THE OLD MAIN GUARD: A SEQUENCE OF LATE MEDIEVAL AND POST-MEDIEVAL BUILDINGS IN THE INNER WARD OF THE TOWER OF LONDON

Stuart Watson

SUMMARY

An archaeological watching-brief at Tower Green, Tower of London during 2007 revealed the truncated stone foundations and cellar walls of a late medieval/early post-medieval building, with several later phases of brick rebuilding and alteration dating to the mid- and late 17th century. A comparison between the recorded structures and contemporary cartographic sources suggests that these remains are the foundations of a series of buildings known to have occupied the site on Tower Green from at least c.1562–63 to 1685, the latest phase of which was known as the Old Main Guard.

An earlier archaeological investigation on the same site conducted in 1975 revealed parts of the same structure. However, it soon became apparent that there was a disparity between the location of several of the same structural features recorded in 1975 and during the current investigation (Parnell 1979). The present work has provided an opportunity to correct this discrepancy in the archaeological record of the Tower of London.

As a World Heritage site, much is known of the Tower of London's development and historic role as a fortress and Royal Palace, what is perhaps less well known is its function as a workplace and these recent discoveries have shed some light on the working life of the Tower of London.

INTRODUCTION

Pre-Construct Archaeology Ltd was commissioned by Historic Royal Palaces to undertake an archaeological watching-brief at Tower Green (TQ 3355 8056), which is part of the Tower of London, situated within the London Borough of Tower Hamlets (Fig 1). The site at Tower Green lies within the Inner Ward of the Tower of London, with the White Tower to the east, the Beauchamp Tower to the west, and the Chapel of St Peter ad Vincula to the north (Fig 2).

The protected status of the Tower of London (World Heritage Site and Scheduled Ancient Monument) necessitated an archaeological investigation during remedial works to the paved areas of Tower Green. The watching-brief was conducted between 14 May and 13 August 2007 (site code: TOL103), and its main task was to monitor and record any archaeological remains exposed in three adjacent areas, designated A, B and C (Fig 3). The main focus of the investigation, Area A, lay in the central paved area that bisects Tower Green immediately to the south of the execution memorial (Fig 4). The remedial works to the paving involved relaying the uneven surface to improve the appearance of and access to the area. Area B was a small area located in the south-east corner of Tower Green where remedial works to drainage were monitored. Area C was located immediately south of Area A, on the grass of Tower Green, and was monitored during the

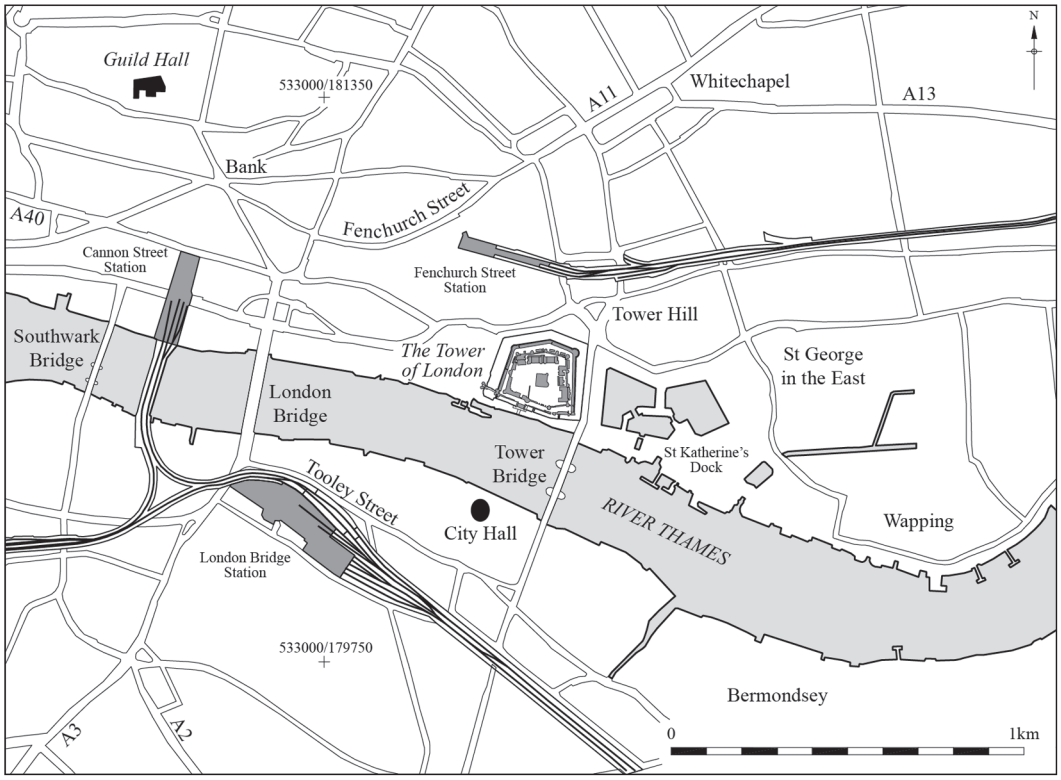

Fig 1. Site location plan

excavation of a trench for the provision of a new soak-away pipe, to facilitate rain water run-off from Area A.

The work in Area A uncovered significant archaeological remains and the majority of the discussion presented in this paper concentrates on those results. The limited data obtained from Areas B and C are also summarised.

In Area A it had been assumed that the shallow depths involved in the remedial work, of approximately 0.60m below current ground level, would have had little, if any, impact on surviving archaeological remains. However, as work progressed to level the site, it soon became apparent that archaeological remains were surviving at much higher levels than anticipated, and fairly soon the first significant remains were exposed — a wall foundation aligned north–south. From its length it was assumed to be the foundations of a garden wall, a view later confirmed by cartographic evidence (see below). As work continued to the west, various other foundations were exposed and it became evident that the remains of a major building had been uncovered. What was revealed were the truncated foundations of a cellared building, with various later phases of rebuilding and alterations. From cartographic evidence, and the records of an earlier archaeological investigation conducted in 1975 (Parnell 1979), it became evident that at least some of these remains were the foundations of a building known as the Old Main Guard.

In the light of these important discoveries, while the archaeological work in Area A was originally conceived as a watching-brief, discussions with Historic Royal Palaces allowed for the provision of a limited excavation (via sondages) to attempt to establish the extent and nature of the remains. However, the limited nature of the excavation, while succeeding in identifying the date, probable function and location of the building, could not establish the full extent of the surviving remains. Additionally, as no elements of

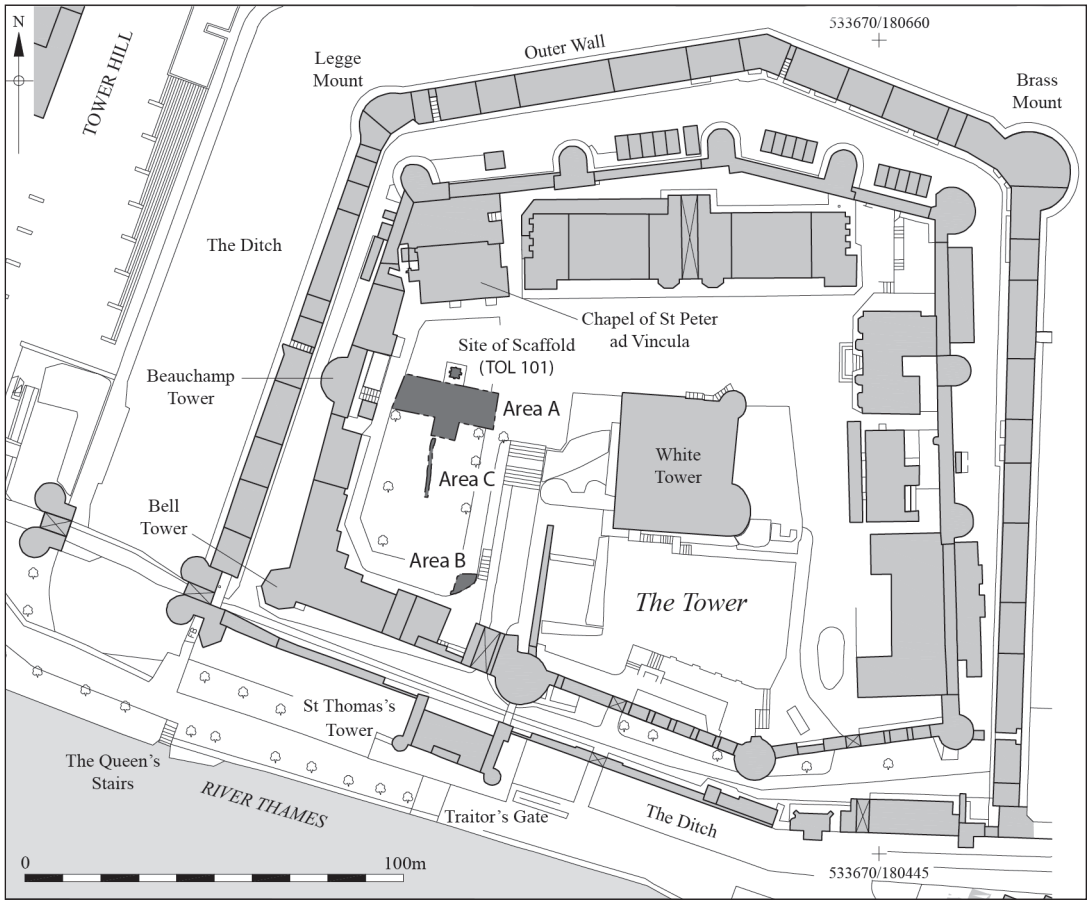

Fig 2. Detailed site location plan

masonry could be removed, it was often difficult to assign features to a precise phase and make definitive interpretations of the remains uncovered, especially to the west of the area of investigation where a complex structural history was revealed.

During the post-excavation analysis of this current work, it became apparent that there were problems concerning the location of the 1975 discoveries (Parnell 1979), as well as several inconsistencies between the original site records and the published plans. This paper discusses these problems and seeks to clarify the confusion.

GEOLOGY AND TOPOGRAPHY

The site is located on Tower Green, within the Inner Ward of the Tower of London. The Tower itself is situated on the northern bank of the River Thames overlooking the river.

The area of the study site occupies approximately 200m^2 and is generally flat with a gradual slope to the south. The current ground level at Area A is at a height of between *c.*10.74m and *c.*10.35m OD, the current ground level in Area B is at a height of approximately 9.52m OD, and the current ground level in Area C is between 10.34m and 9.85m OD.

The British Geological Survey North London map indicates that the site is likely to be underlain by Quaternary Post-diversionary Thames River Deposits, Taplow Gravel. However, due to the limited depth of the excavation (0.60m below the current ground level in Area A and 1.00m in Area C), natural geology was not reached.

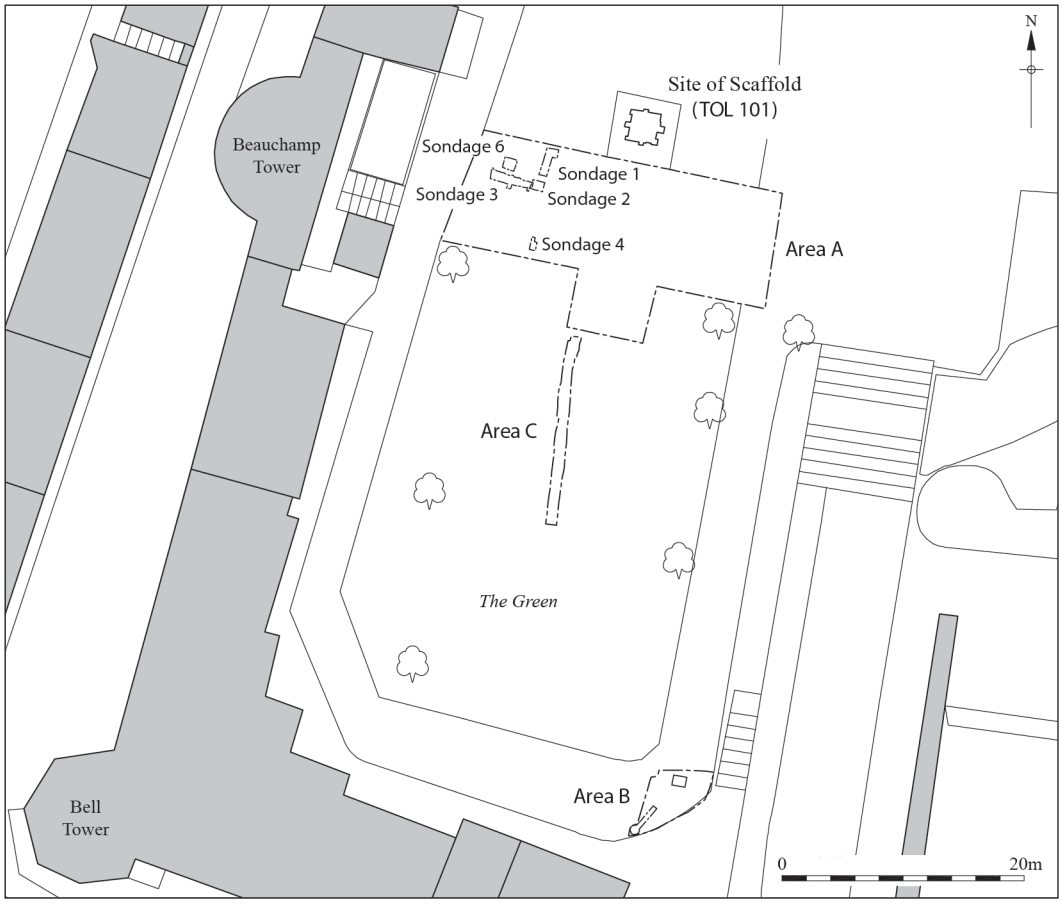

Fig 3. Detailed trench location plan

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

There have been numerous studies of the Tower of London (for example Charlton 1978; Allen Brown & Curnow 1984; Parnell 1982; 1985; 1993; Whipp 1980), and therefore only material relevant to the development of Tower Green is discussed here. Tower Green is located in the western quarter of the Inner Ward of the Tower of London and is perhaps most notable today as the execution site of, amongst others, Anne Boleyn (1536) and Lady Jane Grey (1554).

Medieval

The origins of the Tower of London lie in the aftermath of the Norman Conquest. In seeking to establish his authority over London, William the Conqueror established two fortresses within the western part of the walled city, known as Montfichet's Tower and Baynard's Castle, and a third one to the east known as the Tower of London (Watson 1992). The eastern fortress utilised the surviving Roman city and riverside walls as its eastern and southern outer defences. In *c.*1077 the construction of a stone keep known as the White Tower was begun, it now forms the core of the Tower of London (Parnell 1993, 17–23).

The next significant development of the defences of the Tower of London dates to the reign of Richard I (1189–1199). During this period the fortifications of the fortress were extended westward to encompass the positions occupied by the Bell and Beauchamp Towers

Fig 4. Area A looking east with White Tower in the background

(the latter is a 13th-century structure). Thus by the 1190s the southern half of Tower Green lay within the defences of the Tower (Parnell 1993, 24–6; Keevill 2006a, 3).

During the reign of Henry III (1216–1272), the Tower of London underwent further extensive alterations and expansions; it was not until *c.*1220 that the whole of the area that was to become Tower Green lay within the Inner Ward of the castle (Parnell 1993, 27–34; Keevill 2006a, 3). The Chapel of St Peter ad Vincula, which lies to the north of Tower Green, was formerly a parish church, first documented in 1128–34. It was encompassed by the new walls of the Tower built in the reign of Henry III and the building was greatly embellished by the end of 1240 (Parnell 1993, 33).

Post-medieval

During the early 16th century the area that was to become Tower Green was occupied by gardens and orchards attached to the residence for the Constable of the Tower of London (later known as The Queen's House), which lay at the south end of the Green (Keevill 2006a, 3). From the mid-16th century a series of maps depict Tower Green in some detail (see Discussion). All three 16th-century maps, Agas (*c.*1562–63), Braun and Hogenberg (1570) and Haiward and Gascoyne (1597) show a building occupying the central part of the Green (Figs 24, a–c). By the 17th century the maps of Hollar (1667) and Ogilby and Morgan (1676) show that a much larger L-shaped building now occupied the site (see Discussion). However, each of these two maps depicts a building of a different design; perhaps these discrepancies are due to artistic licence rather than reality (Figs 24, d–e). A Board of Ordnance plan of 1681–2 has a patch over the Tower Green area and would appear to show the buildings were planned to be demolished and the area to become vacant.

Thus a building in various forms occupied this location for over a century and it is documented that in the 1680s it housed the 'Old Main Guard' (Parnell 1979, 324, 326). This building, as its name implies, was used by the Yeoman Warders and soldiers based in the Tower as a guardroom (see Discussion). A report produced in 1682 examined the present state of the Tower and made recommendations for repairs and the strengthening of the defences. Part of the works recommended was 'for building of new maine Guard upon the Hill where the Old one is at present of 47 ft 2 inch long and 19 ft 7 inch broad, a brickwall round and the Old Roof to be sett upon the new Guardhouse with the taking down the Old wall will cost £120.4.8' (Parnell 1983c, 345). There was a delay in the building of the New Main Guard as part of the existing structure was still being used by the Office of Works. So it was not until 1685 that the Old Main Guard was demolished and replaced by a New Main Guard to the north-east of the previous structure on a site adjacent to the Waterloo Barracks, which was completed in that same year (Parnell 1983c, 349).

Two enclosed areas, adjacent to the east side of the structure on Tower Green, are shown on both the Hollar and Ogilby and Morgan maps, which most probably represent walled gardens (see Fig 24, d–e). A survey of 1717 by Lempriere shows the site of the Old Main Guard being used as a parade ground. A similar layout is shown on the Rocque Map of 1747. By the time of the first Ordnance Survey Map in 1873 the Green is largely covered by trees and the site of the execution block is depicted. By the time of the second Ordnance Survey Map in 1894–6 the trees have been removed.

During the 1860s, on the instructions of Queen Victoria, a memorial to the victims of execution was established on Tower Green. Over time, this memorial to those who met their end in the general vicinity has become, by tradition, the actual execution site (Watson 2006). The memorial itself has recently been renewed.

From at least the 18th century the area now occupied by Tower Green was a large open space, possibly cobbled (Keevill 2006b). By the 1870s the area was covered in irregular cobblestones, the surviving remains of which were relaid as part of the 2007 remedial works. It was not until the early 20th century that a lawn or 'green' was created and it is from this date that the site assumed its current form: a central paved area bisecting lawns to the north and south.

Archaeology at Tower Green

Tower Green has been the subject of limited archaeological investigation over the years. In 1975 a watching-brief was conducted on the excavation of a series of trenches for the insertion of fuel pipes for a new heating system. The investigation revealed structural remains associated with the Old Main Guard and walled gardens (Parnell 1979). Between 1993 and 1995 archaeological investigations in the area consisted of a geophysical survey of Tower Green (OAU 1995) and the monitoring of the construction of a new Electricity Inner Ring Main (Hiller & Keevill 1994). More recently the location of the execution site has been the subject of archaeological recording prior to the construction of a new monument which revealed a Victorian predecessor to the monument (Watson 2006).

THE ARCHAEOLOGICAL SEQUENCE

Late medieval to 16th-century structure (Phase 1)

The earliest structure encountered on site was a rectangular stone-built cellar, the internal faces of which were partially exposed in a series of small sondages excavated against its east, north and south walls (Figs 5–6). As exposed the cellar measured internally at least 4m east–west by 2.48m north–south by *c.*2.12m deep. The west wall of this structure was not revealed as it lay either outside the limits of excavation or below the formation level of the new surface of Tower Green as the western part of the area examined had been truncated by the excavation of a large service trench. The eastern wall, [28]/[35], was exposed within two sondages excavated to a depth of 1.2m against its western face (Fig 7). This wall was at least 0.32m wide and was solidly constructed with random use of a variety of materials including reused Reigate stone, Kentish ragstone and chalk blocks, as well as some reused late medieval yellow and pink bricks and peg tile, all bonded together

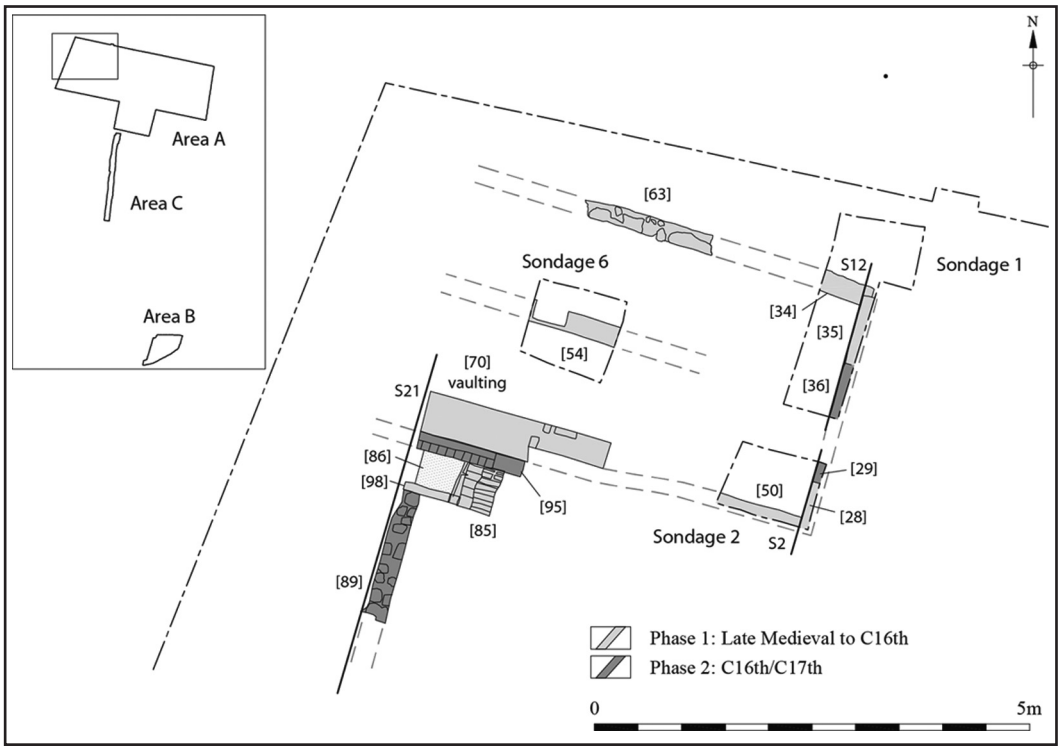

Fig 5. Late medieval to 16th/ 17th-century structures (Phases 1 and 2)

Fig 6. Area A showing area of stone cellar, west facing

with an off-white lime mortar (see Hayward below).

The south wall of the cellar, [50], was built in a broadly similar fashion to the eastern one; it was constructed from a range of materials, including some brick and peg tile, but principally from sandstone, limestone and chalk blocks. The northern wall was revealed as two separate elements, the eastern one, [34], and a 1.52m-long stretch of wall, [63], further west. It was constructed in a similar fashion to the other walls (Fig 5).

The limited size and depth of the sondages prevented any exposure of the cellar floor.

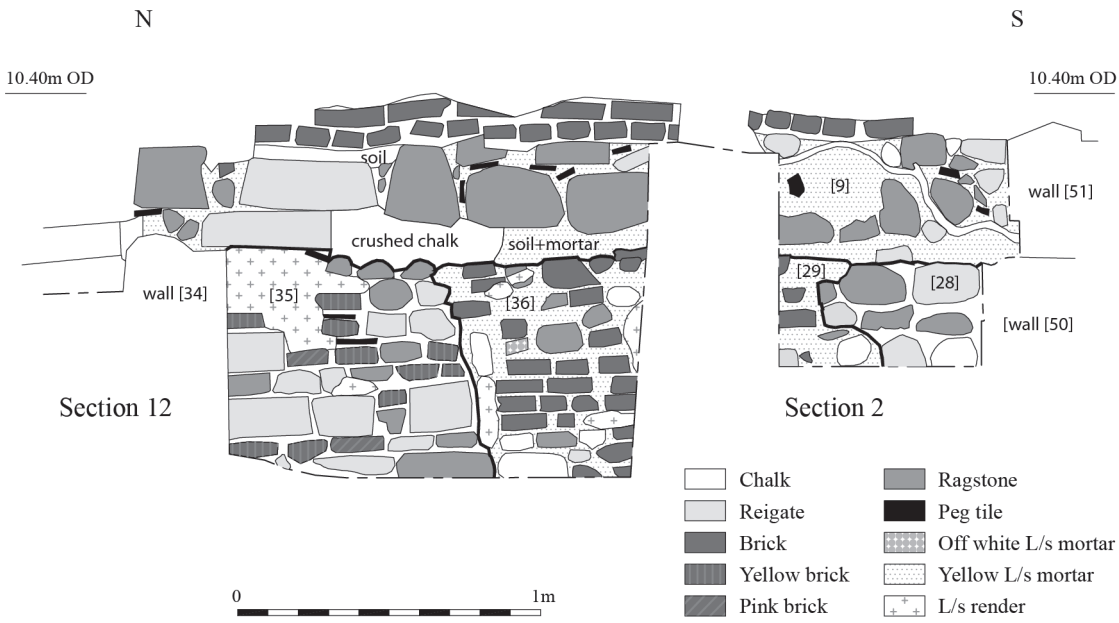

Fig 7. Sections 2 and 12 of blocked doorway [29]/[36] in stone cellar [28/[35] and overlying brick wall [9] (sections located on Fig 5)

Fig 8. Auguring within the cellar, east facing

However, two auger holes were hand drilled through the base of the sondage to ascertain the floor depth, and at 1.02m below the base of the sondages against the eastern wall, a solid surface was encountered which may be presumed to be the cellar floor (Fig 8).

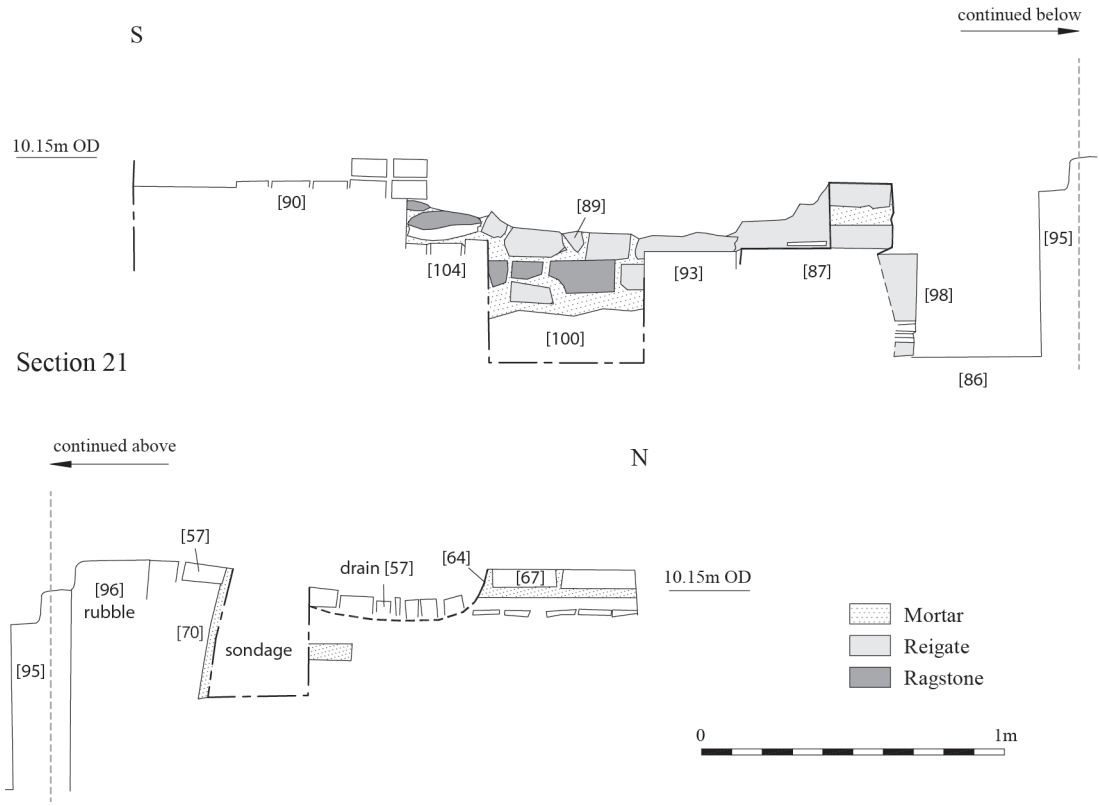

Fig 9. Section 21 across vaulted cellar [70] and complex masonry to south (section located on Fig 5)

Taking this information in conjunction with the previously exposed wall, the depth of the cellar may be estimated at *c.*2.12m.

Limited evidence of the internal layout of the cellar was exposed in a sondage to the west, where a narrow east–west-aligned brick wall, [54], was exposed (Fig 5). The wall may date to the late 15th/early 16th century and is interpreted as an internal partition wall of the cellar.

At the western end of the cellar was an area of masonry, [70], that appeared to curve outwards (Fig 9). At first sight this appeared to be an area of collapse; however further investigation showed this to probably represent the lowest courses of an east–west-aligned barrel vault. Both the stonework and brickwork were curved and tiered and the masonry was bonded together with lime mortar *in situ*, which would rule out the idea of a collapse. This is further supported by the presence of a thick (*c.*200mm) layer of mortar/render attached to the north face of the wall. It is therefore probable that this feature represents the remains of a brick barrel-vaulted ceiling. The bricks used in this vaulting are dated stylistically to 1480–1700, but as their fabric was more orange than that of the later bricks used in the Phase 3 building (see below), they have been assigned to this phase. In the western part of the study area a complicated series of masonry drainage features was revealed (Fig 10). The lowest feature observed in this series possessed a sloping Kentish ragstone flagstone lining, it is interpreted as the base of a drain, [86].

Overlying and associated with this flagstone lining was a well-constructed brick and stone lined drain, [85]. It was constructed from reused brick and stone forming a concave east–west channel. A large Reigate stone slab fronted the brickwork, and had a semi-circular central section tooled out, which served to channel water down to the base (Fig 11). This stone slab was reused and

Fig 10. Complex sequence of masonry to west of Area A, north facing

Fig 11. Channel with reused gun-port, east facing

has been interpreted as the lower half of a circular gun-port. A similar example exists *in situ* within the walls of the Bell Tower in the south-west corner of the defences of the Inner Ward of the Tower (J Spooner pers comm). The stone slab was placed over a shelly limestone and peg tile packing layer. A southern east–west wall, [98], formed of the same Reigate stone and shelly limestone, enclosed the drain on the south side. A later addition to this drain, [95], is attributed to Phase 2.

16th- or early 17th-century alterations and additions to the cellar (Phase 2)

Clearly the cellar and its associated drains underwent various later structural modifications, a number of which are attributed to either the 16th or early 17th century (Fig 5). One of these alterations was the rebuilding of the central portion of the eastern wall of the cellar, [29]/[36]. This new fabric was constructed from similar materials to those used in the earlier wall, except there was a greater usage of chalk and a preponderance of red brick (dated to 1480–1700) bonded by a yellow lime mortar (Fig 7). This new masonry would appear to represent the blocking of a probable doorway, which would suggest that either this cellar had possessed an external access or that undiscovered cellars may exist to the east.

To the south of the earlier drain, [98], a length of a north–south-aligned wall foundation was constructed, [89]. The west face of this wall had been truncated by a modern service trench. This wall was constructed from a mixture of Reigate stone, Kentish ragstone and reused yellow medieval brick. It overlay the lining walls of the drain, [98] and [85], but these two features may be broadly contemporary and both appear to predate Phase 3 activity. A brick and stone lining wall, [95], was added to the northern side of the earlier drain, [98].

Mid-17th-century Main Guard Building (Phase 3)

By the mid-17th century the cellar had gone out of use and was subsequently back-

filled with a series of silty sand deposits — interpreted as systematic infilling — observed in a series of sondages excavated within the former cellar (Fig 5). The date range of the ceramics recovered from these deposits shows that the cellar was backfilled soon after *c.*1650 (see Sudds & Jarrett below). The animal bones recovered from these deposits were dominated by cattle and sheep/goat, but also included a few game species (see Rielly below).

In Sondage 2, against the southern and eastern cellar walls, a sequence of six fills was encountered. Pottery recovered from the earliest fill, [24], is indicative of a mid-17th-century date, while finds from the penultimate fill, [20], have been securely dated to the mid-17th century; pottery from [20] dated to 1620–50 and clay tobacco pipes to 1640–60. Sealing the penultimate fill was a deposit of mortar, [19], encountered at a top height of 10.11m OD, which may represent a construction level.

In Sondage 1, against the northern and eastern cellar walls, a similar sequence of fills up to 1.13m thick was revealed, the top of which was encountered at a height of 10.23m OD. Two auger holes were hand drilled through the base of these deposits where a possible solid floor to the cellar was encountered at a height of 8.07m OD, which would suggest that the total thickness of the cellar fills was 2.16m. Pottery recovered from one of these deposits, [12], was dated to 1600–1650.

To the west in Sondage 6 a similar sequence of three fills was encountered. The earliest fill, [62], encountered was a mixed demolition deposit of lime mortar and brickearth, at least 0.25m thick. This was covered by a 0.10m-thick deposit of grey-brown sandy silt, [61], which in turn was sealed by a similar deposit, [60], containing frequent oyster shell and pebbles; the latter was up to 0.20m thick and was revealed at a top height of 9.98m OD.

Erected on top of the backfilled cellar was a building largely constructed from brick, but partly founded on reused blocks of Kentish ragstone and Reigate stone, with peg tile infill (Fig 12). The largest element of masonry of this structure consisted of a north–south wall, [9], measuring 3.17m long by 0.23m wide. This wall continued south on the same alignment, but was truncated by a large 19th-century tree-planting hole. The continuation of the wall, [52], extended to the southern limit of excavation for an additional 2.43m, which would give a total of 8.16m for the exposed length of the wall. The upper portion of the wall consisted of a maximum height of two courses of unfrogged brick (type 3033, see Hayward below) in a rather ramshackle English bond; it had a maximum height of 0.55m. The differences in mortar type and the accumulation of soil between the stone cellar and the overlying stone and brick foundation confirm that they represent two separate phases of building with the later walls partially respecting the design of the earlier cellar. It is possible that wall [9] was contemporary with blocking wall [36] and [29]. Pottery recovered from the soil infill of [9] was dated to 1550–1700.

Abutting wall [9] at its north end was a short stub of brick wall, [38], which formed an east–west return on its eastern side (Fig 12). The wall was truncated to the east by later activity. While similar in construction to [9], it appeared to be a later addition, as it overlay a brick built drain, [11]. However, it is possible that the drain was contemporary with wall [38] with the wall built over the drain maintaining an access for the drain outside the building. It is probable that this stub of wall together with the northern part of wall [9] formed a small entrance porch to the building.

Abutting wall [9] on its western side was brick wall [51], which was an east–west return constructed on top of the southern wall of the earlier stone cellar (Fig 13). This wall was almost certainly contemporary with [9] judging by its similarity in construction from reused bricks (Fig 14). Like [9], this wall was poorly built in an attempt at English bond, which degenerated into random coursing. Interestingly, like wall [9], this one was also partly constructed over cellar infill and partly respected the line of the earlier cellar walls [50]. However, no attempt appears to have been made to build directly on the underlying masonry.

To the east of wall [52] were the severely truncated remains of another north–south-aligned wall, [40]. Constructed from a mixture of fragments of unfrogged bricks, stone and chalk blocks, this wall had been

Fig 12. Mid- to late 17th-century buildings (Phase 3)

Fig 13. Section 14 showing relationship between stone cellar and brick building above and Section 17 stone cellar (sections located on Fig 12)

Fig 14. Brick drain [11] and east wall [9] of brick building, south facing

Fig 15. Remnants of tiled floor, south facing

severely truncated by a modern service trench and measured 2.00m in length by 0.30m wide. This service trench appears to be the one which was archaeologically investigated during 1975, and thus this wall should to be the same as one recorded by Parnell (1979). This wall ran parallel to walls [52]/[9] and most likely formed a corridor *c.*1.25m wide.

Running beneath the northern part of the corridor was a north–south-aligned brick built drain, [11], which survived for a length of 5.05m (Fig 14). Its northern end continued beyond the brick building and also beyond the northern limit of excavation of Area A; it was truncated at its southern end by a later tree-planting hole. Finds recovered from the backfill, [10], of the drain include pottery dated to 1580–1650. Levels taken in the base of the drain, 9.71m OD at the northern end and 9.93m OD at the southern end, would indicate a direction of flow to the north. A barrel vaulted brick structure was observed here during the 1970s investigation (see Discussion below); it would appear to be situated immediately to the north of the drain (Parnell 1979).

To the east of, and adjacent to the drain was a small surviving area of a floor surface, [13], consisting of square Flemish floor tiles measuring 119mm by 119mm and laid onto a sandy lime bedding mortar (Fig 12). Some of the tiles had a mid-greenish brown glazed surface (Fig 15). These were dated by fabric to 1300–1700 (see Hayward below), and appeared to be the surviving remains of the flooring within the northern part of the corridor which projected from the building as a porch and overlay the drain.

Abutting the western end of wall [51] was wall [69], which continued on the same east–west alignment, but was of a different build and had different levels of brick courses. It was either a repair or an extension to wall [51].

Running parallel with and lying to the north of the main northern wall, [51], of the building was a brick built gully, [57],

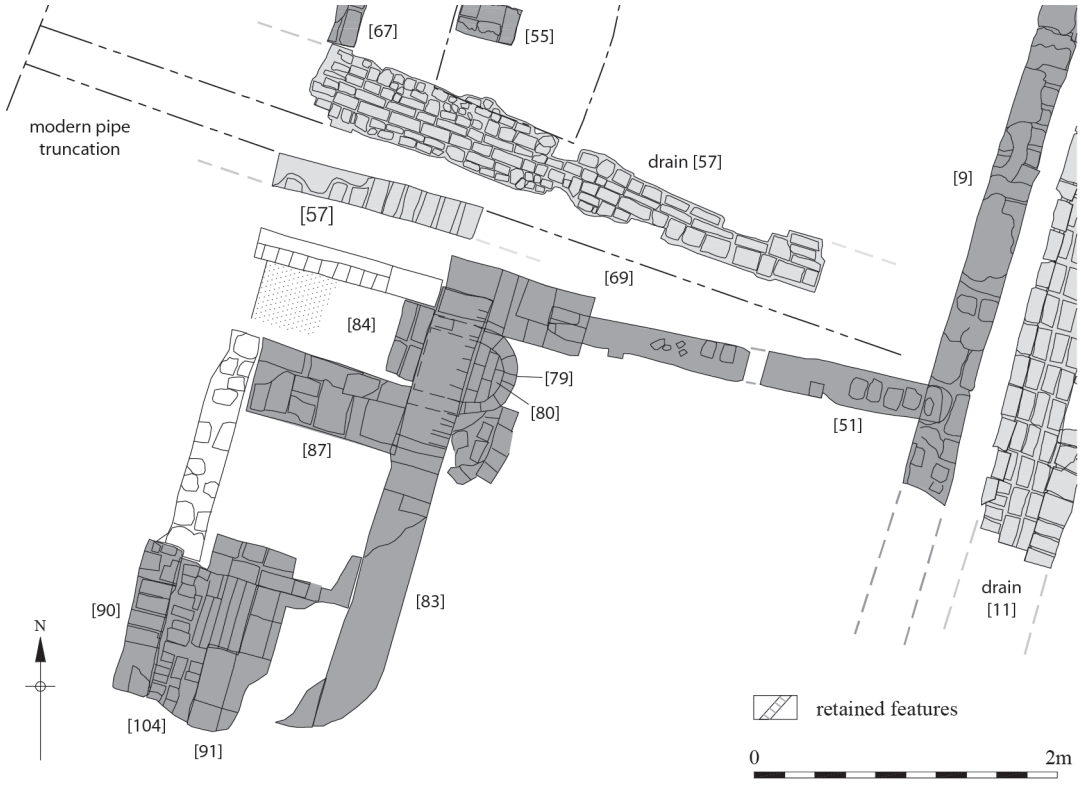

Fig 16. Detail of 17th-century masonry features

which was aligned east–west for a length of 3.50m and had been truncated by a modern service trench. This is presumed to be an external gutter or surface drain run-off, being a shallow V-shape, constructed of brick and perhaps originally inserted within an external yard surface. Remnants of a perhaps contemporary surface lay to the north; this consisted of the remains of a cobbled surface which had a shallow V-shape discernible suggesting another east–west-aligned surface run-off. It lay at the same height as the tiled floor of the corridor which might suggest that they were contemporary. To the south and within the internal area of the brick building was an isolated Yorkstone paving slab, which might represent the remains of an internal paved surface.

In the south-western corner of Area A to the south of wall [51] was a complex series of masonry features (Fig 16). They had been severely truncated on the western side by a modern service trench and a 19th-century tree-planting hole. Wall [87] was apparently built upon a layer of brickearth and was a later east–west return of earlier wall [89] (Fig 12). It was constructed from reused Kentish ragstone and Reigate stone with a peg tile levelling course. North–south-aligned wall [90], constructed from whole and fragments of unfrogged bricks, was truncated along its western face by a modern pipe trench. It capped earlier wall [89]. It is possible that walls [90] and [89] formed the western side of a passageway with wall [83], which was poorly constructed from brick surviving to a height of three courses, forming the eastern side. Abutting walls [89] and [90] was a possible brick built pier, [104]. Between the [104], [90] and [89] to the west and wall [83] to the east were the partial remains of a stone floor surface constructed from blocks of Reigate stone, [91], which may have formed the floor to the passageway (Fig 16).

Directly to the east of the earlier drain, [98]/[86]/[85], was a brick blocking wall,

Fig 17. Garden wall [1] with execution site and Chapel of St Peter ad Vincula in background, north facing

[84]. This wall truncated the drain and abutted wall [87] to the south and wall [95] to the north (Fig 12). Its purpose is uncertain. To the east of wall [83] was a semi-circular brick-lined feature, [79], perhaps a drain or soakaway.

Two fragments of wall to the north of the brick building may represent the foundations of small structures in the apparent exterior courtyard area. Exposed in a sondage which overlay the earlier cellar partition wall [54] was a rectangular brick built pier, [55] (Fig 12). This was a badly built structure, part keyed into the earlier wall below and part built over soil. It was apparently hollow and may have been designed to hold a timber post which supported a roof to the north of the main building. A similar form of construction, partly over earlier masonry and partly over soil, was evident in wall [51] and to a lesser extent in wall [9] (Fig 13). To the west were the truncated remains of a north–south-aligned brick stub wall, [67], truncated on its western side by a modern pipe trench. All the bricks used in these structures date stylistically to 1450–1700 (see Hayward below). This building was demolished in 1685 (see Discussion).

In the eastern part of Area A, a long section of north–south-aligned brick wall, [1], extending the full length of the trench, was exposed (Fig 17). This wall survived to at least six courses in height and extended for a length of at least 13m (Fig 12). Interestingly, this wall was better built and thicker (*c.*0.50m wide) than the foundations to the west. This wall has been interpreted as the foundations of a wall enclosing an area of formal garden to the east of the Old Main Guard building, depicted on Hollar's 1667 Survey and the Ogilby and Morgan Map of 1676 (Fig 24, d–e).

External dumping in Areas B and C (Phase 3)

Work in Areas B and C confirmed the extensive external dumping that is believed to cover much of the area of Tower Green (Fig 3). In Area C at least 1.10m of dumped deposits were revealed (Fig 18). Two layers of sandy mortar, [317] and [300], represent the dumping of demolition material. No finds were retrieved from these deposits but the overlying layer contained frequent lumps of iron slag representing furnace waste and pottery dated to 1550–1700. A single worked block of Reigate stone, [313], together with a thin strip of overlying mortar, [312]/[314], was observed in section and may represent the severely truncated remains of a structure or garden wall. Two small rectangular pits that were observed in the base of the sump trench were apparently cut from this level and suggest that this was once a ground surface. This was covered by a dump of demolition material, [310]. Further mixed dumps contained building material [308]/[309]; domestic refuse including frequent oyster shells [322] and industrial waste (iron slag) [321] sealed this layer. The layers were different in composition either side of a linear cut, [319], which contained pottery dating to 1500–1630. This feature may represent the remains of an east–west-aligned robbed out terrace wall foundation, which would explain the different sequence of deposits on each side of it. As most of these deposits were only recorded in section, little dating evidence was recovered.

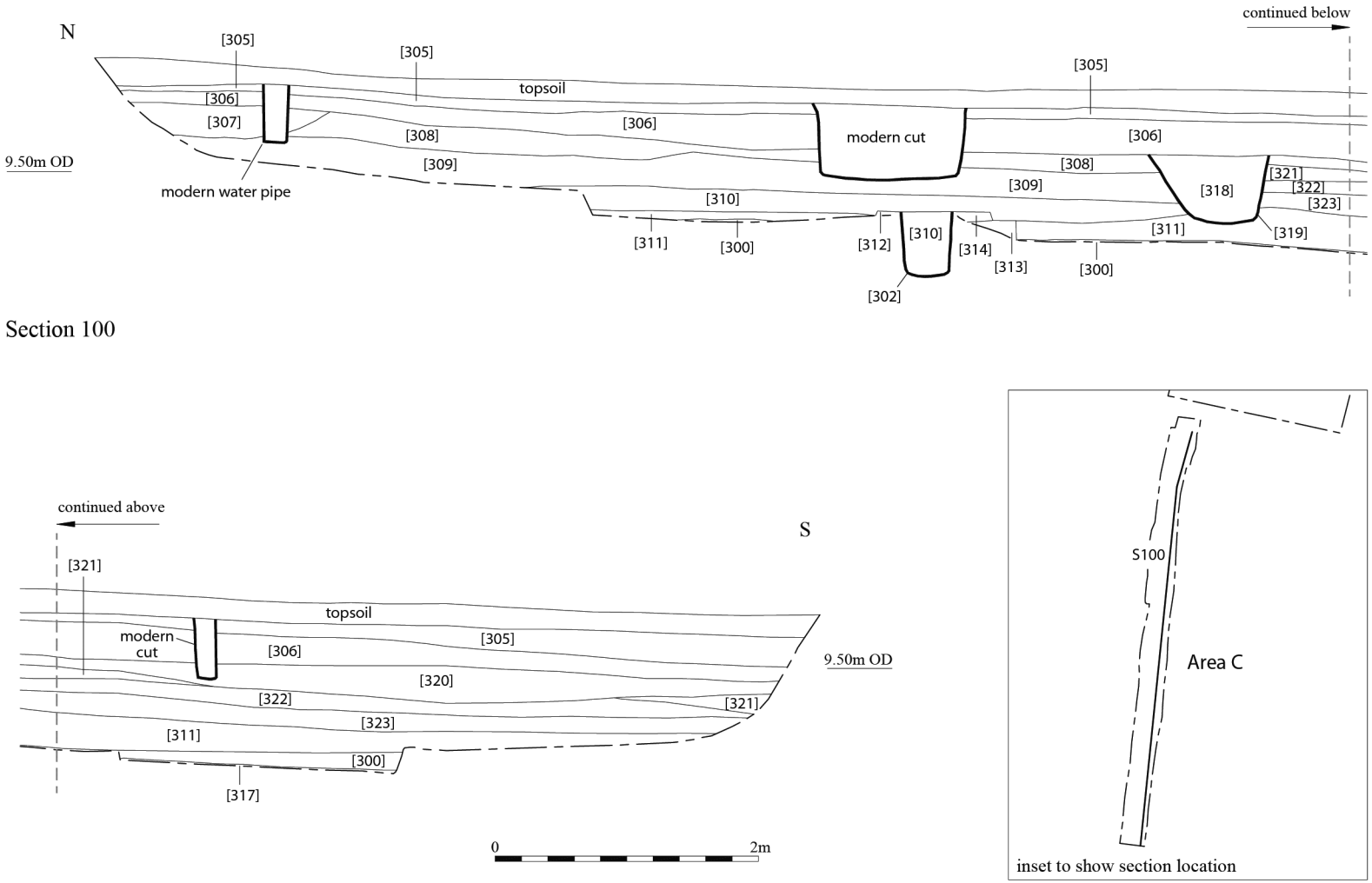

Fig 18. Section across dumped deposits in Area C

Late 17th-century activity (Phase 4)

Sealing all the deposits and structures across the entire site (including Areas B and C) was a thick layer of dumped soil. Pottery recovered from this deposit, [4], in Area A to the western side of garden wall [1] was dated to 1630–1700, and clay tobacco pipes to 1640–60. Whilst pottery from the eastern side of the wall was dated to 1630–80, and clay tobacco pipes to 1680–1710, confirming a late 17th-century date for these deposits (see Sudds & Jarrett below). Other finds from these deposits included curtain rings, a furniture handle, a rowell spur and a large ferrule (see Gaimster below). The animal bones from these deposits were dominated by the remains of young adult cattle (see Rielly below).

During this phase the dumping in Areas B and C continued. In Area C, finds recovered from the uppermost deposits [306] and [307] were dated by pottery to 1550–1650, and [308] to 1630–1800 (Fig 18). In Area B deposits [200] were dated by pottery to 1630–1680 and by clay tobacco pipes to 1660–1680.

Documentary evidence from a Royal Warrant dated 13 July 1682 concerning building work in the Tower referred to a 'new Guard on the hill' (Parnell 1979, 323). The Old Main Guard was demolished in 1685 and this dumping and levelling activity (including Areas B and C) is all believed to have taken place about the same time judging by the dating evidence recovered from these deposits. The source of the material used to carry out this dumping and levelling is not certain, but it may have been partly derived from the construction of the new Main Guard building.

19th-century remains

Three sub-circular cuts were observed truncating several of the earlier masonry features (not illus). It is probable that they represent 19th-century tree-planting holes, as the area is depicted on the First Ordnance Survey Map of 1873 as being covered by trees.

Modern

Various modern services were revealed across Area A, including a cut containing a disused lead water pipe aligned north–south, a cut for a modern water pipe, and a large pipe trench running north–south that truncated the eastern side of the 17th-century brick building (not illus). It was the excavation of the latter service run that was monitored in 1975 and which first revealed the masonry structures beneath Tower Green. A large service run along the western edge of Area A truncated all the archaeological remains on the western side of the building.

THE POST-MEDIEVAL POTTERY

Berni Sudds

Introduction

A total of 416 sherds, representing 253 separate vessels, was retrieved from excavations on Tower Green. The assemblage is almost exclusively dated to the late 16th to mid-17th century, with the remainder of the group comprised of a small quantity of medieval pottery and a single 19th-century sherd. With the exception of the fragmentary residual medieval material, the assemblage consists of large sherds in good condition. The two largest groups, accounting for half of the assemblage, were derived from the backfill of the cellar, [12] (Phase 3) and the Phase 4 external dumping, [4]. These last groups, in particular, demonstrate a number of complete profiles. Although largely redeposited, the assemblage provides a snap-shot of the sources of pottery supplying the Tower and the types of activity represented during the late 16th to mid-17th century. It is this material that forms the focus of discussion below.

The pottery

The post-medieval assemblage is quantified by source and fabric in Table 1 below. The ratio of local and regional products is fairly typical for the early post-medieval period in London. Local and regional utilitarian coarsewares, namely London redware and Surrey/Hampshire border ware together comprise nearly two thirds of the assemblage (Pearce 2007, 91). More notable is the relatively high proportion of imported pottery, accounting for 21% of the group by MNV (minimum vessel number). The

Table 1. Breakdown of the post-medieval pottery by source and fabric

Source	Fabric code	Common name	SC	MNV	Totals
Local pottery					
London	PMR	London area post-medieval redware	40	13	101 (56 MNV)
	PMRE	London area early post-medieval redware	12	6	
	PMSL	London area post-medieval slip-decorated redware	2	1	
	PMSR	London area post-medieval slipped redware	1	1	
	PMSRG	London area post-medieval slipped redware with green glaze	13	10	
	PMSRY	London area post-medieval slipped redware with clear glaze	33	25	
	TGW	English tin-glazed ware	11	10	32 (21 MNV)
	TGW A	English tin-glazed ware with Orton type A decoration (Wan li)	5	2	
	TGW C	English tin-glazed ware with Orton type C decoration (plain white glaze)	6	3	
	TGW D	English tin-glazed ware with Orton type D decoration (polychrome/ geomtr)	10	6	
Regional pottery					
Essex	METS	Metropolitan slipware	1	1	24 (15 MNV)
	PMFR	Post-medieval fine redware	19	10	
	PMFRB	Post-medieval fine redware with brown glaze	4	4	
Surrey / Hampshire	BORD	Surrey/ Hampshire border whiteware	4	4	138 (91 MNV)
	BORDB	Surrey/ Hampshire border whiteware with brown glaze	1	1	
	BORDG	Surrey/ Hampshire border whiteware with green glaze	38	25	
	BORDO	Surrey/ Hampshire border whiteware with olive glaze	4	3	
	BORDY	Surrey/ Hampshire border whiteware with clear (appearing yellow) glaze	78	51	
	BORD BICR	Surrey/ Hampshire border whiteware with bichrome decoration	2	2	
	EBORD	Early Surrey/ Hampshire border whiteware	3	2	
	RBOR	Surrey/ Hampshire border redware	8	3	
Midlands	MPUR	Midlands purple ware	26	3	26 (3 MNV)
Great Britain	ENGS BRST	English stoneware with Bristol glaze	1	1	1 (1 MNV)
Unsourced	XX	Unsourced	9	4	9 (4 MNV)
Imported pottery					
France	MART3	Martincamp-type ware type III flask (red earthenware)	12	1	13 (2 MNV)
	NORS?	Normandy stoneware	1	1	
Germany	FREC	Frechen stoneware	24	20	40 (33 MNV)
	FREC INSCR	Frechen stoneware inscribed band jug	3	2	
	FRECW	Frechen whiteware	1	1	
	GERW	German whiteware	2	2	
	KOLFREC	Cologne or Frechen stoneware	7	5	
	RAER	Raeren stoneware	1	1	
	SIEG	Siegburg stoneware	1	1	
	WEST	Westerwald stoneware	1	1	
Italy	LIGU	Ligurian berettino tin-glazed ware	2	2	3 (3 MNV)
	NIMS BICR	North Italian bichrome marbled slipware	1	1	
Low Countries	DUTR	Dutch red earthenware	8	8	9 (9 MNV)
	DUTSL	Dutch slipped red earthenware	1	1	
Spain	SPGR	Spanish green-glazed coarseware	1	1	1 (1 MNV)
Unsourced	XXIMP	Unsourced import	5	2	5 (2 MNV)

sources of origin for this material are not unusual, but although the assemblage is not large enough to be statistically reliable, the relative quantity is of some interest.

Local pottery

The local post-medieval pottery excavated at the Tower is primarily comprised of redwares with a smaller quantity of tin-glaze accounting for the remainder of the assemblage. The early and developed London-area post-medieval redware forms are restricted largely to food preparation and storage, namely cauldrons, pipkins, jars and deep bowls. A smaller number of dishes was also recovered, one decorated with an incised wavy line to the rim and a possible early post-medieval redware chamber pot (Fig 19.1); the latter has an unusual frilled footring base and may date to the late 16th or early 17th century. With the slipped redware the range of functions is more mixed with a variety of bowl and dish forms, a high proportion of jugs and only a handful of cauldrons or pipkins. Being more decorative, it is quite common to find a greater proportion of serving forms in this fabric. One deep bowl has an unusual collared, undercut and internally lid-seated rim (Fig 19.2). The rim of a fuming pot was also identified in slipped redware with green glaze (Fig 19.3).

As expected the tin-glaze assemblage also includes a high-proportion of decorative serving or display vessels in the form of bowls and dishes. The decoration is largely geometric given the date although Chinese influenced and fruit based designs are also evident. The only other tin-glazed form type identified, and present in nearly equal number in the assemblage, are pharmacy vessels. These include plain glazed ointment pots and storage jars or albarellos with painted geometric or cable designs. The limited and specialised range of forms is a reflection of both the early date and suitability of the fabric.

Regional pottery

The regional pottery assemblage is dominated by Surrey/Hampshire border wares with smaller quantities of material from Essex and the Midlands. The single sherd of English stoneware with Bristol glaze could have been produced at a number of centres across Britain but is out of place in the stratified sequence and is considered to represent contamination.

The Surrey/Hampshire border products are predominantly whitewares with either yellow, or slightly less frequently, green glaze. Much of the green glaze is mottled, suggesting an early date for many of the vessels. Bowl and dish forms occur most commonly, although tripod pipkins, skillets, porringers, chamber pots and a single drinking jug were also recovered. The dishes have broad flat rims, usually thickened above and below, and gently rounded bodies. More unusually the base sherd of one dish is incised with a random curvilinear design (Fig 19.4). The bowls have rounded or flared profiles and three are handled. Two of the latter may represent stool pans and are also decorated with incised semi-circular designs on their everted rims (Fig 19.5). The tripod pipkins generally have internally lid-seated rims, although two with external lid-seating, dating from the mid-17th century, were also identified. The few porringers recovered were carinated and the single skillet flared.

A few sherds of residual Early Border whiteware and an equally small number of Border redware vessels, including a tripod pipkin, account for the remaining products from the Surrey area.

The pottery from Essex includes a Metropolitan slipware rounded bowl and a small quantity of post-medieval fine redwares. The latter group produced a few diagnostic sherds, including those from a jug, a porringer and a rounded skillet (Fig 19.6). A small number of brown glazed, thin-walled post-medieval fine redwares were found scattered between more than one context. These may derive from the same mug or drinking vessel. Finally, the Midlands purple ware is represented by two unspecified jar forms and a possible butterpot.

One of the unsourced vessels, a non-local redware deep flared bowl with an everted, thickened rim and thumbed neck, may represent a regional import (Fig 19.7). The form cannot be paralleled in the London repertoire and the fabric, an even sand-tempered body with fine organic inclusions, remains unsourced.

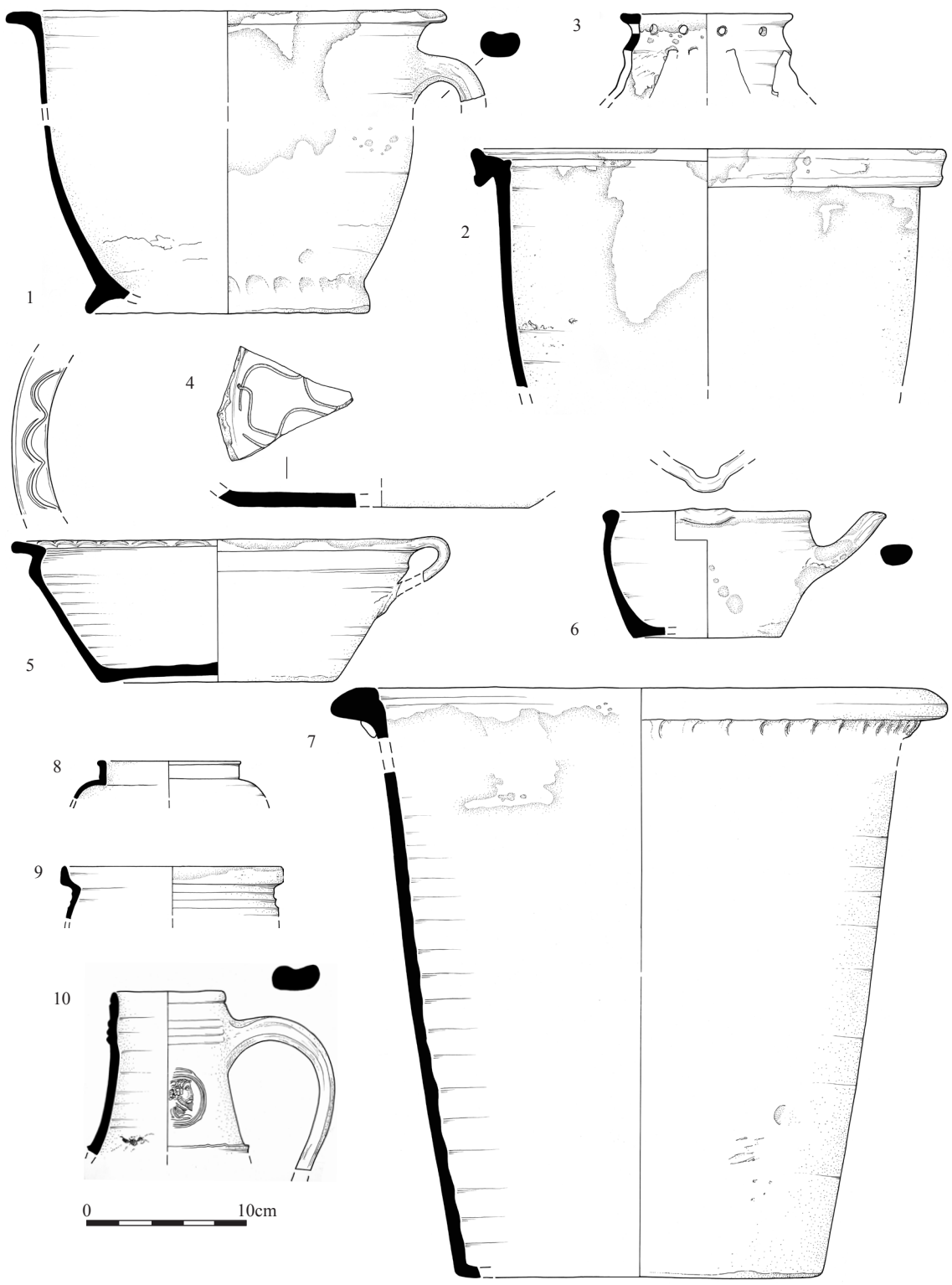

Fig 19. Ceramics from Tower Green: 1. PMRE chamber pot [4]; 2. PMSJ bowl [12]; 3. PMSRG fuming pot [10]; 4. BORDG dish [18]; 5. BORDG stool pan? [12]; 6. METS skillet [18]/ [20]; 7. Unsourced redware deep bowl [10]/ [12]/ [42]; 8. NORS? Jar [56]; 9. GERW jar [9]; 10. FREC INSCR jug [12]

Imported pottery

The majority of the imported assemblage originates from Germany and of that group, as on other sites across London during the late 16th and 17th century, the greatest quantity derives from Frechen (Pearce 2007, 93). Indeed, none of the other fabrics identified represent unusual finds, but the relative proportion of imports to local and regional products and the diversity within the group is of interest.

The stoneware forms are almost exclusively drinking vessels or containers. The group includes two early Siegburg and Raeren drinking jugs, three Frechen inscribed band jugs of varying size dating to the late 16th century, and the ubiquitous *Bartmannkrug*. The partial mottos on the inscribed band jugs are a little difficult to decipher but have characters in retrograde and do not appear to make sense. They read '… [E]IN:ZEK: WAN…' and '…N:ZIL:W W…' with the Z's in retrograde on both. On legible examples the mottos often refer to God and drinking but many are nonsensical indicating that the potters may have been illiterate (Hurst *et al* 1986, 215–19). The *Bartmannkrug* include a near complete example with a double fleur-de-lys medallion. A small number of Cologne or Frechen products and a single Westerwald vessel were also identified.

Fragments of a possible single Normandy stoneware jar were also recovered (Fig 19.8) and the neck and body of a Martincamp ware type III globular flask dated to the first half of the 17th century. The Normandy stoneware jar rim is unusually fine and another source remains possible for this vessel. The two sherds of German whiteware are non-diagnostic, although one represents part of the lid-seated rim of a jar-type form (Fig 19.9). Typically the Italian marbled slipware and Ligurian berettino are represented by decorative bowls and dishes. Of the two Ligurian bowls one is fluted and both appear to demonstrate '*a quartieri*' designs internally (Milanese 1993, 29–30).

The remaining imports comprised a small group of Dutch red earthenware and slipped red earthenware and a single Spanish green-glazed coarseware.

Distribution and dating

The pottery recovered derives almost entirely from backfill, demolition and made ground deposits. The largest assemblage (148 sherds) was collected from the backfill ([12], [20], [24]) of the stone-walled cellar. The group contains a few late 16th-century vessels, including early post-medieval redware, decorated Surrey/Hampshire border ware bowls and a large Frechen jug with a portrait medallion (Fig 19.10), in addition to a significant quantity of pottery pre-dating 1650, namely Dutch redware, post-medieval slipped redware, a Martincamp ware type III globular flask and Spanish green-glazed coarseware. The presence of Surrey/Hampshire border ware with brown glaze post-dating 1620 and a Surrey/Hampshire border ware plain tripod pipkin with an externally lid-seated rim, however, suggests deposition occurred during the mid-17th century, probably just after *c.*1650 (Pearce 1992, 19).

The other large group (104 sherds) derived from made ground ([4]) relating to the subsequent phase. As with the cellar backfill, this contained a significant proportion of late 16th-century material, including a Frechen inscribed band jug, early post-medieval redware, post-medieval slip-decorated redware and Raeren stoneware. The layer also contained early to mid-17th-century material, including post-medieval slipped redware, Dutch redware, a Metropolitan slipware rounded bowl post-dating 1630, and a tin-glazed dish decorated with a pin-wheel motif dated *c.*1620–1640 (Archer 1997, A4; Blackmore 2006, 80–1).

Indeed, with the exception of a few earlier and later sherds, the dating is very similar for the entire assemblage. The earliest deposits contain pottery dating from the late 16th to early 17th century, including German whiteware, post-medieval slipped redware, Dutch redwares and tin-glaze ([9] and [27]). The freshness of the late 16th-century material, particularly within the cellar, would perhaps suggest that much was old when deposited and not residual.

Discussion

In addition to dating evidence for individual contexts the pottery, despite being largely

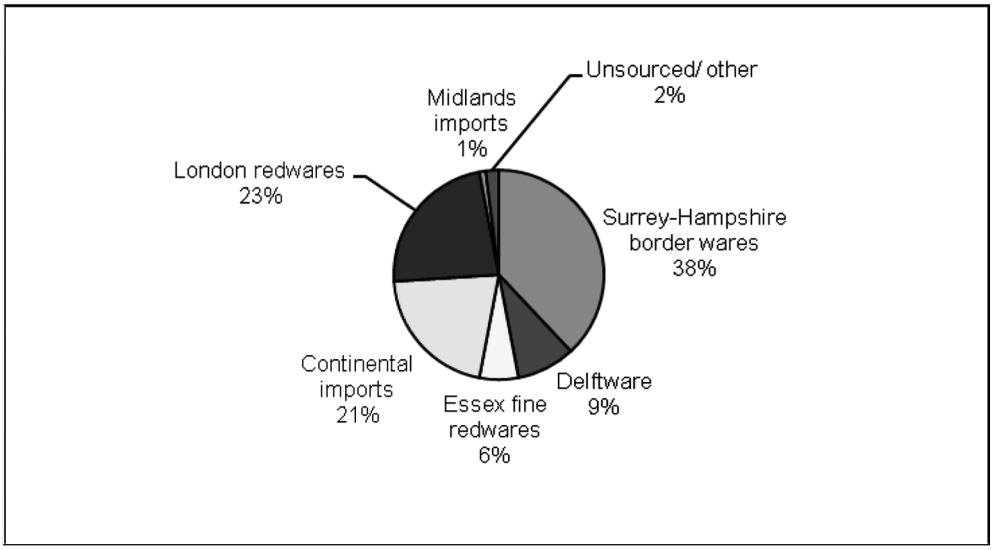

Fig 20. Breakdown of pottery by major source (by minimum vessel count)

redeposited in backfill and made ground, provides background information about ceramic consumption at the Tower during the late 16th to mid-17th century. A breakdown of the pottery by major source is presented in Fig 20. As paralleled elsewhere in London, the assemblage is dominated by local and regional utilitarian coarsewares (Pearce 2007, 91) but the breakdown by source is slightly more unusual for the period and the percentage of imported pottery is relatively high. Contemporary assemblages, such as Magdalen Street in Southwark, are typically dominated by local redwares and Surrey/Hampshire border wares with tin-glaze products representing the third most common group followed by continental imports (Pearce 2007, 96). At the Tower the Surrey/Hampshire border wares represent the most common pottery type at 38% followed by London redwares and continental imports in roughly equal proportion (23% and 21% respectively) with delft comprising just 9%.

The relative proportion of fabrics observed on sites in London can vary geographically. Those close to the river front, for example, sometimes produce inflated quantities of delftware through the presence of production waste (Pearce 2007, 91). Although located adjacent to the river, this is evidently not the case at the Tower where the delftware has a relatively small presence, but then dumps of wasters would not be expected in this location. Chronology also influences the varying proportions, with the low quantity of delftware at the Tower more likely a reflection of the early date. Indeed, although deposited in the mid-17th century, much of assemblage dates to the late 16th century and early 17th century before the main *flourit* of this ware.

The dominance of Surrey/Hampshire border ware, present in almost double the quantity of the local redwares, is also interesting and may reflect the status or purchasing power of the Tower where the finer whitewares were selected over the coarse redwares. The relatively high percentage of imports is also notable, perhaps for a similar reason. Excavations on a number of sites in the Tower Hill area and in the Tower Moat have similarly produced a relatively broad range of imported pottery (Blackmore 1996; Brown & Thomson 2004). At Tower Hill this was suggested to be the result of mercantile activity, due to proximity to the waterfront and more specifically the landing points for foreign ships at Custom House, Wool Key and Galley Key (Blackmore 1996). In the same way the location, but also the status, of the Tower would have meant it was well placed to receive a steady supply of imports.

The range of imported pottery includes a few rarer types, including the Ligurian berettino bowls, but otherwise is quite typical in contrast to the assemblages excavated at Bombay Wharf in Rotherhithe (Pearce 2007) and Narrow Street in Limehouse (Jarrett 2005) where, in spite of the Navigation Acts and monopoly of English pottery manufacturers, a broad range of exotic pottery, including significant quantities of imported delftware, was found. The presence of this material on these sites has been attributed to the activities of mariners and privateers, primarily as private possessions (Pearce 2007; Jarrett 2005). The range of imports at the Tower is altogether more typical of that found across London, representing a cross-section of the material coming in as trade.

An analysis of the pottery by functional group also reveals a fairly typical breakdown for domestic assemblages in London during the 17th century (Pearce 2007, 91–2). Vessels used for the preparation, cooking and serving of food represent the most common type, accounting for over half of the identified forms (61%), followed by drink-serving forms (22%). Bowl and dish forms dominate the kitchen and serving category and tripod pipkin and cauldrons the cooking class. Storage and transport forms, including jars and a butter pot, account for 7%. Serving and display vessels, personal drink consumption containers, pharmaceutical vessels and sanitary forms each account for 3% or less.

As redeposited it is clear that the assemblage is not necessarily directly related to the Old Main Guard but could have originated from one or a number of different locations within the Tower. This may explain why some higher status vessels are present that would not otherwise be associated with the guards but perhaps with more important incumbents at the Tower, whether high ranking staff, guests at the palace or high-status prisoners.

THE CLAY TOBACCO PIPES

Chris Jarrett

Introduction

A small assemblage of clay tobacco pipes was recovered from the excavation. The material is fragmentary, but bowl forms were identifiable and were mostly deposited soon after breakage. There are 79 fragments (7 being unstratified), consisting of 32 bowls, 46 stems and one nib or mouthpiece. The clay tobacco pipe bowls date to 1610–1710 and were classified according to Atkinson and Oswald (1969); Oswald's (1975) Southern England typology was also used to classify one bowl.

The clay tobacco pipes

The earliest bowl recovered from the excavation was a single damaged, spurred AO6 form, dated 1610–40; it has a fair quality finish (trimming, wiping and burnishing). An obvious non-local bowl is a Southern England type 1 bowl (S1), dated 1620–40 and characterised by an overhang to the front of the bowl and a heart-shaped heel (Fig 21.1). It has full milling of the rim and an excellent quality finish, but was unstratified. There are only two bowls dated 1640–60 and these are both the heeled AO10 type. Both examples have full milling and a good finish, indicating good quality items, but one bowl additionally has a rouletted line around the circumference of the stem (Fig 21.2).

The number and range of bowl types dated 1660–80 notably increases compared to the earlier types. There are four AO13 bowls, but one is only identified by its surviving heel, while the rims of two other examples are damaged. The most complete example is a broader variant (Fig 21.3); it only has a quarter milling but a good quality finish. The spurred bowls of this period occur as two AO15 types; they have three quarter to full milling and are of a fair finish, but one bowl is a taller variant. The straight-sided, heeled AO18 bowls are the most numerous for this period with ten examples; they have quarter to full milling of the rim and a fair finish. Barrel-shaped and taller variants are also represented amongst this class of pipe.

The larger 1680–1710 heeled bowls are represented by ten examples, two of which can be classified as the AO20 type with rounded profiles; these have half to three quarter milling of the rim and a fair or good quality finish. One bowl is a shorter variant. More numerous are the straight-sided AO22 bowls with eight examples. These bowls have a quarter to half milling and are of a fair to

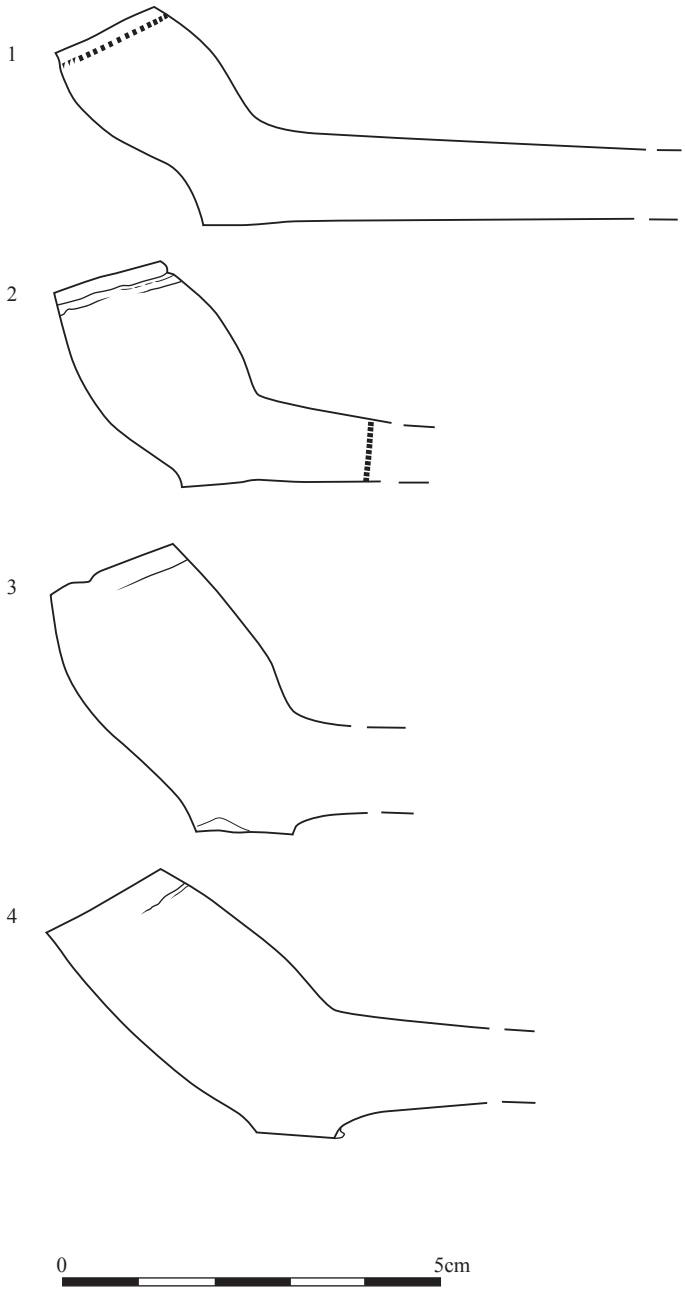

Fig 21. Clay tobacco pipe bowls from Tower Green: 1. Type S1 [unstratified]; 2. AO 10 [4]; 3. AO 13 [200]; 4. AO 18 [56]

good quality finish. A number of variants are present amongst the AO22 bowls, including one intermediate in size with the predecessor AO18 type; this example has an acute angled bowl (Fig 21.4).

Distribution

The earliest occurrence of clay tobacco pipes occurs in Phase 3, Area A and in back-fills of the cellar [28]/[35]/[50]. Backfill [20] produced two bowls, a spurred AO6 and

a heeled AO10, the latter indicating deposition *c.*1640–60. In Phase 4, one of the Area A dump layers, [56], contained a tall AO15 bowl and the noticeably angled AO22 bowl (Fig 21.4) indicating deposition *c.*1680–1710. The levelling layer [46] produced three 1660–80 dated AO18 bowls, two with barrel-shape profiles and a third an oversized variant. Sealing this phase of activity was a dump layer, [4], to the west of wall [1]; this deposit has recorded a residual AO10 bowl with milling around the stem. Layer [200] in Area B was the equivalent of deposit [4] and produced nine bowls all dated 1660–80, three AO13 examples (Fig 21.3), a single AO15 and five AO18 bowls. The made ground [3] to the east of wall [1] produced the largest quantity of bowls from the excavation, eleven examples ranging in date from 1660 to 1680; the latest types, which were mostly damaged, were two AO20 bowls and six AO22 bowls. Only widely dated stems were recovered from a deposit in Phase 4, Area C and Phase 5, Area A.

Discussion

The clay tobacco pipes from this excavation are probably derived from activity within the Tower of London. However, the pipes were derived from back filling and levelling deposits, rather than from stratigraphy directly associated with habitation and use of the Old Main Guard building. It is therefore difficult to assume that these pipes belonged to the sector of the Tower of London community who were concerned with its security; they may reflect more of the wider environs or the builders and workers who built and demolished these buildings or carried out landscaping. The quality of the pipes is variable, ranging from a poor finish to bowls completely milled and nicely burnished, but none of the bowls are maker marked, which is suggested as evidence for better quality, more expensive clay tobacco pipes. However, the assemblage predominantly dates to the mid- to late 17th century and coincides with the period in London when makers' marks are relatively rare, before the practice started to be resumed from *c.*1680, becoming much more common place in the 18th century. It could be speculated therefore that the clay tobacco pipe assemblage here reflects mostly the lower socio-economic element of the Tower of London inhabitants, with a small number of more affluent workers' pipes also present. The Southern England bowl may represent a visitor to the Tower, or someone from that area being employed there.

The assemblage also indicates something of the regional character of the London clay tobacco pipe industry. The distribution of different types of mid-17th-century clay tobacco pipes shows that the straight sided AO18 bowls are much more common in East London (Jarrett forthcoming). This indicates that if the Tower of London quarter master included clay tobacco pipes amongst their ordnance then they were sourcing locally. Or if individuals bought their own pipes and tobacco, then they were doing the same. The predominance of the AO22 bowls (which developed from the AO18 bowls) in the assemblage reflects the fact that this was the main type of bowl found across most of London and regionalism in the industry was disappearing at this time.

Other, larger clay tobacco pipe assemblages have also been excavated from the Tower of London. Material from Edward VI's Bulwark was notable for a sizeable group of pipes from pit [88], deposited *c.*1660–70, with the main bowl types being the AO15 (poorly represented on the Old Main Guard site) and AO18s. Three of the latter pipes, and possibly one of the AO15 bowls, had been marked by the owner (not the maker) with the initial B in a red pigment: an extremely rare find for London (Nelson 1996, 133; Nelson & Higgins 1996, 133–4). A large assemblage of clay tobacco pipes was recovered from the excavation of the moat and these were important for redefining the late 18th- and 19th-century London typology (but not represented at TOL 103), but that assemblage also included a small number of non-local and imported bowls (4%). Very notable was a bowl made by James Hunt in the Bristol and Bath area *c.*1660–90 (Higgins 2004). The S1 bowl from the Old Main Guard building complements the James Hunt bowl in that it demonstrates that non-local pipes were present at the Tower, perhaps for a number of reasons, but in very small numbers and so were not in everyday use there (Higgins 2004, 242). The pipe assemblage therefore probably represents a smoking community native mostly to London.

CERAMIC AND STONE BUILDING MATERIAL

Kevin Hayward

Introduction

A review of the building material used in the construction and rebuilding of the 16th- to 17th-century Old Main Guard is based mainly on *in situ* recording of the walling and flooring from Area A. Sampling was not permitted from the standing structures as the Tower of London is a World Heritage Site and Scheduled Ancient Monument.

This section concentrates first on the fabric and form of the *in-situ* ceramic building material (brick, roofing and floor tile). This is followed by a geological overview of the worked stone and rubble used in the walls. Supplementing this, is the information provided from a small assemblage (133 examples, 55kg) of loose building material retained not only from this part of Tower Green (TOL 103) but also from the watching-briefs to the south-east (Area B) and south (Area C) of Area A where quantities of dumped building material were recovered (Watson 2008). These findings are brought together in a conclusion, which assesses the use of building material during the first three phases of activity on site.

Methodology

Restricted access to the *in-situ* walling sometimes made accurate on-site observation and recording of the building material difficult. Nevertheless, it was still possible to document and measure the fabric and form of each material type on a context sheet.

The fabric of the retained loose stone and ceramic building material was examined using a long arm stereomicroscope (x20) and then compared with the in-house PCA building material reference collection to provide an exact match. The codes assigned to a building material fabric are based on the Museum of London fabric classification.

Brick

Medieval fabric (3031; 3042)

The availability of small (160mm) and narrow (40mm) yellow 3031 (1350–1450) and swirly pink 3042 (1400–1600) medieval construction bricks for reuse in the walling [35] of the late 16th-century stone cellar and related masonry [89] was to be expected and attributable to earlier medieval building programmes in and around the Tower of London. Quantities were small, however, and reflect a preference for stone as a walling material during the medieval period.

Post-medieval fabric (3033; 3032nr3033; 3032)

The use and reuse of red 3033 (1450–1700) 'Tudor Bricks' in the walling of the Old Main Guard was widespread particularly during the Phase 3 rebuild. These bricks are much larger (220mm) and wider (110mm) than their medieval antecedents, but are poorly made, having an uneven base and a sunken margin. The earliest bricks have a hard pink-red fabric and can be very narrow (40mm), *eg* [54], developing later on into thicker (60mm) sandier, orange bricks, *eg* [55].

Post-Great Fire maroon 3032nr3033 (1664–1725) bricks on the other hand are very rare occurring only in later walls, [83]. The under-representation of this fabric in the walling of the Old Main Guard is easy to explain. Its demolition in 1685, following its relocation to the north-east, occurs just 20 years after these bricks were first manufactured.

Glazed floor tile (fabric 2497)

In-situ floor tiles from the Old Main Guard are represented by the re-use of a black glazed Flemish fabric 2497 (1300–1550) in some mid- to late 17th-century flooring, [13]. The dimensions (180 x 180 x 26mm) are not untypical of a 16th-century date.

Stone building material

Variety and geological source

A variety of rock-types were incorporated as ashlar and rubble into the walling of both the Phase 1 cellar and to a lesser extent the Phase 3 rebuilding. They consist of an admixture of poor quality, local materials (Kentish ragstone 3105; Hassock stone 3106; Chalk 3116; Flint 3117) and better quality reused freestone[1]

[1] Soft even-grained limestones or sandstones with an open porous texture which enable the rock to be worked or carved in any direction (Sutherland 2003).

materials (Caen stone 3119; Reigate stone 3107; Shelly Purbeck limestone 'featherbed' 3126). Add to this a further three rock-types, Purbeck marble 3112, York stone and a type of Malmstone 3120 identified from the loose rubble, then this number increases to ten. This was to be expected given the draw that a major building programme, such as the Tower of London would have had on native and continental stone resources. The variety of rock-types encountered in other excavations associated with the Tower of London such as the Moat (Keevill 2004) bears this out.

The Lower Cretaceous Greensand outcrops of west Kent and east Surrey provide by far the largest proportion of the building stone in the cellar walling. Given that these soft light green glauconitic (Reigate stone) and hard grey calcareous (Kentish ragstone) sandstones are very common elsewhere in the Tower (Keevill 2004), it seems more likely that these materials were acquired from a ready stockpile of used stone rather than as a freshly quarried consignment. The reuse, for example, of a large semi-circular Reigate stone slab, interpreted as the lower half of a circular gun-port, into a well-constructed stone gully [85] to the west of the cellar bears this out.

The finer limestone materials identified as Purbeck 'marble' and stone ('featherbed') from Dorset and the fine yellow pelletal packstone (Caen stone) from Normandy would have also been recycled. Each material has been identified from earlier construction phases in other excavations at the Tower (*eg* Keevill 2004). For example, the unusual very shelly 'featherbed' paving identified in the walling of the Phase 1 drain area has also been identified in the 13th-century causeway on the Thames edge (Keevill 2004).

Indeed the quarrying and supply of Purbeck marble to the Tower of London, as documented in a writ of 1239 (Keevill 2004, 67), seems to be interlinked with the use of this shelly limestone. Both materials are found in the same Upper Jurassic cliffs of the Isle of Purbeck and would probably have been exported from Poole Harbour to London (Keevill 2004, 99).

Conclusion

The existence of the Old Main Guard at Tower Green between at least 1562 and 1680 was known from historic cartographic sources. Stratigraphic evidence from the recent excavations has now made it possible to subdivide the sequence into four phases of development: construction, alteration, rebuild and demolition. The form and fabric of building material in each is considered.

Phase 1: late medieval to 16th-century cellar

This initial phase is marked by the near-exclusive use of recycled stone in the external walls [28], [35], [50] and [34] of the rectangular cellar and in the masonry drainage features to the west of it. Randomly coursed ashlar blocks, rubble, paving and reused mouldings of local chalk, flint, Reigate stone, Kentish ragstone, and Purbeck limestone 'featherbed' were all present. All of these materials have been identified in earlier medieval constructions around the Tower (Keevill 2004) and it would have made economical and practical sense to incorporate a ready stockpile of used stone into the cellar walls, rather than bring in a consignment of freshly made red bricks or stone. Indeed the only bricks identified within these structures are the much smaller medieval white and very early post-medieval pink types. It is only in the internal walling [54] and brick barrelled roof vaulting [70] of the cellar that red bricks (1450–1700) are first used. These early forms are much harder and pinker than their later sandy-orange post-medieval counterparts and are also much thinner (40mm).

Phase 2: 16th/17th-century cellar alterations

On the basis of fabric and form it is not easy to make a distinction between the brick and stone used to block the cellar walls [29] and [36] and those from the earlier cellar itself. Both use recycled stone and red brick similar to that of the internal wall [54]. These alterations may have been carried out soon after the internal walls of the cellar were built.

Phase 3: mid-17th-century rebuild

The Phase 2 building was demolished soon after *c.*1650, and a new one completed before 1667 (see Discussion). The form and fabric of the materials used in this new

building and the contemporary garden wall differ from those used in the previous phases in a number of ways. There was a preference for using just red bricks (1450–1700) rather than just stone or a mixture of both. The bricks used tended to be thicker (55–60mm) [9], wider (110–120mm) [83] and sandier than their Phase 1 counterparts. On the other hand, it is not so easy to explain the presence of English bonding in these walls, [9] [51], as this type of coursing generally went out of use in the early 17th century (Brunskill 1990). The bricks used in pier [63] were generally thicker and better made than those used in other features.

THE METALWORK AND SMALL FINDS

Märit Gaimster

The excavations at Tower Green produced a number of metal and small finds associated with the building remains identified as the Old Main Guard. The finds discussed here all come from 17th-century contexts (Phases 3 and 4) where they represent a range of categories, including household furnishings and cutlery, dress accessories, and objects with a military association. A full listing of the finds can be found in the site assessment report (Gaimster 2008). In addition, two finds recovered during smaller investigations of the execution scaffold are also included here (site code TOL101).

Four flat-section rings of copper alloy represent a well-known category of household fittings (sf 3, 8, 15, 17), associated with the hanging of curtains and wall coverings (Margeson 1993, 82). A T-shaped brass drop handle is likely to come from the side of a chest or coffer, designed for lifting (Fig 22.1). A heavily corroded knife with flat, tapering ivory scale handle appears to have a simple rounded end with a metal end cap (sf 7); parallels can be seen in slightly earlier handles of a type furnished with a hole for suspension (*cf* Cunningham & Drury 1985, fig 32, 26–7; Egan 2005, fig 72, 348). Some finds, unsurprisingly, reflect the military aspect of the Tower. This is most clearly seen in an iron cannon ball (sf 18), but a substantial pointed iron ferrule may be the tip for a pike, enabling the bearer to rest it on the ground (Fig 22.2). An incomplete iron rowel spur is decorated with white metal inlay in a crude pattern of short parallel oblique lines (Fig 22.3). Similar decorated spurs, often with silver inlays, are known from the early 17th century (*cf* Biddle 1990, fig 331, no. 3873; Bradley & Butler 2008, fig 74, 2; Drewett 1976, fig 15, no. 54). Also most likely associated with horse equipment is a copper-alloy rumble bell (sf 9); similar bells were retrieved from Basing House, Hants, an assemblage dominated by finds with a military association, following its demise after a final siege during the Civil War in 1645 (Moorhouse 1971, fig 25, nos 163–4).

The few dress accessories among the finds included a copper-alloy strapend with incised cross-hatch decoration (Fig 22.4) and two copper-alloy lace-chapes (sf 10). These finds were all associated with pottery from the late 16th and early 17th centuries. The simple tongue-shaped strapend has its closest parallels in late medieval finds (*cf* Ward Perkins 1940, fig 85, 7). It may be a residual find; Tudor and Stuart period strapends appear to be dominated by more elaborate forms with terminal loops and attachment hooks (Egan 2005, 41). Copper-alloy lace-chapes, however, are characteristic of the period, reflecting the fashion of laced-up clothing (Margeson 1993, 22). A date in the late 16th or early 17th century is likely for the incomplete copper-alloy jeton (sf 12; *cf* Mitchener 1988, 418, no. 1433). Used for calculating sums on the chequer board, the jeton is of the ubiquitous 'rose/orb' type produced in Nuremberg at this time (Mitchener 1988, 353).

In addition to the finds from Tower Green, earlier investigation in the traditional location of the execution site, just to the north of Area A, produced two items. One is a domed military button of copper alloy with iron backing (TOL101 sf 1). The button shows the Queen Victoria crown, and part of a Royal cipher. The other object is an octagonal-cut thick lead sheet with a rectangular hole at the centre (Fig 22.5). This is possibly some form of weight; more elaborate button- and buckle-like lead objects of a similar size were used as weights to hold down skirts and curtains in the 18th to early 20th centuries (Bailey 2004, 83). Both items were retrieved from a building demolition layer dated by pottery to the period 1820+.

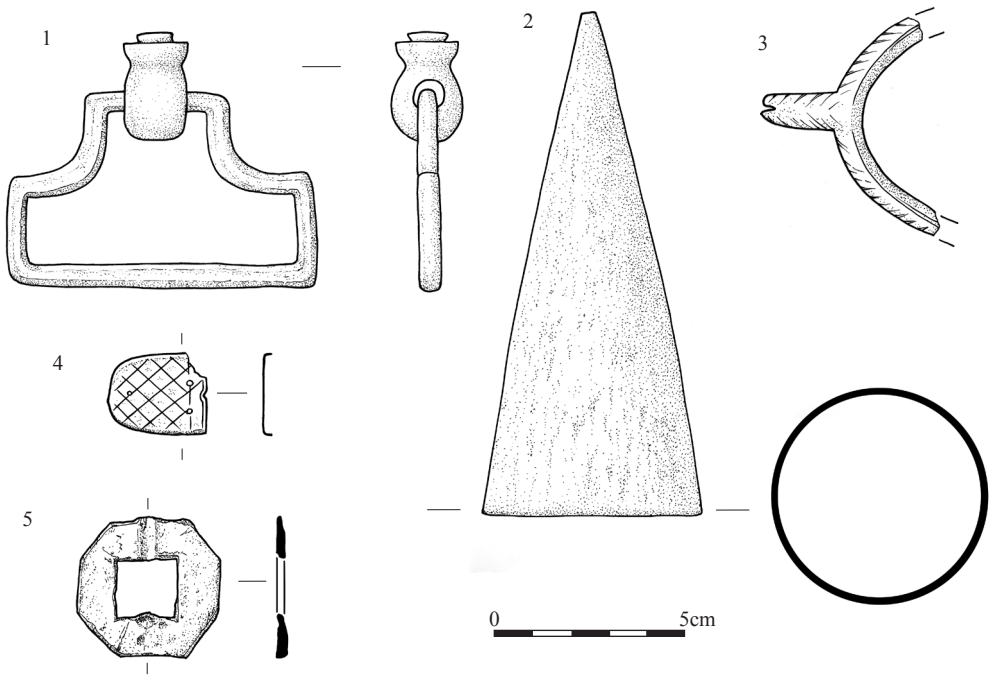

Fig 22. Small finds from Tower Green, for details see catalogue: 1. T-shaped drop handle <16>; 2. Iron ferrule <1>; 3. Iron rowel spur <19>; 4. Copper-alloy strapend <5>; 5. Perforated lead weight? TOL101<2>

Finds catalogue TOL103

Household furnishings

[3] <16>: complete copper-alloy T-shaped drop handle; W 80mm; from furniture (Fig 22.1). Phase 4, made ground east of wall [1], pot date: 1630–1680.
[4] <3>: copper-alloy curtain ring; complete; diam 27mm; Phase 4, made ground west of wall [1], pot date: mid-17th century.
[4] <17>: copper-alloy curtain ring; complete; diam 35mm; Phase 4, made ground west of wall [1], pot date: mid-17th century.
[26] <8>: copper-alloy curtain ring; complete; diam 27mm; Phase 4, dump/backfill, pot date: mid-17th century.
[78] <15>: copper-alloy curtain ring; complete; diam 28mm; Phase 3, metalworking residue, pot date: n/a.

Cutlery

[24] <7>: **flat tapering ivory scale tang handle** with iron rivets; L *c.*75mm; heavily corroded end but x-ray suggests rounded finial with metal end plate; part of iron knife blade extant; **Phase** 3, dump/backfill, pot date: mid-17th century.

Dress accessories

[10] <5>: complete oval-ended copper-alloy strapend; incised with simple crosshatch; folded edges; 3 rivet holes; L 26mm, W 26mm (Fig 22.4); **Phase 4, backfill of drain [11], pot** date: 1580–1650.
[27] <10>: two complete copper-alloy lace-chapes; Oakley Type 2 with edges folded inwards, L 28mm; Norwich Type 3 with edges overlapping along the length, L 35mm; **Phase** 3, made ground, pot date: 1570–1650.

Horse equipment

[10] <19>: **iron rowel spur with ?tin inlays in** the shape of short parallel striations/fishbone pattern; incomplete (Fig 22.3); **Phase 4, backfill** of drain [11], pot date: 1580–1650.
[27] <9>: cast copper-alloy rumble **bell; in-**complete and heavily corroded; diam *c.*30mm; Phase 3, made ground, pot date: 1570–1650.

Arms and armour

[4] <1>: **large iron ?ferrule; hollow with pointed** end; L 130mm, diam 58mm; ?tip/ferrule for wooden pike (Fig 22.2); **Phase 4, made ground** west of wall [1], pot date: mid-17th century.

[4] <18>: iron shot/cannon ball; complete; diam 60mm; Phase 4, made ground west of wall [1], pot date: mid-17th century.

Numismatica

[46] <12>: copper-alloy **jeton; Nuremberg rose/** orb; incomplete; late 16th–17th century; **Phase** 4, levelling layer, pot date: n/a.

Finds catalogue TOL101

[5] sf <1>: domed military button of copper alloy with iron backing; Queen Victoria crown and part of Royal cypher visible; diam 25mm. Complete but corroded.
[5] sf <2>: ?weight of octagonal-cut thick lead sheet with rectangular hole at centre; 35 x 35mm with 16 x 16mm hole (Fig.22.5)

THE ANIMAL BONES

Kevin Rielly

Introduction

A moderate quantity of animal bones was recovered from the three trenches excavated at Tower Green, with the great majority provided by Area A. The archaeology was essentially associated with the 17th-century Old Main Guard building and environs. All of the bones from this area, as well as those from the peripheral Areas B and C, are well preserved and only minimally fragmented. Notably, the bone collections were all recovered by hand.

Methodology

The bone was recorded to species/taxonomic category where possible and to size class in the case of unidentifiable bones such as ribs, fragments of longbone shaft and the majority of vertebra fragments. Recording follows the established techniques whereby details of the element, species, bone portion, state of fusion, wear of the dentition, anatomical measurements and taphonomy including natural and anthropogenic modifications to the bone were registered.

Description of faunal assemblage by phase

The assemblage was essentially divided between Phases 3 and 4, covering the major use period of the Old Main Guard building followed by subsequent rebuilding, alterations and eventual demise. There appears to be a rather slight difference in the dating of these two phases, centred on the mid- and later parts of the 17th century respectively, although some deposits in Phase 4 do extend to the early 19th century. Table 2 shows the species representation of the phased assemblage, which, as mentioned above, very largely derives from Area A.

Phase 3 Area A: mid-17th century

The great majority of the bones from this phase were recovered from cellar backfills (131 out of 134). These backfills contained a wide range of food species, mainly composed of animal and bird domesticates but also with a few game species, such as fallow deer, rabbit and partridge. The dove and mallard bones could represent either wild or domestic birds. There was a single fishbone, a cod cleithrum, from a rather large fish (possibly up to 1m in length). Rabbit bones are relatively abundant amongst these backfills, largely provided by a single deposit [12], with 23 bones representing the partially articulated fore- and hind-paws of at least three individuals. These can be interpreted as processing waste.

Table 2. Counts of animal bone in each occupation phase (hand collected bones only)

Species/Animal size class	**3**	**4**
Cattle (*Bos taurus*)	14	28
Cattle-size	19	13
Sheep/Goat (*Ovis aries/ Capra hircus*)	35	26
Goat (*Capra hircus*)		2
Fallow deer (*Dama dama*)	2	1
Pig (*Sus scrofa*)	6	2
Sheep-size	20	12
Dog (*Canis familiaris*)		1
Rabbit (*Oryctolagus cuniculus*)	25	
Chicken (*Gallus gallus*)	5	5
Dove (*Columba livia*)	2	
Goose (*Anser anser*)		1
Mallard (*Anas platyrrhynchos*)	2	
Partridge (*Perdix perdix*)	3	
Cod (*Gadus morhua*)	1	
Grand Total	**134**	**91**

Cattle and sheep/goat provided the greater proportion of the assemblage, here including the cattle- and sheep-sized collections, which were largely composed of rib and vertebral fragments. The sheep/goat assemblage features a notable absence of processing waste (head or foot bones) and a clear bias towards upper limb parts (scapula, pelvis, humerus and femur), these comprising 26 out of 35 bones. These collections could represent waste from imported meat joints, clearly favouring the better quality cuts, implying that processing took place elsewhere in the Tower or perhaps that a proportion of the meat demand was met by city butchers. Most of the sheep/goat bones are from adult individuals (see Table 3), at least two years of age, with the majority three years or older. In contrast, the cattle bones feature a large proportion of young animals (possibly veal calves), the remainder probably taken mainly from adult individuals (two years or older). Unlike the sheep/goat collections, there is a greater mix of skeletal parts. However, their distribution appears to be age related, with all the processing waste (limited to four metatarsals) arising from young calves. The assumption previously made regarding the import of particular cuts of mutton may therefore equally apply to the older cattle, while veal calves, for whatever reason, may have been processed in the vicinity of the Old Main Guard building.

The size of the major domesticates is rather typical of the period, where the majority of farm animals are not dissimilar in size to their medieval forebears. Of some interest, however, was the recovery of a humerus from a relatively large pig. Though not totally fused, it was possible to extrapolate a total length of approximately 226mm, which would have represented an animal about 91.8cm at the shoulder (Boessneck & von den Driesch 1974). This is more likely to represent a large male than a wild boar, as this species appears to have been extinct in England by the 13th century. Attempts were made to reintroduce wild boar in the early 17th century, first by James I into Windsor and then by Charles I into the New Forest, but both failed (Yalden 1999, 168). However, it is just possible that this large pig came from the remnants of one of these herds.

Phase 4 Area A: late 17th century

The majority of the bones (51 out of 77) were recovered from the external dumping. Most of the remaining bones were derived from the fill of the brick-lined drain [11] (14 bones) dating to the mid-17th century.

There is a noticeably constricted list of species in comparison to Phase 3 and also a substantially greater representation of cattle relative to sheep/goat. In addition there appears to be a lesser proportion of veal bones. Although most of the cattle are clearly from adult individuals, the ageing evidence would suggest that a large proportion of these were culled as young adults (in their third or fourth year). There is a continued bias towards upper limb parts (16 out of 28) and only a minor representation of head and foot bones. This does not, however, apply to the Phase 4 sheep assemblage, which is thoroughly mixed anatomically.

Table 3. Distribution of cattle and sheep/ goat age groups

Using the following groups: Very young – the number of bones identified by the porosity, state of epiphyses fusion and/ or the stage reached in the tooth eruption sequence; Early – fusion of the P scapula, D humerus, P radius and pelvis acetabulum; Late – fusion of the P humerus, P ulna, D radius, P and D femur, P tibia and P calcaneus, where P is proximal and D is distal. F, JF and UF are the number of fused, just fused and unfused epiphyses respectively. Ages of fusion (from Schmid 1972, 75) are Early – 0.5 to 1.5 years in cattle and 0.25 to 0.5 years in sheep; Late – 3.5 to 4 years in cattle and 3 to 3.5 years in sheep.

Species	Phase	Very young	Early		Late		
			F	UF	F	JF	UF
Cattle	3	5	1	0	0	0	1
	4	2	2	0	3	1	5
Sheep	3	1	16	0	7	4	4
	4	1	10	0	2	1	2

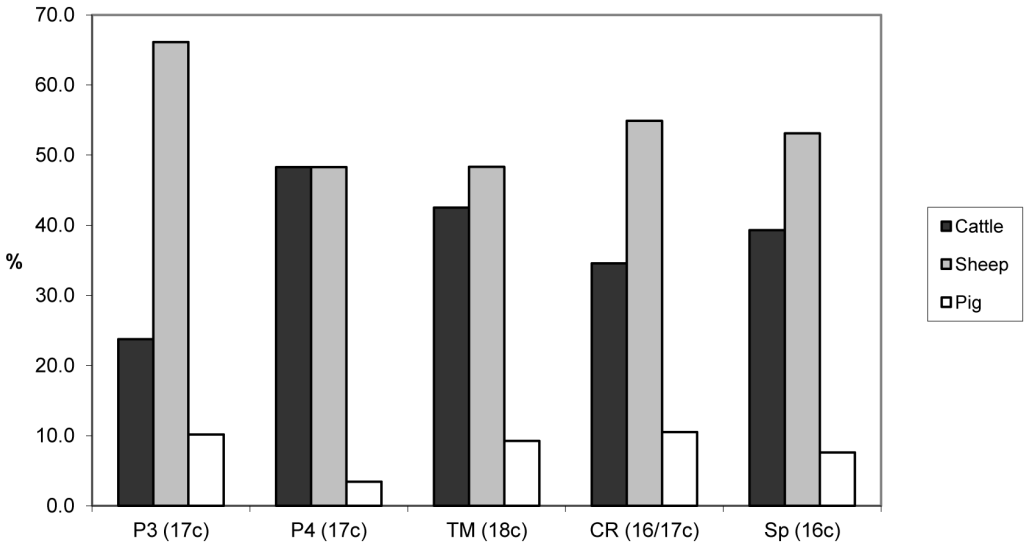

Fig 23. Percentage representation of fragments of cattle, sheep and pig from Tower Green (Phases 3 and 4), the Tower Moat (TM), Coopers Row (CR) and Spitalfields (Sp), with dates of assemblages to the nearest century (in brackets)

This phase also provided one non-food item, a humerus from a large dog, which probably stood about 65.2cm at the shoulder (using Harcourt 1974), calculated from a length of 148mm. Such a large animal may have been used for guard duties and/or as a hunting dog.

Conclusions

The Phase 3 and 4 bone assemblages correspond to a rather narrow margin of time covering the use and the subsequent demise/demolition of the Old Main Guard building, approximately dated to the middle and the later 17th century respectively. While these collections are not large (see Table 2), and cannot therefore be subject to detailed analysis, they do show a number of interesting features. The dominance of cattle and sheep and the rather poor representation of pig is certainly a common trait during this period, generally with similar proportions of the two main species or a greater abundance of sheep. This is clearly shown (see Fig 23) by the large collections from the Tower Moat excavations (Ingrem & Serjeantson 2004, 186), as well as from the more domestic rubbish deposits found at Coopers Row and Spitalfields (Rielly in prep a; in prep b).

Of particular interest is the rather small proportion of head and feet elements, *ie* butchers' waste, in the cattle and sheep collections, especially in Phase 3 (see Table 4). This suggests either the import into the Tower of dressed carcasses or the separate disposal of butchers' and kitchen waste. Notably, the cattle 'head and foot' waste in Phase 3 comprised four veal calf metapodials. Here it can be suggested that the import and/or deposition practices were age related, with veal calves treated in a different fashion to adult cattle. The bone assemblages from the Tower Moat, although dated to the 18th century, offer clear evidence for the division of waste, as both the cattle and sheep collections comprise large proportions of head parts, mainly mandibles (Ingrem & Serjeantson 2004, 187). From this it can be concluded that the castle was supplied with whole carcasses that were butchered on the premises. The greater mix of parts in the Phase 4 collections probably illustrates the accumulation of waste materials from a number of sources and, obviously, that not all 'head and feet' ended up in the moat.

The wide range of food species, especially in Phase 3, comprising the major domesticates, poultry and a significant proportion of game, may be indicative of high status. A similar

range of food items was found in the Moat deposits, including a good representation of bones from veal calves. Such young cattle became an important food commodity from the late medieval era in response to the increased usage of cattle for dairy purposes (Albarella 1997, 22). While the proportion of age data is rather slight, it is noticeable that the Phase 3 cattle tend to be older adults, perhaps representing surplus dairy animals. The relative absence of youngsters, and indeed a rather smaller range of food species in Phase 4, could demonstrate a lesser status. An additional aspect in this respect is the clear abundance of good quality meat cuts in Phase 3 as shown by the wealth of upper limb bones (see Table 4).

Table 4. Distribution of cattle and sheep skeletal parts (where N is the number of bones, H+F equal head and foot, UL equal shoulder and pelvic bones plus humerus and femur, LL equal radius, ulna, tibia and carpals/tarsals, and % L equals UL+LL/N x 100)

Species	Phase	N	H+F	UL	LL	% L
Cattle	3	14	4	5	5	71.4
	4	28	4	16	8	85.7
Sheep	3	35		26	9	100.0
	4	26	8	12	6	69.2

DISCUSSION

The current archaeological investigations at Tower Green, while limited in scope, did succeed in revealing important structural remains of late medieval and post-medieval date. What became apparent was that there were at least two main phases of construction, which included a complex sequence of structural alterations. It is of course difficult to date, interpret and phase partially excavated structural remains. However, bearing in mind these difficulties, it is clear that the earliest activity (Phase 1) was the construction of a stone-lined cellar, which was in use by the 16th century (Fig 5). The dimensions of this cellar were at least 4.0m east–west by 2.80m north–south, its depth was *c.*2.12m. Evidence was discovered that the cellar apparently possessed a brick barrel vaulted ceiling and a possible internal dividing wall. A probable blocked up doorway (Phase 2) observed in the eastern wall of the cellar may indicate the existence of an external access or the presence of other undiscovered cellars further to the east (Fig 5). To the south of the cellar were fragments of masonry, which may represent the contemporary superstructure of this building together with associated drains.

Soon after *c.*1650, this cellared building was demolished. The cellar was then backfilled and its truncated remains were covered by soil dumping. By 1667 according to cartographic evidence a new larger building had been constructed on the site (Phase 3). The walls of this new building, while respecting the earlier southern and eastern walls of the cellar, were not wholly keyed into the existing foundations; instead the new walls were seated on the soil dumping which sealed the earlier building (Fig 14). This shoddy construction may indicate a desire to build quickly and cheaply. It also suggests that no trace of the earlier building was visible above ground when rebuilding began. The eastern portion of the new brick building apparently consisted of a corridor with a glazed tile floor, below which was a brick-lined drain (Fig 12). To the west of this corridor was at least one room. This area revealed a complicated sequence of structural alterations. The presence of cobbled surfaces further to the north indicates that this area was an external courtyard.

From the documentary and cartographic sources (discussed below), it seems reasonable to assume that the uncovered foundations represent the remains of a building known by the late 17th century as the Old Main Guard, which stood here until its demolition in 1685. To the east of this building was a linear brick wall (Fig 12), which is interpreted as part of the wall enclosing an area of formal garden depicted on the Ogilby and Morgan map of 1676 (Fig 24, e). Part of this same wall was recorded in 1975 (Parnell 1979, 323).

After the demolition of the Old Main Guard, its truncated remains were buried by soil dumping and at the same time the sloping area further south was levelled by dumping (Phase 4). These deposits are assumed to have been the by-product of nearby development within the Inner Ward of the Tower, perhaps the construction of the New Main Guard (discussed above). Therefore the finds recovered from these deposits and the Phase 3 infill of the cellar

provide a snapshot of daily life in the Inner Ward area of the Tower of London during the 17th century (see specialist reports).

The ceramics recovered from these Phase 3 and 4 deposits were mainly local redwares and Surrey/Hampshire border ware vessels (Fig 20). There was also a relatively high proportion of good quality imported pottery, mainly stoneware vessels for serving drinks. The locally produced ceramics included a high proportion of jugs, plus numerous serving bowls and dishes, which implies that this assemblage was predominantly connected with the serving and consumption of food and drink, but not its cooking and preparation. In fact this is the sort of assemblage that might have come from a mess hall or dining room, rather than a kitchen as vessels such as cauldrons, pipkins and skillets were present in relatively small numbers. The volume of clay tobacco pipes shows that smoking was a popular pastime. The animal bones show that the bulk of the meat being consumed during this period was derived from cattle and sheep/goats, but the presence of game species, including fallow deer, rabbit and partridge, shows evidence of a varied diet. Of particular interest is the rather small proportion of head and feet carcass elements. This would suggest that dressed animal carcasses were being brought into the Tower or that butchery waste was disposed of separately, perhaps dumped in the moat. However, the presence of partially articulated fore and hind rabbit paws indicates that some of these animals were processed locally. One of the Phase 4 bones was a humerus from a large dog, which might have served as a guard or hunting dog. The metalwork present included cutlery, household fittings, dress accessories and horse equipment, while military equipment was represented by a cannon ball and a large iron ferrule, possibly the tip of a wooden pike (Fig 22.2).

Cartographic evidence for the buildings on site

The identification of the excavated remains as the Old Main Guard building rests primarily on their correlation with a series of buildings depicted on various 16th- and 17th-century maps (Fig 24). These maps all (with the exception of Ogilby and Morgan's cartographic representation) are pictorial 'bird's-eye-views'. The accuracy of these maps is also questionable, with perhaps the exceptions of the Haiward and Gascoyne Survey of 1597 and the Ogilby and Morgan map of 1676; nevertheless they do provide important chronological evidence for the sequence of buildings which existed on site.

The earliest known representation of a structure here is depicted on the Agas map of *c.*1562–63, which shows a prominent, T-shaped, possibly single storey, building (Fig 24, a). A similar shaped building is shown on the Braun and Hogenberg map of *c.*1570 (Fig 24, b). Interestingly, a phase of rebuilding is evident in the Haiward and Gascoyne 1597 survey, just 20 years later (Fig 24, c). This survey depicts a rectangular, possibly two storey, building. By the mid-17th century, some 70 years later, a much larger building seems to occupy the site. Hollar's view of the Tower of London in 1667 shows a substantial L-shaped structure, occupying almost one third of the area of Tower Green (Fig 24, d). The Ogilby and Morgan map of 1676 also shows a substantial L-shaped building, larger than the Chapel of St Peter ad Vincula to the north (Fig 24, e), but the footprint of the 'L' has been reversed from left to right from that shown on Hollar's earlier view. Whether this represents another phase of rebuilding, or simply inaccurate cartography is unclear.

The earliest phase of building (Phase 1), the cellar and the associated walls are interpreted as the remains of the building shown on the Agas and Braun and Hogenberg maps. The appearance of the building shown in this location on the Haiward and Gascoyne, Hollar, and Ogilby and Morgan maps varies considerably, but they all depict a structure that can be equated with the Phase 3 building. The accuracy of the Hollar map is questionable, whilst the Haiward and Gascoyne map, although more accurate, is still a 'bird's-eye' view. The more reliable Ogilby and Morgan map, which has been shown to be remarkably accurate elsewhere in the City of London, does not maintain its accuracy within the Tower of London, possibly due to restricted access to this military zone. Overlaying the results of the archaeological investigations onto the Ogilby and Morgan map (Fig 26) is difficult, as the various towers and curtain wall do not equate with

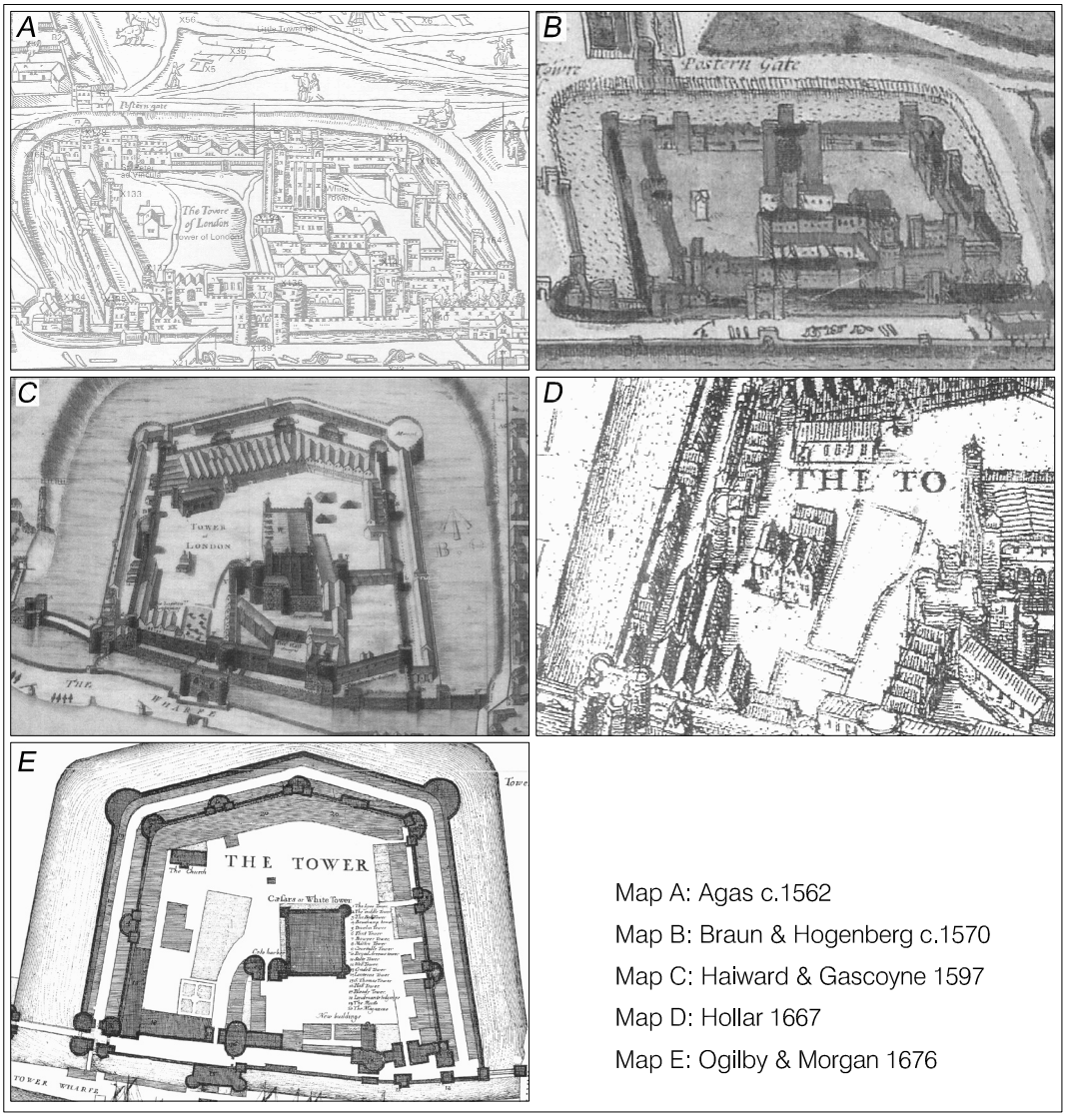

Fig 24. Historic maps: (a) Agas c.1562; (b) Braun and Hogenberg c.1570; (c) Haiward and Gascoyne 1597; (d) Hollar 1667; (e) Ogilby and Morgan 1676

modern Ordnance Survey maps, but a best fit based on the position of the garden wall has been attempted. This places the walls in the northern part of the L-shaped structure with the eastern wall of the corridor forming the external eastern wall of the building.

Reconstruction of the Old Main Guard

The features recorded during this investigation have confirmed Parnell's interpretation that this was the site of the Old Main Guard building (Parnell 1979, 320). However, there is a problem with the published location of several of the structural features (Parnell 1979). While undoubtedly the same structures were being recorded, their locations did not match. These discrepancies became clear when current fieldwork was correlated with publication of the 1975 observations. This placed the present area of investigation (Area A) much further to the south than

Fig 25. Revised plan of 1975 archaeological investigation

it actually was, and the published location of the vault would have placed it where no evidence of it was found. On re-examining the original 1975 excavation primary records, several inconsistencies between these records and the published plans came to light (Fig 25). In Parnell's original records six trenches were recorded, annotated A–F. Trenches A and B contained the boundary walls of the Upper and Lower Gardens, the western wall of the former being recorded by this current investigation. However, Trench C, which is depicted in the published plan with a brick floored area at its northern end, should have contained two east–west-aligned walls at its northern end and a brick drain at its southern end. The north–south wall with associated floor should have been placed in Trench D to the north where the long wall and glazed tiles were located. This long wall and floor should have been placed further north in Trench E where the vault was located. The original records also locate the vault approximately 8m north of its published location on a spur leading from the top of the trench which was not included on the original published plan. To add to the confusion the vault is also depicted on the published plan at twice its actual size.

Consequently, creating an accurate plan which brings together the 1975 and 2007 results has proved difficult. There is no doubt about the accuracy of the 2007 plans as these were correlated to the Ordnance Survey grid. Therefore, by using the 2007 plans it has been possible to create a 'best fit' by comparing the location of the 1975 service trench, as re-exposed in 2007, and those features that were uncovered in both investigations, most notably the eastern wall of the brick building, wall [40]. With the aid of the updated and corrected plans it is now possible to rectify the previous inconsistencies and to 'best fit' these discoveries with the footprint of the building depicted on the Ogilby and Morgan map (Fig 26).

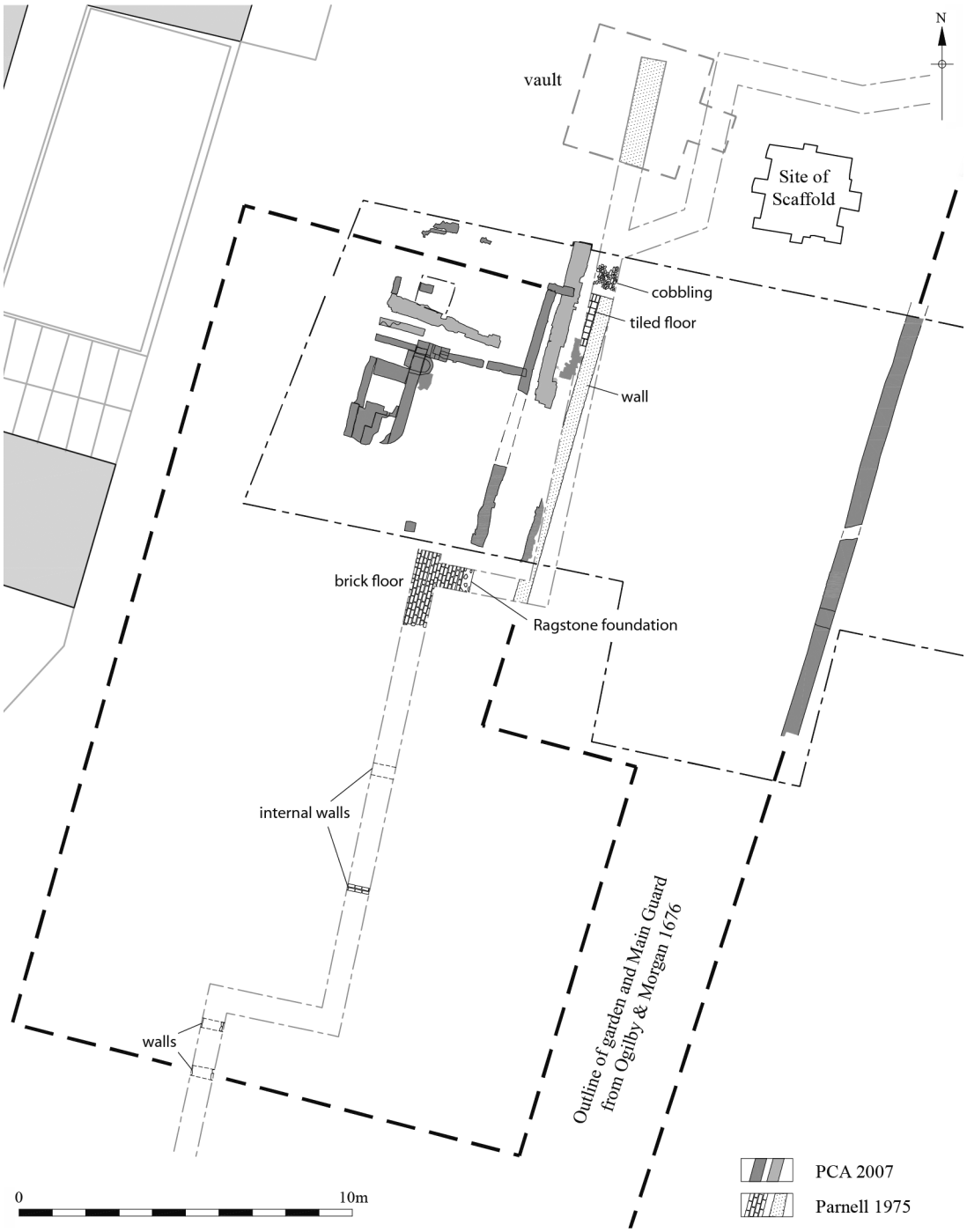

Fig 26. Reconstruction of Old Main Guard based on Ogilby and Morgan map, 1975 investigation and present findings

Bringing together these two phases of fieldwork, it can be seen that the partly exposed rectangular stone cellar was the earliest building recorded (Phase 1); it underwent several alterations (Phase 2). Shortly after 1650 this cellar was demolished and infilled. By 1667 a larger brick building had been constructed on the site (Fig 24, d). Using data from the Ogilby and Morgan map, this new building (Phase 3) is reconstructed as L-shaped (Fig 24, e; Fig 26). A north–south-aligned tiled corridor was situated along the eastern side of the northern arm of this building. To the west of this corridor was evidence of at least one room. To the north of this room were patches of cobbled surfaces (found in both 1975 and 2007), suggesting that this area was a courtyard. Where the corridor entered this yard there was apparently a porch over the doorway. Along the northern side of this courtyard was a vaulted brick structure which may have served as a water collection tank or soakaway and was probably fed by the various drains recorded nearby. The southern arm of this building is only known from the 1975 investigation. Trench D revealed evidence of the ragstone foundation for the western wall of this corridor (Fig 26). To the west of the corridor was evidence of a room with a brick-paved floor. Further south there was fragmentary evidence of two east–west-aligned internal walls, which may define the southern extent of this corridor. Two other previously unpublished parallel east–west-aligned walls (Trench C) may have formed part of the southern wall of this building. Their layout suggests the presence of an internal corridor similar to that seen along the eastern side of the building. Estimating the distance between the possible northern wall as found in Area A and the possible southern wall would indicate a building approximately 25m long north–south, which correlates with the size of the Old Main Guard as shown on the Ogilby and Morgan map of 1676. The projected location of the Old Main Guard would suggest that part of it should lie in the northern part of Area C. However, no foundations or floor were recorded in this area and it is possible that either the Ogilby and Morgan plan is inaccurate or that any foundations of the Old Main Guard here were removed by truncation.

Both the 1975 and current investigations demonstrate that significant archaeological deposits exist very close to the surface at Tower Green. Prior to Parnell's investigations in 1975, 'The possibility of any archaeological deposits being disturbed … was considered unlikely; at such shallow depth it was thought that only modern make up levels would be encountered' (Parnell 1979, 320). During Oxford Archaeology's long-term investigations at the Tower in the 1990s significant archaeological features were repeatedly found to survive close to the modern surface, despite assumptions to the contrary (Hiller & Keevill 1994, 180).

Function of the Old Main Guard

What was the function of the Old Main Guard building, and why did it require various alterations and replacements during its lifespan? That the Old Main Guard served as a guardhouse is obvious, but any more detailed explanation of its function can only be guessed at. A clue may be provided by the 19th-century version of the Main Guard in the Tower of London. This 19th-century building, in addition to being a guardroom, served as an orderly room, offices and stores, a recreation area, a mess and lecture rooms (Parnell 1993, 108). It may be suggested that the Old Main Guard served a similar range of functions for the Yeoman Warders and soldiers based here. Perhaps the various phases of rebuilding were carried out in response to the changing needs of what was a practical building; and the constant alterations indicate that it was presumably never quite adequate for its function. Indeed the New Main Guard building which was built to replace the old building in 1685 only survived for three years before demolition was started to make way for the construction of the Grand Storehouse (Parnell 1979, 326).

ACKNOWLEDGEMENTS

Pre-Construct Archaeology Ltd would like to thank Historic Royal Palaces, in particular Ms Jane Spooner, Curator of the Tower of London, for commissioning the work. The help and advice of Graham Keevill, archaeological consultant for the Tower of London, is gratefully acknowledged. We would also like to thank the

contractors of Paye Stonework & Restoration Ltd for their help and patience.

The author would like to thank the excavation team of Stuart Holden (who supervised the initial part of the watching-brief), Berni Sudds, Will Johnson, Ian Banks, Gosia Trelka, Rik Archer, Lisa Lonsdale (logistical support) and Jem Rogers (surveying). Gratitude is also expressed to Mark Roughley who produced the AutoCAD drawings, Cate Davies for the finds illustrations, and Strephon Duckering for photography. Jon Butler and Chris Mayo undertook the project management, while Jon Butler also managed the post-excavation and editing of this article.

Thanks are also due for the contributions of the following specialists; Chris Jarrett (clay tobacco pipe), Berni Sudds (post-Roman pottery), Kevin Hayward and Berni Sudds (building materials), Kevin Rielly (animal bone), and Märit Gaimster (small finds).

swatson@pre-construct.com

BIBLIOGRAPHY

ALBARELLA (1997), U Albarella 'Size, power, wool and veal: zooarchaeological evidence for late medieval innovations' in G De Boe & F Verhaeghe (eds) *Environment and Subsistence in Medieval Europe, Papers of the 'Medieval Europe Brugge 1997' Conference* Volume 9, 19–30

ALLEN BROWN & CURNOW (1984), R Allen Brown & P E Curnow *Tower of London*

ARCHER (1997), M Archer *Delftware, the Tin-glazed Earthenware of the British Isles, A Catalogue of the Collection of the Victoria and Albert Museum*

ATKINSON & OSWALD (1969), D Atkinson & A Oswald 'London clay tobacco pipes' *Journal British Archaeology Association* 32, 171–227

BAILEY (2004), G Bailey *Buttons and Fasteners 500BC–AD1840*

BIDDLE (1990), M Biddle *Object and Economy in Medieval Winchester* Winchester Studies 7ii, Artefacts from Medieval Winchester

BLACKMORE (1996), L Blackmore 'The medieval and later pottery' in Hutchinson (1996), 123–30

BLACKMORE (2006), L Blackmore 'The medieval and post-medieval pottery' in J Butler *Reclaiming the Marsh: Archaeological Excavations at Moor House, City of London* Pre-Construct Archaeology Monograph 6

BOESSNECK & VON DEN DRIESCH (1974), J Boessneck & A von den Driesch 'Kritische anmerkungen zur widderristhöhenberechnung aus Längenmassen vor und frühgeschichtlicher tier-knochen' *Saugetierkdl Mitt* 22 (4), 325–48

BRADLEY & BUTLER (2008), T Bradley & J Butler *From Temples to Thames Street. 2000 Years of Riverside Development. Archaeological Excavations at the Salvation Army International Headquarters, 99–101 Queen Victoria Street, City of London* Pre-Construct Archaeology Monograph 7

BROWN & THOMSON (2004), D H Brown & R Thomson 'Appendix 1: the pottery' in Keevill (2004), 221–40

BRUNSKILL (1990), R W Brunskill *Brick Building in Britain*

CHARLTON (1978), J Charlton (ed) *The Tower of London: its History and Institutions*

CUNNINGHAM & DRURY (1985), C M Cunningham & P J Drury *Post-medieval Sites and their Pottery: Moulsham Street, Chelmsford* Chelmsford Archaeological Trust Report 5/CBA Res Rep 54

DREWETT (1976), P Drewett 'The excavation of the Great Hall at Bolingbroke Castle, Lincolnshire, 1973' *Post-Medieval Archaeology* 10, 1–33

EGAN (2005), G Egan *Material Culture in London in an Age of Transition. Tudor and Stuart Period Finds c 1450–c 1700 from Excavations at Riverside Sites in Southwark* Museum of London Archaeology Service Monograph 19

GAIMSTER (2008), M Gaimster 'The metal and small finds' in Watson (2008)

HARCOURT (1974), R A Harcourt 'The dog in prehistoric and early historic Britain' *Journ Archaeol Science* 1, 151–76

HIGGINS (2004), D Higgins 'The clay tobacco pipes' in Keevill (2004), 241–70

HILLER & KEEVILL (1994), J Hiller & G D Keevill 'Recent archaeological work at the Tower of London' *Trans London Middlesex Archaeol Soc* 45, 147–81

HURST *et al* (1986), J G Hurst, D S Neal & J H van Beuningen, *Pottery Produced and Traded in North-West Europe 1350–1650* Rotterdam Papers 6

HUTCHINSON (1996), M Hutchinson 'Edward VI's Bulwark: excavations at Tower Hill, London, 1985' *Trans London Middlesex Archaeol Soc* 47, 103–44

INGREM & SERJEANTSON (2004), C Ingrem & D Serjeantson 'Animal bone' in Keevill (2004), 186–9

JARRETT (2005), C Jarrett 'The pottery' in D Killock & F Meddens 'Pottery as plunder: a 17th-century maritime site in Limehouse, London' *Post-Medieval Archaeology* 39/1, 34–52

JARRETT (forthcoming), C Jarrett 'The distribution of 17th-century clay pipes in London' Society of Clay Pipe Research

KEEVILL (2004), G Keevill *The Tower of London Moat: Archaeological Excavations 1995–9* Historic Royal Palaces Monograph 1

KEEVILL (2006a), G D Keevill *The Tower of London: Analysis of Historic Surface Finishes: Case Study Tower Green and the Scaffold Site* Keevill Heritage Consultancy. Report commissioned by Historic Royal Palaces

KEEVILL (2006b), G D Keevill *The Tower of London. Analysis of Historic Surface Finishes* Keevill Heritage Consultancy. Report commissioned by Historic Royal Palaces

MARGESON (1993), S Margeson *The Medieval and Post-Medieval Finds from Norwich Survey Excavations* East Anglian Archaeology 58

MPRG (1998), Medieval Pottery Research Group *A Guide to the Classification of Medieval Ceramic Forms* Medieval Pottery Research Group Occasional Paper 1

MILANESE (1993), M Milanese 'Italian pottery exported during the 15th and 16th centuries' *Medieval Ceramics* 17, 25–33

MITCHINER (1988), M Mitchiner *Jetons, Medalets and Tokens: the Medieval Period and Nuremberg Vol I*

MOORHOUSE (1971), S Moorhouse 'Finds from Basing House, Hampshire (*c.* 1540–1645): Part Two' *Post-Medieval Archaeology* 5, 35–76

NELSON (1996), S Nelson 'The clay pipes' Hutchinson (1996), 133

NELSON & HIGGINS (1996), S Nelson & D Higgins 'The initialled pipe bowls' in Hutchinson (1996), 133–4

OSWALD (1975), A Oswald *Clay Pipes for the Archaeologist* BAR Brit Ser 14

OAU (1995), Oxford Archaeological Unit *Tower of London: New Electricity Inner Ring Main – Report of the Archaeological Recording Action* unpub report

PARNELL (1979), G Parnell 'Observations on Tower Green' *London Archaeologist* 3, No. 12, 320–6

PARNELL (1980), G Parnell 'The reconstruction of the Inmost Ward during the reign of Charles II' *Trans London Middlesex Archaeol Soc* 31, 147–56

PARNELL (1982), G Parnell 'The excavation of the Roman city wall at the Tower of London and Tower Hill, 1954–1976' *Trans London Middlesex Archaeol Soc* 33, 85–133

PARNELL (1983a), G Parnell 'Excavations at the Salt Tower, Tower of London, 1976' *Trans London Middlesex Archaeol Soc* 34, 95–106

PARNELL (1983b), G Parnell 'The western defences of the Inmost Ward, Tower of London' *Trans London Middlesex Archaeol Soc* 34, 107–50

PARNELL (1983c), G Parnell 'The refortification of the Tower of London 1679–86' *Archaeol Journ* 63 part 2, 337–52

PARNELL (1985), G Parnell 'The Roman and medieval defences and later development of the Inmost Ward, Tower of London: excavations 1955–77' *Trans London Middlesex Archaeol Soc* 36, 1–79

PARNELL (1993), G Parnell *The Tower of London*

PEARCE (1992), J Pearce *Post-Medieval Pottery in London, 1500-1700. Volume 1: Border Wares*

PEARCE (2007), J Pearce 'An assemblage of 17th-century pottery from Bombay Wharf, Rotherhithe, London SE16' *Post-Medieval Archaeology* 41/1, 80–99

RIELLY (in prep a), K Rielly 'The animal bones' in G Hunt *Excavations at Coopers Row, London EC3* LP Archaeology Monograph

RIELLY (in prep b), K Rielly 'The animal bones' in N Jeffries & C Thomas *Excavations at Post-Dissolution Spitalfields – the History and Archaeology of a London Suburb from 1539–1860* Museum of London Archaeology Monograph

SCHMID (1972), E Schmid *Atlas of Animal Bones*

SUTHERLAND (2003), D S Sutherland *Northamptonshire Stone*

WARD PERKINS (1940), J B Ward Perkins *London Museum Medieval Catalogue*

WATSON (1992), B Watson 'The excavation of a Norman fortress on Ludgate Hill' *London Archaeologist* 6, No. 14, 371–7

WATSON (2006), S Watson *The Execution Site, Tower Green, Tower of London, London EC3, LB of Tower Hamlets. Archaeological Excavation* unpub report for PCA

WATSON (2008), S Watson *An Assessment of an Archaeological Watching Brief on Tower Green, Tower of London, London, EC3, London Borough of Tower Hamlets* unpub report for PCA

WHIPP (1980), D Whipp 'Excavations at Tower Hill, 1978' *Trans London Middlesex Archaeol Soc* 31, 47–67

WHIPP (2006), D Whipp *The Medieval Postern Gate by the Tower of London* MoLAS Monograph 29

YALDEN (1999), D Yalden *The History of British Mammals*

CARTOGRAPHIC SOURCES

British Geological Survey. 1;50,000 Series, England and Wales Sheet 256. North London Solid and Drift Geology. Map

Agas map *c.*1562–63

Braun & Hogenberg map 1572

Haiward & Gascoyne survey 1597

Hollar's survey 1667

Ogilby & Morgan map 1676

Rocque's map of 1747

Ordnance Survey map of 1873

Ordnance Survey map of 1894–6