved eastwards in 1723 in response to the widening of Whitehall. Far more probable is that some or all of these stones derive from the large King Street Gate which was dismantled at this time as part of the widening scheme. The Holbein Gate was dismantled later in 1759. A 1723 proposal which deals with the setting back of the Privy Garden wall states 'that the new wall is to be built from material of the old and made good with the stones from the demolition of King Street Gate' (TNA WORK 4/2).

Although built in the 1530s there was substantial remodelling of the Great (Holbein) Gate and Court Gate including its embellishment in freestone and brick (Thurley 1999, 119–20) after the restoration (1660–1685) and it is possible that the King Street Gate was renovated then too. This may account for the presence of the reuse of Portland stone that was being shipped in from Dorset in enormous quantities at this time in response to the demands of St Paul's Cathedral (Campbell 2007, 91).

The clay tobacco pipe types

Chris Jarrett

Introduction

A small sized assemblage of clay tobacco pipes was recovered from the site as 83 fragments: 18 bowls and 65 stems. The bowl shapes, which date to between *c.*1610 and 1910, were classified according to Atkinson and Oswald's (1969) typology (AO) and 18th-century examples by that of Oswald (1975). Only the bowls are discussed here by their types and distribution, while two fragmentary bowls could only be broadly dated to the 18th–19th centuries.

The earliest bowl recorded is the spurred AO8, dated 1610–40; it has full milling of the rim and a fair finish. It was recovered from a 17th-century linear cut, [108], in

Trench 36, located in the area of the Privy Garden (Fig 5). A single, straight sided, heeled AO18 bowl, dated 1660–80, with three quarters rim milling and of a fair finish was noted in Trench 36 and found in the 19th-century backfill of the basement. Bowl types dated 1680–1710 only occur as two examples of the straight-sided, heeled AO22 type. A complete, unstratified example has a quarter milling and is of a fair finish, while a damaged bowl was noted in an 18th-century pit [186] in Trench 52, located in front of the Banqueting House (Fig 2).

The 18th-century bowls are of three types, the earliest being the upright, heeled OS10 shape, dated 1700–1740, with six examples. Three examples came from Trench 14 with a fragmentary example noted in dump [41] (Fig 2), while two examples came from the backfilled basement located in the area of HM Treasury and the site of 18th-century houses. One of the bowls is marked on the heel with the initials R R; several contemporary pipe makers had these initials (see Oswald 1975, 144), although a local pipe maker R Rideout, 1760–66, 79 Peter St, Westminster is documented (Heard 2009).

Trench 52 produced the three other OS10 bowls. Two were derived from dump layer [320] and one is marked I I; several pipe makers are known with these initials in London, although John Jarman (1) took his son with the same name as an apprentice in 1732, and this son is documented between 1732 and 1749 in the Westminster Polls (Oswald 1975, 139). A third, unmarked, narrow bowl was found in pit [320]. Trench 52 was located in front of the Banqueting House.

The OS12 bowl, similar to that of the OS10, but with a narrower stem, occurs as a single example in an 18th-century dump layer [356] in Trench 36. This bowl is initialled I W; there were several mid-18th-century pipe makers in London who could have made it, although so far no documented contemporary Westminster pipe makers are known with these initials (Heard 2009).

Late 18th-century spurred bowls are present as two examples of the OS23 shape, dated 1760–1800, and both have Hanoverian coats of arms with a pointed petal tulip on the front of the bowl. One unstratified example from Trench 32/33 has its spur missing and the other, from a 19th-century backfill of

the basement in Trench 14, has the family name P surviving. Similar bowls have been found in Westminster initialled I P and can probably be ascribed to John Powell I, 1746, St Margaret's, Westminster or John Powell II, Pye Street, 1749–58 (Heard 2009).

Only a single 1820–1860 dated AO28 bowl occurs; it is decorated with even sized fluting below a tassel and drape border around the rim. Of the family name only L is legible; three local Westminster pipe makers are known: William Lee, 22 Blue Anchor Yard, 1851, Mary Isabella Longstaff, 4 Old Rochester Row, 1841–51, wife of Thomas Longstaff, 1841–51 (Heard 2009). This style of decorated pipe appears to be more common in West London. The bowl was recovered from the 19th-century possible garden soil, [346], in Trench 36.

The latest bowl type recorded is the AO30, usually defined as without a heel and dating from c.1840–1910. Both bowls are not maker marked. An unstratified example from Trench 32/33 is decorated with ribs (with point definition) on the front and back of the bowl. The other bowl is more elaborate with a rib in the form of a leaf on the back of the bowl and a spear-like emblem on the bowl front, and on its base there is a small rod (creating a stand), while scroll motifs continue onto the stem. This bowl was found in the 19th-century possible garden soil [346], in Trench 36.

Discussion

Although only a small assemblage of clay tobacco pipes was recovered from the site, the bowls do indicate something of the social environs of Westminster. The bowls are on the whole of a good quality and so they fit in well with an area that would have residents of a higher socio-economic status, although the area would also have been frequented by servants and the general London populace. Even if the sample of clay tobacco pipes is small, it is also interesting that of the two spurred OS23 bowls recovered and found in different locations, both have the Hanoverian Coat of Arms, which might display their owners' allegiance to the monarchy. This may have been significant in the 18th century when the 'London Mob' was not averse to displaying open hostility to the Royal Family and the aristocracy. The pipes therefore fit in



with what might be expected for this area of Westminster, where the homes of aristocracy or politicians, or where they worked and visited, were located and this social group may have been on the whole more inclined to have been monarchists. However, in areas of London where low socio-economic groups resided then some groups of pipes also have a high proportion of armorial bowls with royal badges, such as those from the Tabard Square excavations (Jarrett in prep). A good proportion of the pipes are maker marked, possibly another indicator of a more costly product, and many of these bowls could have been made by master pipe makers living and working in Westminster.

The post-medieval glass

Chris Jarrett

Introduction

The excavation produced a total of 59 sherds of post-medieval glass, mostly derived from wine bottles. The condition of the glass ranges from shard material to intact vessels. Only the items of interest have been discussed here; a complete archive report is available (Jarrett 2011).

18th-century deposits

The largest quantity of glass from the excavation came from Trench 36 and the possible garden soil [378] (Figs 2a & 2b), as 42 shards. All the material, in mostly black and dark olive green coloured glass, is as wine bottles, recognisable almost entirely as the cylindrical form, as some eleven vessels. The wire string rim finishes are consistently of a c.1780–90 date (Dumbrell 1983, 38). An exception was a wine bottle rim with a late 17th-century string rim finish.

19th-century deposits

The basement in Trench 14 (Figs 2b & 28) produced in its fill [49] four sherds of early 18th-century wine bottle glass, one with a wire string finish dated c.1720–40 (Dumbrell 1983, 38), while a mallet bottle with a high, rounded kick is dated c.1710 (Dumbrell 1983, 37). Found in the possible garden soil [375], Trench 36, was the kick base and inturned wall of a wine bottle, possibly of the

mallet type, dated to the mid- to late 18th century.

20th-century deposits

The levelling layer [48], in Trench 15, produced three intact glass bottles, two of which are aqua coloured, plain, late type, Hamilton bottles, dated from the last three decades of the 19th century (Talbot 1974, 40). The third bottle is an amber soda glass cylindrical bottle, with a rounded blob rim, short neck and rounded shoulder with embossed on it 'SELTZER WATER BOTTLE BRIGHTON' over a possible phoenix and 'trade mark' within a rectangle. This bottle undoubtedly refers to a mineral water which, originally manufactured by Struve and Co in a 'German Spa' located in Queen's Park, Brighton, was by 1899 being manufactured by Hooper & Co of London (Kelly 1899, 60).

CONCLUSION

The Whitehall streetscape improvements revealed elements of a diverse range of archaeological deposits and structures of various dates, which, bearing in mind the relatively shallow nature of most of these trenches, means that there is a wealth of unexplored structures under these streets.

Evidence for activity during the Middle Saxon period was only seen in one trench. However, the paucity of evidence for occupation during this phase may be attributed to the limited depth of the majority of the trenches rather than being reflective of a lack of activity during this period. Other sites in the vicinity have revealed the presence of a substantial hall. During the medieval period the area along Whitehall became increasingly more populated as Westminster developed as a key administrative centre. It was during this period that the establishment and subsequent expansion of York Place, the London residence of the Archbishops of York, occurred. One of the expansion phases of York Place initiated by Archbishop Rotherham during his tenure from 1480 to 1500 involved rebuilding the palace's kitchen complex. A small part of this complex was uncovered during the present work. The limited depth of the trenches did not in most cases allow for the removal of the entire thickness of



the demolition debris and/or post-medieval made ground. As such it is difficult to gauge the level of survival of remains related to York Place and subsequently Whitehall Palace as they, if they survive, would be covered by these deposits. However, a number of walls and footings belonging to the buildings of Whitehall Palace were uncovered during the present work. These included what appeared to be the remains of the King Street Gate, a bay window of the Great Hall, the Court Gate, the lodgings and office of the Surveyor, the gun platform and the New Gallery. Many of these buildings were substantially damaged by the fire of 1698.

It also seems that the buildings erected after the 1698 fire roughly respected the layout of the palace courtyards, alleys and streets. To some extent the post-fire development seemed to have utilised the earlier footings. This certainly appeared to be the case with Pelham House as seen by the presence of earlier brickwork within the exposed footings and perhaps further substantiated by the fact that the dimensions of the earliest phase of the building correspond to those of the Gallery occupying the site of the edifice before the fire.

In other cases, such as Taylor House and the Privy Garden wall, the footings for the post-fire structures were constructed largely out of reused material reclaimed from the clearing of the site prior to redevelopment. Documentary evidence pertaining to the construction of the new Privy Garden wall specifically stated that the material recovered from taking down the old wall should be used in the construction of the new wall.

The later post-medieval development and the construction of the various government offices in the late 19th and 20th centuries saw the destruction of much of the already fragmentary remains of what was once the largest royal palace in Europe. Prior to the construction of some of the later buildings archaeological investigations were carried out, although this was not the case for the buildings erected prior to the 1930s. Despite this, as has been shown by the current work, remains of the palace and post-palace buildings still survive below the present streetscape albeit truncated by the many services crossing the area.

ACKNOWLEDGEMENTS

Pre-Construct Archaeology Limited would like to thank Atkins Heritage for commissioning this project on behalf of the City of Westminster Council who funded the archaeological investigation. Additional thanks to Diane Walls, English Heritage GLAAS, for monitoring the works on behalf of the City of Westminster. The author would like to thank the many Pre-Construct Archaeology staff members who worked on the site between 2007 and 2010. Special thanks to Rebecca Haslam for supervising the first half of the project. The author would also like to thank Jennifer Simonson for illustrations, Chris Mayo for project management, and Jon Butler for post-excavation management and editing of this report.

Jbutler@pre-construct.com

NOTES

¹ *Post 1992 Museum of London Code Expansion Building Material, LAARC 2007* source: www.museumoflondon.org.uk/NR/rdonlyres/DBB-COD2D-C459-43 (accessed Dec. 2012)

² In London this type of mortar was in widespread usage between c.1200 and 1600.

³ The Cofferer was a principal officer in the royal household, in charge of other officers, whose wages he paid.

⁴ *Post 1992 Museum of London Code Expansion Building Material, LAARC 2007* source: www.museumoflondon.org.uk/NR/rdonlyres/DBB-COD2D-C459-43 (accessed Dec. 2012)

BIBLIOGRAPHY

Primary sources

The National Archives (TNA)

Court of the Exchequer
E 36/251 Treasury of the Receipt: Miscellaneous Books: Works, 1532–3

E 36/252 Treasury of the Receipt: Miscellaneous Books: Works, 1533

E 351/3283 Pipe Office: Declared Accounts, 1669–70

E 367/6784 Pipe Office: Particulars, Warrants and Transcripts for Crown Leases: London and Middlesex, 1722

Office of Works

WORK 4/2 Minutes, 1720–4

WORK 5/43 Accounts: Ordinary and Extraordinary, 1689–90

- WORK 6/7 Miscellanea: Warrants and Correspondence, 1717–23
- WORK 6/18 Miscellanea: Memorials, 1762–73
- WORK 30/346 Public Buildings in England: Plans and Drawings: Whitehall 1766
- Treasury
- T 54/28 Entry Books of Warrants concerning Appointments, Crown Leases and Other Matters Not Relating to the Payment of Money, 1723–4
- T 56/18 Various Entry Books of Warrants: Lord Chamberlain 1715–33
- T 55/25 Entry books of Warrants for Crown Leases and Other Documents Concerning Crown Lands: London and Middlesex, 1803–5
- Unpublished site assessment reports**
- Hayward, K M J, 2011 'Building material assessment' in Jorgensen 2011, 157–74
- Hégarat, K, & Allott, L, 2011 'Whitehall, Streetscape, London (WQH 07): environmental archaeological assessment' in Jorgensen 2011, 175–9
- Jarrett, C, 2011 'Glass assessment' in Jorgensen 2011, 150–2
- Jorgensen, P, 2011 *Assessment of an Archaeological Watching Brief during the Whitehall Streetscape Improvement Project, City of Westminster PCA Report*
- Langthorne, J, 2011 'Human bone assessment' in Jorgensen 2011, 156
- Secondary sources**
- Armitage, P, 2004 'The animal bones' in J Leary with G Brown, J Rackham, C Pickard & R Hughes *Tatberht's Lundenwic: Archaeological Excavations in Middle Saxon London* Pre-Construct Archaeology Monograph 2, London, 105–12
- Atkinson, D, & Oswald, A, 1969 'London clay tobacco pipes' *Journal British Archaeology Association* 32, 171–227
- Benham, W, 1902 *Old St Paul's Cathedral*, London
- Blackmore, L, 1988 'The pottery' in Cowie *et al* 1988, 81–110
- Blackmore, L, 1989 'The pottery' in Whytehead *et al* 1989, 71–107
- Blackmore, L, 2003 'The pottery' in Malcolm *et al* 2003, 225–41
- Blackmore, L, 2008a 'Middle Saxon wares' in Cowie & Blackmore 2008, 181–91
- Blackmore, L, 2008b 'Vessel glass' in Cowie & Blackmore 2008, 199–200
- Blanchard, I, 2007 *Twelfth Century. A Neglected Epoch of British Social and Economic History*, Newlees
- Boon, G C, 1974 *Silchester: the Roman Town of Calleva*, Newton Abbott
- Campbell, J W P, 2007 *Building St Paul's*, London
- Coombe, P C, Grew, F, Hayward, K M J, & Henig, M, in prep *Corpus Signorum Imperii Romani. Great Britain 1.10 Roman Sculpture from London and the South-East*, Oxford
- Cowie, R, 2004 'The evidence for royal sites in Middle Anglo-Saxon London' *Medieval Archaeology* 48, 201–9
- Cowie, R, & Blackmore, L, 2008 *Early and Middle Saxon Rural Settlement in the London Region* MoLAS Monograph 41, London
- Cowie, R, & Blackmore, L, with Davis, A, Keily, J, & Rielly, K, 2012 *Lundenwic: Excavations in Middle Saxon London, 1987–2000* MoLA Monograph 63, London
- Cowie, R, & Whytehead, R L, with Blackmore, L, 1988 'Two Middle Saxon occupation sites: excavations at Jubilee Hall and Maiden Lane' *Trans London Middlesex Archaeol Soc* 39, 47–163
- Cowie, R, & Whytehead, R, 1989 'Lundenwic: the archaeological evidence for Middle Saxon London' *Antiquity* 63, 706–18
- Cox, M, (ed.) 1926 *Survey of London: St. Margaret, Westminster, Part I: Queen Anne's Gate Area*, vol 10, London
- Cox, M, & Forest, G, (eds) 1931 *Survey of London: St. Margaret, Westminster, Part III: Whitehall II*, vol 14, London
- Cox, M, & Norman, P, (eds) 1930 *Survey of London: St. Margaret, Westminster, Part II: Whitehall I*, vol 13, London
- Driesch, A von den, 1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Mus Bull 1, Cambridge, MA
- Driver, J C, 1982 'Medullary bone as an indicator of sex in bird remains from archaeological sites' in Wilson *et al* 1982, 251–4
- Dumbrell, R, 1983 *Understanding Antique Wine Bottles*, Woodbridge
- Dunham, R J, 1962 'Classification of carbonate rocks according to depositional texture' in W E Ham (ed) *Classification of Carbonate Rocks* American Association of Petroleum Geologists, Memoir 1, Tulsa, 108–21
- Dyson, T, Samuel, M, Steele, A, & Wright, S, 2011 *The Cluniac Priory & Abbey of St Saviour Bermondsey, Surrey* MoLA Monograph 50, London
- Evison, V I, 1988 'The glass' in Cowie *et al* 1988, 119–23
- Evison, V I, 1989 'The Saxon glass' in Whytehead *et al* 1989, 112–16
- Gater, G, & Wheeler, E, (eds) 1935 *Survey of London: St. Martin-in-the-Fields I: Charring Cross* vol 16, London
- Grant, A, 1982 'The use of toothwear as a guide to the age of domestic ungulates' in Wilson *et al* 1982, 91–108
- Green, H J M, & Cowie, R, 2008 'Site U: Whitehall (Middlesex)' in Cowie & Blackmore 2008, 90–100

- Green, H J M, & Thurley, S J, 1987 'Excavations on the west side of Whitehall 1960–2 Part 1: From the building of the Tudor Palace to the construction of the Modern Offices of State' *Trans London Middlesex Archaeol Soc* 38, 59–130
- Green, M, (ed) 1886 *Calendar of State Papers Domestic: Interregnum, 1659–60* vol 204, London
- Ham, W E, (ed) 1962 *Classification of Carbonate Rocks* American Association of Petroleum Geologists, Memoir 1, Tulsa
- Hayward, K M J, 2009 *Roman Quarrying and Stone Supply on the Periphery – Southern England. A Geological Study of First Century Funerary Monuments and Monumental Architecture* BAR British Series 500, Oxford
- Hayward, K M J, in prep 'Types and sources of stone' in Coombe *et al*
- Hayward, K M J, in prep 'The ceramic building material and stone' in P Jorgensen 'Excavation at Deans Yard, Westminster Abbey' *Trans London Middlesex Archaeol Soc*
- Heard, K, 2009 *London Clay Pipe Studies: The Clay Tobacco Pipe Industry in the Parishes of St Margaret and St John the Evangelist, Westminster* <http://www.kieron.heard.ukonline.co.uk/pipes/westminster/contents.htm>
- Jarrett, C, in prep 'The clay tobacco pipes' in D Killock & J Shepherd *Excavations at Tabard Square: 34–70 Long Lane and 31–47 Tabard Street, SE1* PCA Monograph
- Kelly, 1899 *Kelly's Directory Sussex*
- LAARC, 2007 *Post 1992 Museum of London Code Expansions Post-Roman Pottery*, << http://www.museumoflondon.org.uk/NR/rdonlyres/F0118AAF-EF24-4228-A07A-39F89E6F092E/0/post92mol_post_roman.pdf>>. Accessed 21 November 2012.
- Libois, R M, Hallet-Libois, C, & Roseaux, R, 1988 'Éléments pour l'identification des restes crâniens des poissons dulçaquicoles de Belgique et du Nord de la France, 2, Cypriniformes', *Fiches d'Ostéologie Animale pour l'Archéologie* 4, Centre de Recherches Archéologiques – CNRS (France)
- Malcolm, G, & Bowsher, D, with Cowie, R, 2003 *Middle Saxon London. Excavations at the Royal Opera House 1989–99* MoLAS Monograph 15, London
- Margary, I D, 1957 *Roman Roads in Britain. Volume I. South of the Fosse Way – Bristol Channel*, London
- Mason, E, (ed) 1988 *Westminster Abbey Charters 1066–c.1241* London Record Society 25
- Newdick, J, 1979 *The Complete Freshwater Fishes of the British Isles*, London
- Oswald, A, 1975 *Clay Pipes for the Archaeologist* BAR British Series 14, Oxford
- Pepys, S, 1660 in *The Diary of Samuel Pepys (vol 1)* ed H B Wheatley 1928, London
- Phillips, H, 1964 *Mid-Georgian London: a Topographical and Social Survey of Central and Western London about 1750*, London
- Rielly, K, 2003 'The animal and fish bone' in Malcolm *et al* 2003, 315–24
- Samuel, M, 2011 'Architectural fragments' in Dyson *et al* 2011, 184–99
- Sawyer, P, 1968 *Anglo-Saxon Charters: an Annotated List and Bibliography*, Royal Historic Soc, London
- Schmid, E, 1972 *Atlas of Animal Bones for Prehistorians, Archaeologists and Quaternary Geologists*, London
- Sidell, J, Wilkinson, K, Scaife, R, & Cameron, N 2000 *The Holocene Evolution of the London Thames: Archaeological Excavations (1991–1998)* MoLAS Monograph 5, London
- Sloane, B, Swain, H, & Thomas, C, 1995 'The Roman road and river regime' *London Archaeologist* 7:14, 359–70
- Stanier, P, 2001 *Stone Quarrying Landscapes*, Stroud
- Stiff, M, 2003 'The glass finds' in Malcolm *et al* 2003, 241–50
- Talbot, O, 1974 'The evolution of glass bottles for carbonated drinks' *Post-medieval Archaeology* 8, 29–62
- Tatton-Brown, T, 1991 'Medieval building stone at the Tower of London' *London Archaeologist* 6:13, 361–6
- Tatton-Brown, T, & Saul, N, (eds) 2010 *St George's Chapel, Windsor: History and Heritage*, Dorset
- Thomas, C, Cowie, R, & Sidell, J, 2006 *The Royal Palace, Abbey and Town of Westminster on Thorney Island* MoLAS Monograph 22, London
- Thurley, S, 1999 *Whitehall Palace: An Architectural History of the Royal Apartments, 1240–1690*, London
- Walford, E, 1875 *Old and New London: A Narrative of its History, its People, and its Places Vol 3*, London
- Whytehead, R L, & Cowie, R, with Blackmore, L, 1989 'Excavations at the Peabody Site, Chandos Place, and the National Gallery' *Trans London Middlesex Archaeol Soc* 40, 35–176
- Wilson, B, Grigson, C, & Payne, S, (eds) 1982 *Ageing and Sexing Animal Bones from Archaeological Sites* BAR British Series 109, Oxford
- Worssam, B, 2010 'The building stones of the Lower Ward of Windsor Castle' in Tatton-Brown & Saul 2010, 15–24