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Shene Charterhouse, Richmond upon Thames: archaeological investigations, 2009–15

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Excavations on the site of the Carthusian priory of Shene Charterhouse revealed wall foundations and robber trenches delineating part of the north walk of the Great Cloister, an adjacent monastic cell, two latrine pits and the northern boundary of the priory. The results have enabled antiquarian observations and data from earlier geophysical surveys to be considered afresh and previous reconstructions of the ground plan of the cloister and adjacent cells to be revised.

Introduction

This report summarises the results of archaeological investigations before and during redevelopment and landscaping at the King's Observatory (also known by the misnomer 'Kew Observatory'), Old Deer Park, Richmond upon Thames (London TW9). The work was commissioned by Kew Holdings Ltd and chiefly undertaken by MOLA (Museum of London Archaeology). Those parts of the report concerned with the history of the site draw heavily on John Cloake's local histories and his unpublished report on the King's Observatory (Cloake 2009).

The site comprises a rectangular plot, roughly 200 x 130m, surrounded by the Royal Mid-Surrey Golf Club course (fig 1; TQ 17145 75760). It is on Metropolitan Open Land belonging to the Crown Estate (the Royal Mid-Surrey Golf Club has leased this part of the Old Deer Park from the Crown Estate since 1894: Cloake 1996, 176) and lies within a World Heritage Site buffer zone (that of the Royal Botanic Gardens, Kew), an 'Area of Archaeological Potential – priority 1' and a local authority conservation area. It is also in a Grade I park on Historic England's register of Parks and Gardens of special historic interest in England. Near the northern end of the site the King's Observatory, designed by Sir William Chambers, is a Grade I Listed building.

The site is of particular archaeological interest because its southern half lies on the site of Shene Charterhouse (1414–1539), the last and largest of the nine successful Carthusian priories to be founded in medieval England (Knowles & Hadcock 1971, 133–6). The monastic buildings were located in the western half of a rectangular walled precinct. In recognition of its national importance, the area of the monastic precinct, including the south-west quarter of the King's Observatory site, was awarded Scheduled Monument status by English Heritage (now Historic England) in March 2015 (NHLE 2015). The priory formed part of a 'late medieval monastic landscape' (Aston 1993, 142) covering a riverside area of less than 3km^2, which also included Syon Abbey, an abortive Celestine monastery and a friary of Observant Franciscans (*c* 1500–34) clustered around Shene Palace (renamed Richmond in 1501) (fig 1). Indeed, the group value of this medieval landscape, which also included the royal palace at Richmond, was one of the principal reasons for the scheduling of the Charterhouse site. Other reasons for scheduling included the degree of survival of archaeological remains and the potential for further archaeological investigation.

The layout of Shene Charterhouse reflected the Carthusian emphasis on an eremitical regime unlike the communal lifestyle of most other monastic orders. Its principal feature was a large cloister surrounded by cells (monks' houses), each with its own private garden and latrine (note that in archaeological literature, the term 'cell' is often applied to the house,

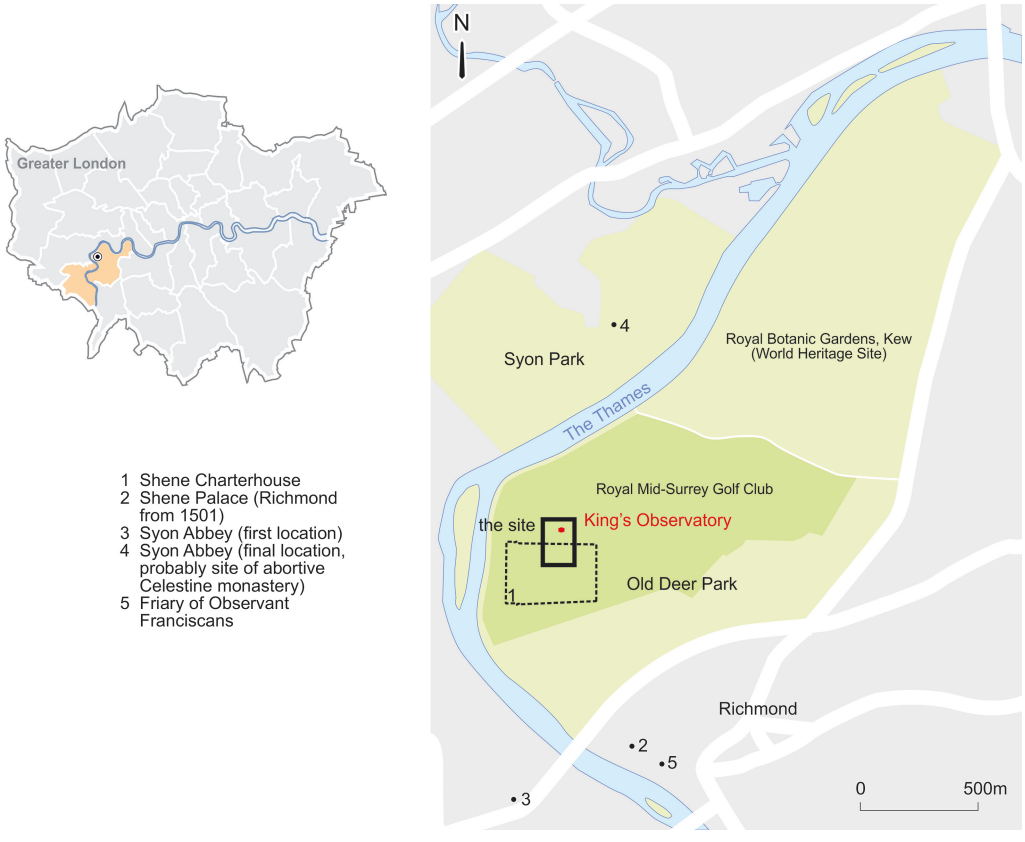

Fig 1 Shene Charterhouse. Site location. Scale 1:35,000.

garden and latrine as a single unit; see Barber & Thomas 2002, 19). The cell was the focus of daily life in Carthusian monasteries, where individual monks lived and prayed alone, only meeting in church for Matins, Vespers and, on Sundays and feast days, for Mass. Likewise, the refectory and chapter house were only used on Sundays and major festivals.

Circumstances of the archaeological investigations

The investigations began in 2009 with a report on the history of the site – later incorporated in an archaeological desk-based assessment (Cloake 2009; Cloake & Cowie 2010). Fieldwork commenced in January 2011 with a geophysical survey (undertaken by Stratascan on behalf of MOLA; Marsh & Biggs 2011), followed successively by evaluations in July and December 2011 (Cowie 2011a; 2012), a 'strip, map and sample' investigation in April and May 2013, excavations in May and June 2013, and a watching brief in April and May 2015. Features relating to the priory were exposed in trenches 3, 4, 8–14 and 20 (fig 2). All monastic wall foundations were left *in situ*. After recording they were covered with sheets of geotextile and, in most instances, sand, before reburial.

The largest trenches were excavated by machine under supervision by MOLA (figs 2 and 3). Five small trenches (10–14) were dug by hand over several weekends in May and June 2013 by the author with the help of the Richmond Archaeological Society and volunteers, who also extended trench 9 to the west to expose a monastic latrine. Most hand-dug trenches were positioned to establish the extent and ground plan of a monk's house (cell 1), and its garden and latrine.

Fig 2 Shene Charterhouse. Location of areas investigated. Scale 1:1500.

Conventions

The basic unit of reference in this report and the site archive is the context number, a unique number representing a single action, shown here in square brackets, thus: [10]. Likewise, accessioned finds are shown in angled brackets, thus: <33>. Standard reference codes originally developed by the Museum of London are used for pottery and ceramic building material fabric types. Details of standard Museum of London reference codes can be found at http://www.museumoflondonarchaeology.org.uk/resources. Clay tobacco pipes are classified and dated according to published typologies (Atkinson & Oswald 1969; Oswald 1975, 37–41 – respectively identified in the text by the prefixes AO and OS).

In the medieval period individual Carthusian cells were identified by letters of the alphabet, a convention followed by modern authors in reports on the London Charterhouse, to the north-west of the City (Knowles & Grimes 1954, 24–6 n 10; Barber & Thomas 2002, 20). If letters were assigned to the cells found at the King's Observatory they are not known,

Fig 3 Shene Charterhouse. The site during investigations in 2013, looking north. Photograph by Robert Cowie.

so for the purposes of this report they are numbered. The two cells recorded during the recent investigations are numbered 1 and 2, while others included in a partial reconstruction of the Great Cloister are numbered clockwise 3–11. Latrines are given the same numbers as their corresponding cells.

Sources and research archive

The starting point for research relating to the monastery and its layout should be John Cloake's comprehensive survey of 1990 (Cloake 1990, based on Cloake 1977), which he later shortened and revised (Cloake 1995, 35–48, 275). Other notable sources include the *Victoria County History* for Surrey (*VCH* 1905, 89–94), which provides a history of the priory, and the *History of the King's Works* (Allen Brown *et al* 1963, 265–8). All make frequent reference to primary sources, the most useful of which for reconstructing the layout of the priory is a Parliamentary Survey of January 1650 (TNA: E 317/Surrey 53; reproduced in Cloake 1990, 60–4, appendix 3) that describes West Sheen (the hamlet then standing on the site) including the few remaining priory buildings. The survey did not include a plan, although most (perhaps all) of the recorded buildings are shown on Moses Glover's map of Isleworth Hundred of 1635 (fig 4; Syon: B.XIII.1b Moses Glover's Map of Isleworth Hundred). Remains of the priory are also depicted in two drawings of Richmond Palace from the river Thames made by Anthonis van den Wyngaerde in 1561–2 (one a preparatory sketch), which show in the background both Shene and 'Sion' (Syon House), the latter newly built on the site of the Bridgettine abbey (fig 5). Two other pictures are apparently of the priory gateway; one a watercolour attributed to Samuel Hieronymous Grimm and dated to *c* 1770 (fig 6), the other an ink and wash drawing of the same subject.

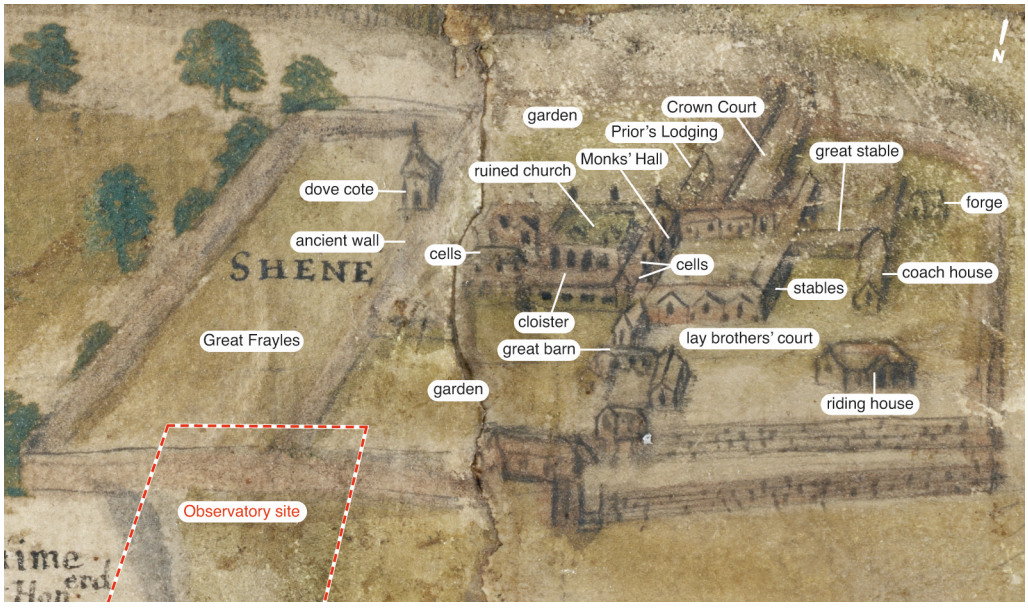

Fig 4 Shene Charterhouse. Detail from Moses Glover's map of Isleworth Hundred, 1635, showing the site including some extant former monastic buildings, labelled as identified by John Cloake (Cloake 1990, 45, fig 23). Map reproduced by permission of His Grace the Duke of Northumberland.

All records, unpublished evaluation reports, interim statements and artefacts relating to the recent archaeological investigations on the site will be deposited at the Museum of London Archaeological Archive under the site code KOB11. Some initial interpretations presented in the unpublished documents changed as the project progressed, but the results of the investigations presented here should be regarded as the definitive statement.

Historical and archaeological background, by John Cloake and Robert Cowie

A BRIEF HISTORY

The origins of the order can be traced back to 1084, when St Bruno of Cologne established a hermitage in the remote limestone massif of the Chartreuse near Grenoble. The first English Carthusian priory was founded in 1178–9 at Witham in Somerset, and others followed between 1222 and 1398 (Knowles & Hadcock 1971, 133). Shene Charterhouse, dedicated to Jesus of Bethlehem, was founded in September 1414 by Henry V, who granted it land from his demesne of the royal Manor of Shene, just over 0.5km north of the royal palace he was rebuilding at Shene. The first foundation charter tells us that the priory was established on an area of land measuring 3125 ft (*c* 953m) east–west x 1725 ft (*c* 526m) north–south (*VCH* 1905, 89). The following April a revised charter extended the holding to the north, and further royal grants of 64 acres (26ha) and 48 acres (19ha) of demesne land to the east and north-east of the priory were made to the monastery in 1442 and 1479 respectively. The slightly trapezoidal walled area of the priory was almost 400m east–west and up to 270m north–south. Henry originally envisaged an establishment large enough for 40 monks, although when William of Worcester visited Shene in the reign of Edward IV (1461–83) he apparently saw only about 30 cells around the Great Cloister, which he described as being 200 paces square – possibly translating to 350 ft (107m) square. According to Worcester the nave of the church was 60 paces long, perhaps 105 ft (32m) (Allen Brown *et al* 1963, 266).

Fig 5 Shene Charterhouse. Drawing of Richmond Palace from across the Thames by Anthonis van den Wyngaerde – detail showing Sheen Charterhouse. Reproduced with permission of the Ashmolean Museum, Oxford.

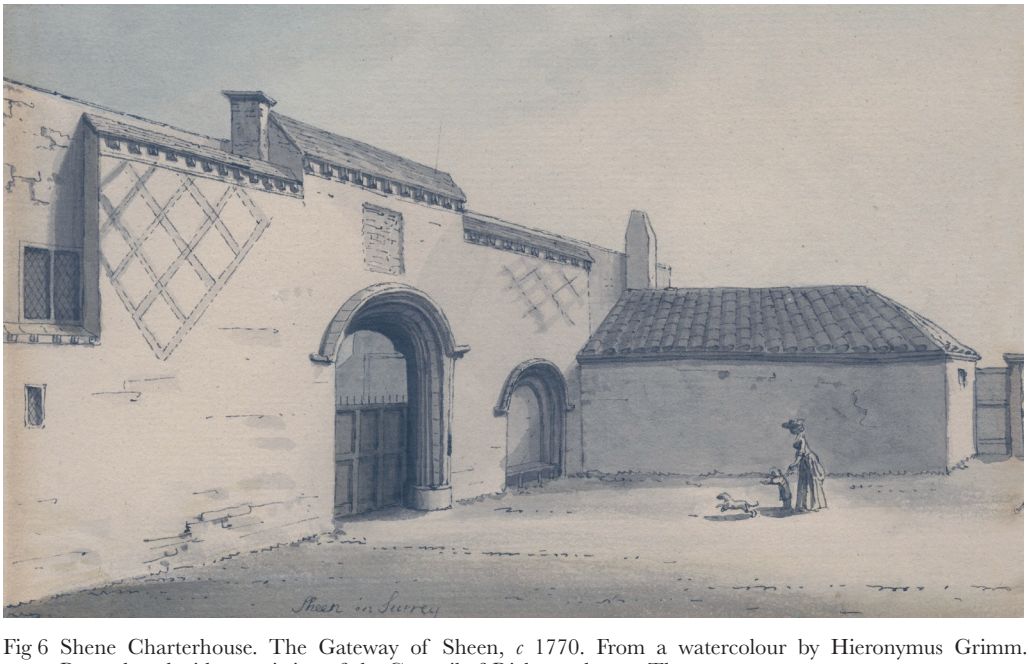

Fig 6 Shene Charterhouse. The Gateway of Sheen, *c* 1770. From a watercolour by Hieronymus Grimm. Reproduced with permission of the Council of Richmond upon Thames.

In 1415 Henry founded the Abbey of Saint Saviour and Saint Bridget of Syon on the riverbank opposite his embryonic palace. The Bridgettine abbey may have been originally situated roughly where The Avenue (A316) now approaches Twickenham Bridge (Urwin 1965, 106). The community later moved to the site where Syon House now stands, possibly the site of the aborted Celestine house (Allen Brown *et al* 1963, 265). The construction of a monastery of French Celestines was also begun but abandoned following the outbreak of war with France. The following year Henry founded a reclusory at Shene Charterhouse for a recluse chaplain (*VCH* 1905, 91).

Shortly before his death in 1519 Dr John Colet, Dean of St Paul's, was permitted to build a house within the precinct, which briefly provided lodgings for the disgraced Cardinal Wolsey in 1530, and was subsequently used by Reginald Pole (later Cardinal) (*VCH* 1905, 92; Cloake 1990, 12). Stow (1603, 298) records that after the battle of Flodden Field (1513) the body of James IV of Scotland was enclosed in lead and kept at the monastery.

In 1535 Shene had an annual net income of £800 5s 4½d, considerably more than any other Carthusian house in England including London Charterhouse with an income of £642 (*VCH* 1905, 93; Knowles & Hadcock 1971, 133). Shene Charterhouse and Syon Abbey were dissolved in 1539 and converted for use as secular mansions. Both were briefly restored under Queen Mary. In January 1557 the Carthusians returned to Shene, where the church choir and the chapter house were rebuilt, the rest of the church repaired, and a number of cells and a cloister constructed. The monastery returned to the Crown in 1559 shortly after the accession of Elizabeth, who swiftly reversed her half-sister's religious policy.

After the Dissolution the site of the priory became a nobleman's mansion called Sheen Place, and then, with the addition of a few more large houses, it formed the hamlet of 'West Sheen'. The 1650 Survey indicates that several priory buildings were retained as part of this settlement, and were still standing in the mid-17th century, including part of the church, albeit in a 'very ruinous' state, the Prior's Lodging, the Monks' Hall (refectory), at least five cells, as well as boundary walls enclosing and within the former monastery (Cloake 1990, 60–4). Most of the extant cells probably dated to Mary's reign. The survey also mentions 'a great cistern of stone placed within said wall of Shene', probably a survival from the monastery, which supplied water through small lead pipes to the tenements of West Sheen. The cistern itself was supplied via a lead pipe from a conduit head on Richmond Green. Most of the buildings described in the survey had gone by 1661, and the remaining boundary walls were swept away with the rest of West Sheen in 1769–71 by King George III.

The King's Observatory was built in 1768–9, and in 1842 it was taken over by the British Association for the Advancement of Science. From then until 1980 the Observatory was further developed for the purposes of scientific research and meteorological observation, successively under the direction of the Royal Society (from 1871), the National Physical Laboratory (from 1900) and the Meteorological Office (from 1910) (Cloake 1996, 180–3). The surrounding area of the Old Deer Park was chiefly used as pasture until it was leased by the [now Royal] Mid-Surrey Golf Club in 1892 (Cloake 1996, 173, 176).

PREVIOUS ARCHAEOLOGICAL DISCOVERIES RELATING TO SHENE CHARTERHOUSE

Discoveries 1862–1929

During the late 19th and early 20th centuries remains of the priory were occasionally discovered, by either chance or archaeological fieldwork. Regrettably, there are no known primary records of the investigations during this period, but useful snippets may be gleaned from correspondence, newspaper articles, local histories and other secondary sources.

The first known excavation on the site of the priory was undertaken by Richard Crisp, a local historian, in the winter of 1862–3 after a structure with an arched roof, probably a drain, was exposed by subsidence. The location of the structure was not recorded, but it was described (Crisp 1866, 122–4) as 'a strongly built brick erection 14 feet in length, 3 feet

2 inches in width and 6 feet high, slightly on the curve.' The structure was made of 'wide and thin' bricks similar to those of Richmond Palace suggesting either a late medieval or Tudor date.

In 1893 the remains of walls were allegedly discovered to the south of the then much smaller Observatory complex, in what was later the 'paddock' of the Royal Mid-Surrey Golf Club course. At that time, the complex comprised the Observatory building adjoined to the west by a 2-acre (0.8ha) garden (acquired in 1854), which did not extend as far south as the current boundary (Ordnance Survey 1st edn 25-inches to the mile map, 1868). The walls were apparently found and planned by a local firm of builders, Jarman's, undertaking work at the Observatory. It is not clear what work the builders were engaged upon in this area. The plan is now lost, but parts were copied by local historian Margaret Aldred, and her copy then redrawn in the mid-1950s by an artist for a newspaper article (Anon 1956). In a preceding article Aldred described the remains as comprising underground 'cells' with pointed brick doorways and rounded arches, two tiled floors and wall foundations of 2-inch thick bricks, including three parallel foundations extending south from the perimeter of the Observatory site (Aldred 1955). The approximate positions of some of these structures, including the 'cells' (probably latrine pits) and two of the parallel wall foundations, are shown more clearly on an OS 6-inch map of 1930–48 and record card dated 19 April 1963. Geophysical survey data and the results of recent excavations now suggest that the two wall foundations are actually about 7.5m further west than shown on the OS map. One was for the boundary wall between the east range of the Great Cloister and the 10-acre (4ha) garden that occupied most of the eastern half of the precinct (known as the Great Frayles at least from 1540) (Gater 1998, fig 7, feature 9). The other apparently corresponds to the outer wall of the east cloister. The positions of the tile floors are only very roughly shown in the newspaper plan, but were probably located on the site of the priory garth and therefore arguably belonged to post-Dissolution buildings.

In the mid-1920s an area of 'intricately patterned' stone mosaic floor measuring about 12 ft (3.66m) x 10 ft (3.05m) was found under the fourteenth fairway of the golf course and was identified as part of the monastery by Dr William Tapp, FSA, a member of the golf club (Anon 1955). This may have been part of the floor of the church, the conjectured site of which crosses part of the fairway to the south-west of the site (Cloake 1990, 52; Aldred's (1956) reconstructed plan of the charterhouse incorrectly positions the fourteenth fairway to the south-east of the King's Observatory and wrongly identifies the location of the 'patterned stone' as the south-east corner of the Great Frayles). Certainly, the church would be a likely place to find such elaborate flooring.

Possibly prompted by this discovery Dr Tapp sought permission in 1927 to excavate a trench along the west side of the site 'to discover whether any remains of Sheen Priory were to be found in the Kew Observatory ground'. He proposed that the trench would run close to the perimeter fence north from the south-west corner of the site until the old boundary wall (of the priory) was discovered (Whipple 1927). The excavation began on 18 October 1927 and exposed 'the foundations of a considerable building […] as well as an underground chamber' (Whipple 1928). These remains correspond to 'brick rubble foundations' and an 'arched brick cellar' on the western edge of the site indicated on the map on the OS record card (above). They are identified on the card as 'possible remains of the priory […] uncovered *c* 1920 by a Richmond archaeological group'. More foundations were also apparently found in ground leased by the golf club, just outside the 'paddock' on the south side of the site (Whipple 1928). Any primary records of these investigations are now missing, as is the 'broken crockery' recovered from the site, which was reported as having 'been preserved' (Whipple 1928). None are held by the Museum of London Archaeological Archive, the Society of Antiquaries, Richmond Local Studies or the North Kingston Centre Local History Room. Nor is there any mention of the excavation in the catalogue of the Kew Observatory papers (part of the Royal Greenwich Observatory Archives) held by Cambridge University Library.

The Greater London HER (ref. MLO19137) incorrectly states that finds from the 1920s excavation are with Kingston Museum (Emma Rummins, Kingston Museum, pers comm).

In 1927 Nathanial Lloyd, author of *A history of English brickwork*, undertook an investigation of the Observatory vaults, and found evidence for the reuse of brick probably robbed from the priory. He observed that most bricks were of 18th century type 'except a few (chiefly used at low level) which look like medieval bricks re-used' (TNA: Meteorological Office file BJ1/334 – Archaeology 1927). Many years earlier Robert Scott FRS also noted that 'the central part of the building stands upon vaulting constructed of bricks differing in character from modern 'stock' bricks, being soft, red, thinner and narrower'. He remarked that 'similar bricks are to be found in the walls of Richmond Palace and such have been mainly used in the construction of the basement of the Observatory, up to the stone course' (Scott 1885).

In 1929 about a hundred fragments of building stone were found under the turf of the golf course, although exactly where was not recorded (Anon 1955; Finny 1930). Initially they were left in the open 'arranged around a grass plot in the centre of the gravel path' that led to the club house and golf course. Subsequently, eighteen were kept in the Richmond Public Library before being sent to St Hugh's Charterhouse at Parkminster in Sussex. One of these was sent on to a new charterhouse in Vermont, USA, and another was returned to Richmond for display in the museum (Cloake 1990, 52–3; Museum of Richmond acc no. LDMRD 0020 98 stone from Shene Charterhouse).

1983–1997

The first modern archaeological investigation of the site was a magnetometer and resistivity survey carried out by the Ancient Monuments Laboratory (DoE) in 1983 in the south-west corner of the Observatory enclosure (David 1983). The results were hard to interpret, for although high resistance anomalies appeared to indicate possible linear and rectangular features no clear pattern emerged, owing to the patchy survival of wall foundations and the presence of post-Dissolution rubble-filled garden features, which resulted in a confusing palimpsest.

Aerial photographs (and more recently satellite imagery) indicate the presence of linear features crossing the site and the surrounding golf course, which during dry weather are visible in the closely mown grass of the area as either parch-marks or darker lines of more verdant growth. In 1993 RCHME transcribed most of these features onto a 1:5000 scale plan (fig 7; RCHME 1993). Many undoubtedly correspond to topographical features shown on 18th century maps, but the rectangular enclosure of the priory precinct (including the northern boundary) is also clearly delineated, as is the line of the eastern boundary of the cloister enclosure, which can be seen running south from the site across the thirteenth fairway of the golf course (this north–south feature was not transcribed by RCHME). These features stand out particularly well on an aerial photograph taken on 9 September 1929 (Cloake 1990, 49, fig 26).

Another geophysical survey was undertaken on the golf course immediately to the south and west of the site in 1997 (Gater 1998). This recorded anomalies that almost certainly represent part of the northern cloister walk and an adjacent cell (3), as well as the eastern side of the east range. Others might represent later monastic cells built during the brief restoration of the priory in Queen Mary's reign, and other priory buildings.

Evidence for the priory and its setting

NATURAL LANDSCAPE

Shene Charterhouse was situated in a flat, low-lying area near the Surrey bank of the river Thames. The drift geology of the area comprises sand and gravel of the Kempton Park

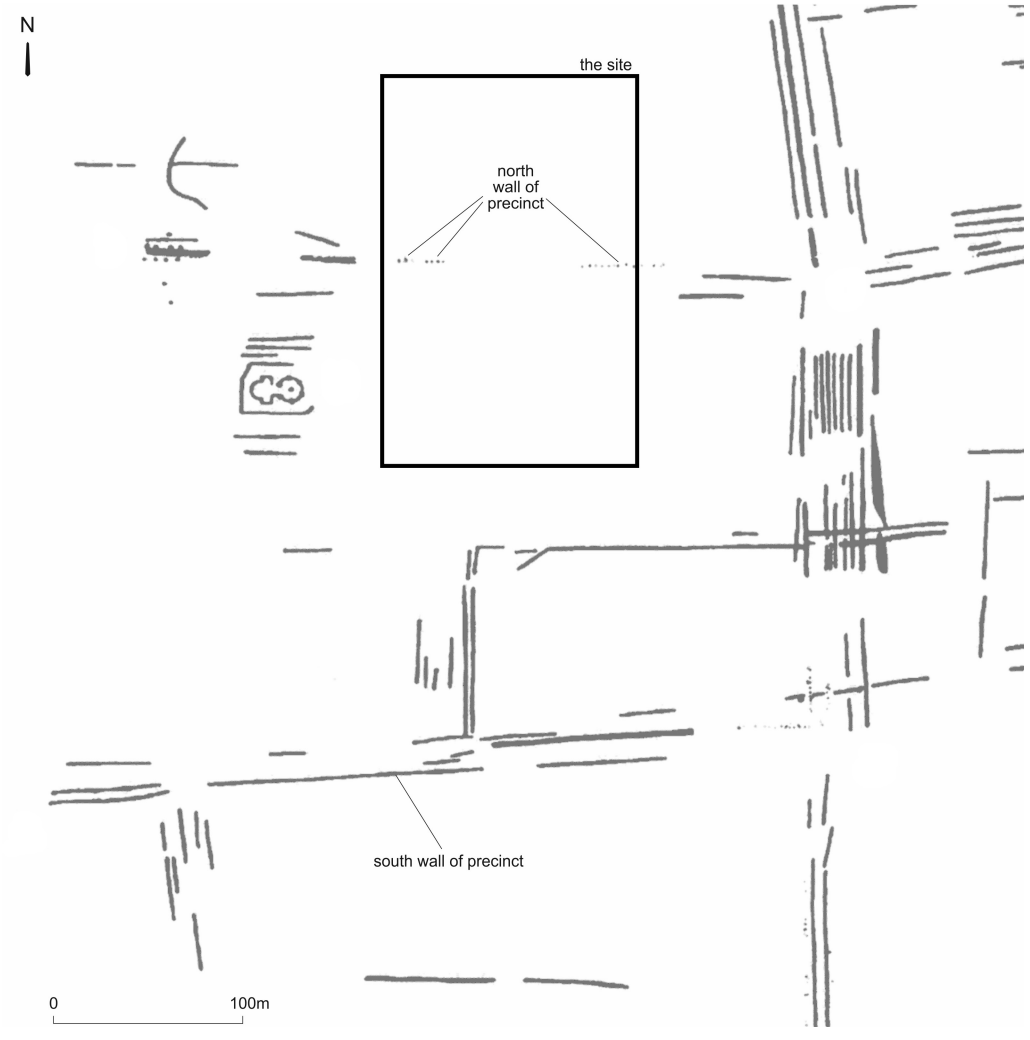

Fig 7 Shene Charterhouse. Archaeological features plotted from aerial photographs (RCHME 1993)

terrace (BGS 1981), capped by brown alluvial sandy/silty clay, the surface of which was found in the excavation areas at *c* 4.5–5m OD.

At the time of the recent investigations the ground surface in the observatory enclosure lay at *c* 4–5.6m OD (excluding artificial mounds) and mainly comprised a thin covering of turf. Landscaping has since changed the topography of the site: the ground level has been slightly raised on the site of the cloister and cells, while a lake has been created to the east in the area where trench 7 was excavated.

Today the locality is poorly drained and prone to inundation. It is likely that local flooding would also have been a problem at the time of the priory – although the precinct walls may have afforded the monastery some protection. Nevertheless, proximity to the river had advantages. There can be little doubt that building materials (and probably other goods) were shipped along the river to the priory, as they were on occasion to Syon Abbey (Dunning 1981, 17, 22).

Initially, the priory was granted leave by Henry V to pipe water from a spring called 'Hillesdenwell'. However, by 1466 this supply had become insufficient and a licence was

granted to the Carthusian community to make an underground conduit from another spring known as 'Welwey' or 'Pickwelleswell' (*VCH* 1905, 91).

NATURE OF THE ARCHAEOLOGICAL EVIDENCE

The physical evidence for the priory chiefly comprised fragmentary remains of wall foundations and their robber trenches. Foundations were mostly made of thin (44–52mm thick) orange-red bricks without frogs, bonded with buff sandy lime mortar. No late medieval ground-level surfaces survived, although a few fragments of residual building material provide some information about the floors and superstructure of the priory.

Post-Dissolution activity was mainly represented by numerous planting pits and beds associated with the gardens of West Sheen and 19th/20th century drains, soakaways and services (not illustrated).

NORTH WALL OF THE PRIORY PRECINCT

Very little of the north wall of the precinct survived, although a small area of its foundation, [347], was found *in situ* in trench 20 (fig 8). The masonry comprised two courses of brick bonded with mortar, and may have escaped robbing because it was slightly deeper than the rest of the wall foundation. Its construction trench, [356] (not illustrated), was filled with clay containing numerous large fragments of Tudor brick.

The original line of the wall was delineated by a robber trench, [120, 194, 346], exposed in trenches 4, 8 and 20 (fig 8). Its course is also sometimes visible from the air as a discontinuous dark line in the turf of the golf course, as can be seen on the aerial photograph of 1929 (Cloake 1990, fig 26, points B–D). The flat base of the robber trench was generally between 0.80m and 1.00m wide, indicating the approximate width of the foundation (fig 9).

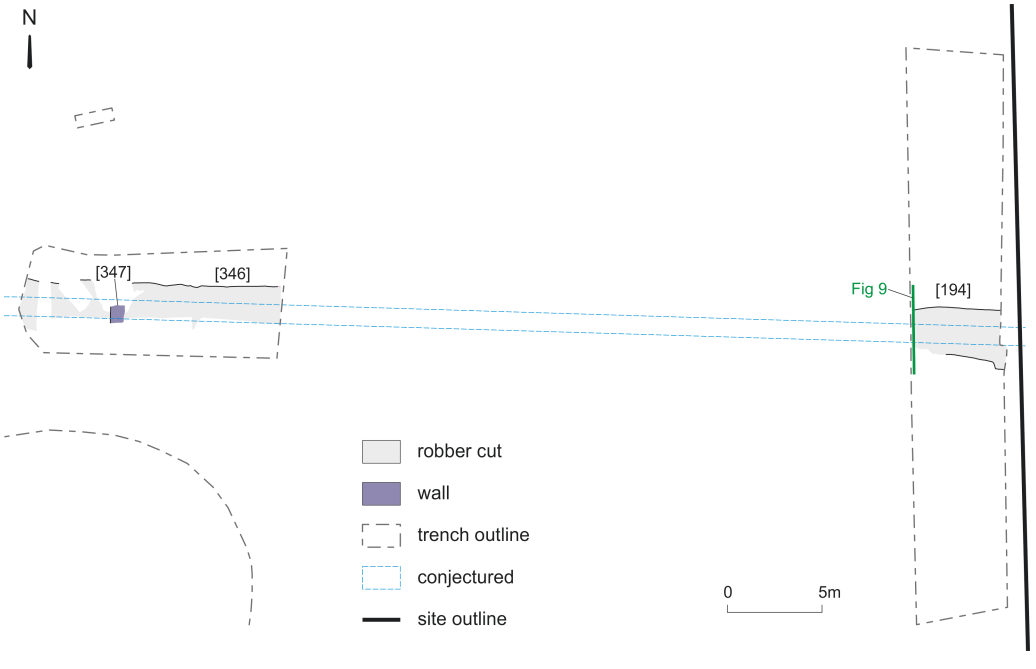

Fig 8 Shene Charterhouse. Archaeological features marking the line of the north wall of the priory precinct. Scale 1:400.

Fig 9 Shene Charterhouse. Robber trench for north wall of the priory precinct, looking west. Photograph by Robert Cowie.

In trench 4 a posthole, [124] (fig 10), about 1m south of the wall line, may have been for scaffolding erected during the construction of the wall. It survived to a depth of 0.16m and contained small fragments of brick and peg tile, but no closely datable artefacts.

THE GREAT CLOISTER

Evidence for two parallel walls of the northern walk of the Great Cloister was found in trenches 3 and 11–13 (figs 10 and 11). The inner wall of the cloister, which also formed the south side of cell 1, was represented by foundations and robber trenches. Foundations [64–65] mostly consisted of a loose tumble of brick rubble on a bed of mortar. The rubble was capped in places with a thin layer of mortar containing small to large fragments of crushed brick. Foundation [67], at the intersection with the eastern wall of cell 1, was more solidly built and comprised bonded brickwork laid in courses. Further east, in trenches 11 and 12, the line of the inner cloister wall was marked by a robber trench, [325, 328, 330].

Separate sections of the outer wall of the cloister were represented by foundations of brickwork laid in courses and bonded with mortar [83, 85, 155]. These, and the outline of robber pit [150], indicated that small rectangular buttresses extended out into the cloister garth from the south side of the wall at regular intervals of about 2.7m. Gaps between the buttressed sections of wall may have marked 2.5m-wide entranceways onto the cloister garth. The east side of foundation [85] was fully exposed revealing a 0.75m-deep stepped footing of thirteen courses. Elsewhere, the approximate line of the outer wall was indicated by robber cuts [72, 152, 178].

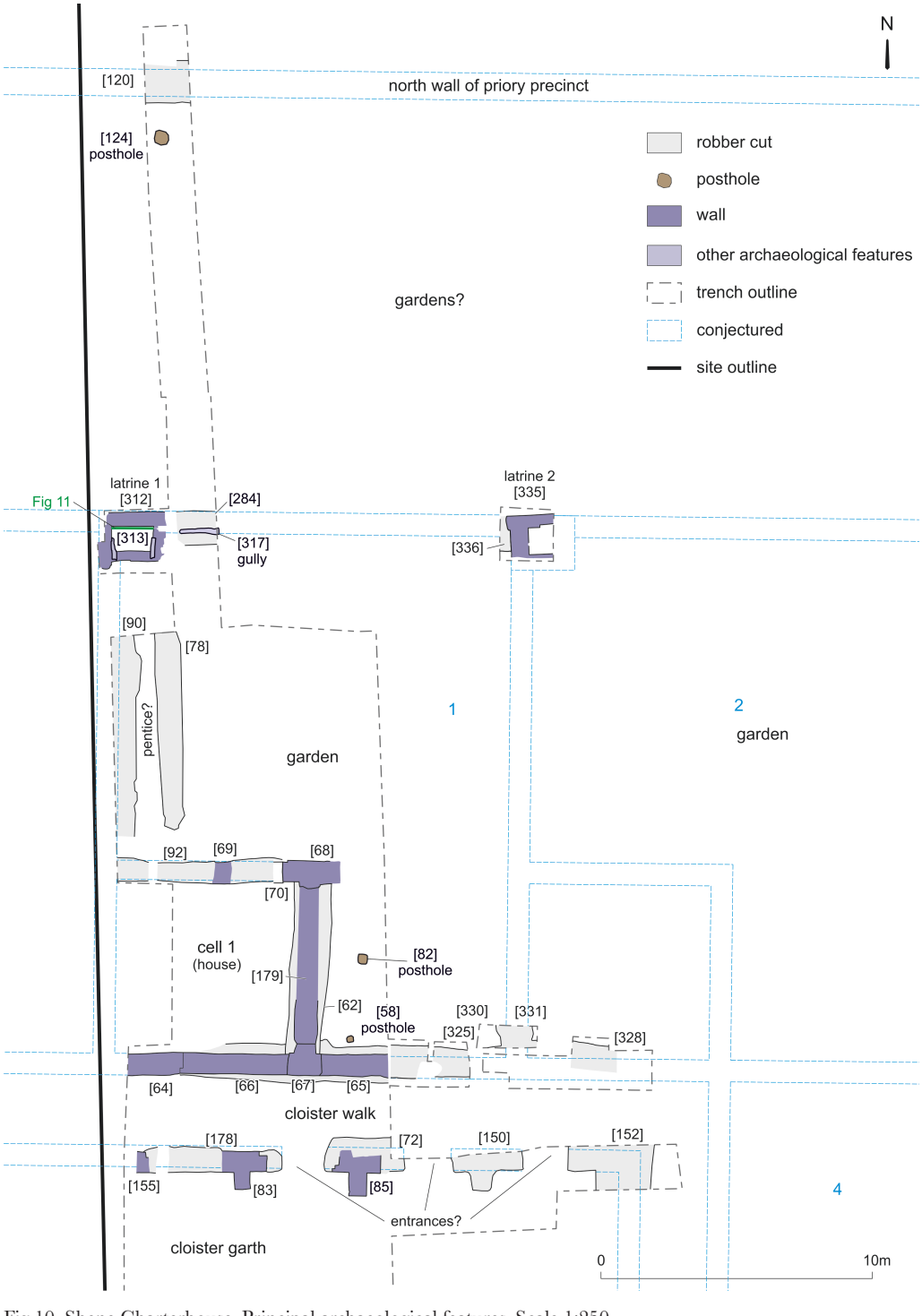

Fig 10 Shene Charterhouse. Principal archaeological features. Scale 1:250.

Bricks from foundations [64] and [65] of the inner wall of the cloister, and foundation [85] of the outer cloister wall, may have come from the same brickyard, and probably date to the early to mid-15th century. This would accord with the historical evidence, which suggests these structures are likely to have been built shortly after 1457 at the latest, but possibly decades earlier (Cloake 1990, 10).

CLOISTER GARTH

For English Carthusians the cloister garth was the customary place of burial for choir monks and lay brethren (Coppack & Aston 2002, 65), and was also a place where water pipes and drains were often laid. Trench 3, primarily excavated to look for such features, extended across what had been the north-eastern corner of the cloister garth. Most of this area was excavated down to undisturbed natural deposits, but no graves or other monastic features were found.

CELL 1

The remains of cell 1 lay on the north side of the cloister walk and in the south-west corner of its garden (fig 11). Its eastern wall was represented by a robber trench, [62], and a wall foundation of brick rubble and mortar, [179]. The remains of its northern wall comprised foundations of coursed brickwork, [68] and [69], and loose brick rubble, [70]. The bricks in these footings were mostly half and three-quarter bats, apparently identical to those in the cloister foundations. The east side of foundation [68] was exposed to its full depth of 0.62m (ten courses), and was found to have a stepped footing. Elsewhere the north wall was delineated by a robber trench, [92].

Fig 11 Shene Charterhouse. North cloister and cell 1, looking west. Photograph by Robert Cowie.

Two postholes, [58] and [82], to the east of the cell, may have been for scaffolding erected during either the construction or demolition of the building. The northern posthole contained a post pad made of peg tile in fabric 2586 dated to *c* 1480–1700.

GARDEN AND POSSIBLE PASSAGE/GALLERY ASSOCIATED WITH CELL 1

The cell garden measured about 19m north–south x 15m east–west (fig 10). Its western and eastern boundaries were marked by robber trenches [90] and [331], which were respectively up to 0.45m and 0.43m deep. The north wall of the garden may have been built as a free-standing structure within a broad but poorly defined construction trench, [307] (not illustrated), which was about 2.25m wide. Successive layers of gravel and sand, with a combined thickness of *c* 80mm had been spread across the base of the trench. These fills were cut by the robber trench for the northern wall of the cell, [284]. The trench was 0.42m deep and up to 1.30m wide. Its base was flat apart from a narrow gully, [317], which ran roughly along its long axis and was up to 0.13m deep. The gully was close to latrine 1 and might once have held a water pipe. If so, the north wall of the garden would have been located either above or immediately next to the pipe.

A robber trench, [78], near to and parallel with the western boundary of the garden, may have marked the east side of a passage or gallery leading from the monk's house to the latrine. It was only 0.26m deep, which suggests that it may have removed a relatively insubstantial wall foundation – probably for a pentice built against the western wall of the garden.

LATRINE 1

A latrine pit associated with cell 1, [312], was located in the north-west corner of the garden (fig 10, fig 12). This was the 'underground chamber' excavated by Dr Tapp in 1927 and reburied in about 1950. The earthen backfill, which contained objects of 20th century date, was dug to a depth of 0.90m, but owing to time constraints it was not fully excavated.

The latrine walls were made of bricks similar to those used in the cloister and cell 1, although slightly smaller in size and therefore perhaps of a different date. They were laid in courses comprising an irregular combination of headers and stretchers. The north wall was slightly wider than the others and had an arched opening 0.52m wide (fig 13), the northern end of which had been blocked by an iron sheet, probably in the mid-20th century.

Pitched brickwork, [313], keyed into the south wall and the southern halves of the east and west walls appeared to be the remains of a vaulted structure. The vault would have covered the southern half of the latrine pit and presumably supported the floor of the overlying room and the south side (front) of a toilet bench. The space beneath the bench above the northern half of the latrine pit would have been left open hence the absence of any vaulted structure in this location.

CELL 2

Trench 13 revealed a robber trench, [331], which marked the western wall of another cell (2) (fig 10). This would have extended north to join the west side of latrine 2 (below).

LATRINE 2

A latrine pit, [335], to the east of latrine pit 1, would have served neighbouring cell 2 (fig 10). Its northern and western walls were only partly exposed to depths of 0.25m and 0.43m respectively (fig 14). They varied slightly in thickness from those of latrine 1, but were made of the same type of bricks and mortar laid in similar fashion.

Fig 12 Shene Charterhouse. Latrine 1, looking north (0.5m scale). Photograph by Robert Cowie.

Evidence for the demolition of priory buildings

DEMOLITION OF THE NORTH WALL OF THE PRIORY PRECINCT

Most of the precinct wall was probably pulled down in the late 1760s. Its demolition was apparently very thorough so that even its foundations were almost completely removed. The resulting robber trench was exposed in trenches 4, 8 and 20, where it survived to depths of between 0.40m and 0.50m. In trenches 8 and 20 the sides of the robber trench were stepped (fig 9), presumably to aid levering up the masonry.

In trench 4 the robber trench was mainly filled with rubble, and produced plain yellow and brown glazed Tudor Low Countries floor tiles, thin late 15th to mid-16th century bricks, peg roofing tiles, a ridge tile, a small fragment of Reigate stone moulding, possible ashlar, and what may be fine-grained sandstone roofing. It also yielded three fragments of degraded medieval or early post-medieval greenish-brown 'forest' or 'potash' window glass, a fragment of thin lead sheet <8>, two fragments of lead came <9> and 16th or 17th century iron nails. Most of these materials, including the window glass and lead came, were probably originally used in priory buildings. One shaped brick with a bevelled cut edge has white paint or whitewash applied above a 2–3mm thick mortar layer attached to one face. This brick has mortar on the broken edge so the application of whitewash or paint may relate to a later reuse.

In trench 8 a secondary rubble fill, [193], of the robber trench, [194], yielded decorated and plain ashlar blocks cut from Reigate stone. These almost certainly derive from the priory as must do the associated bricks, and probably most of the peg roofing tiles, the possible stone roofing and paving slabs cut from fine-grained sandstone.

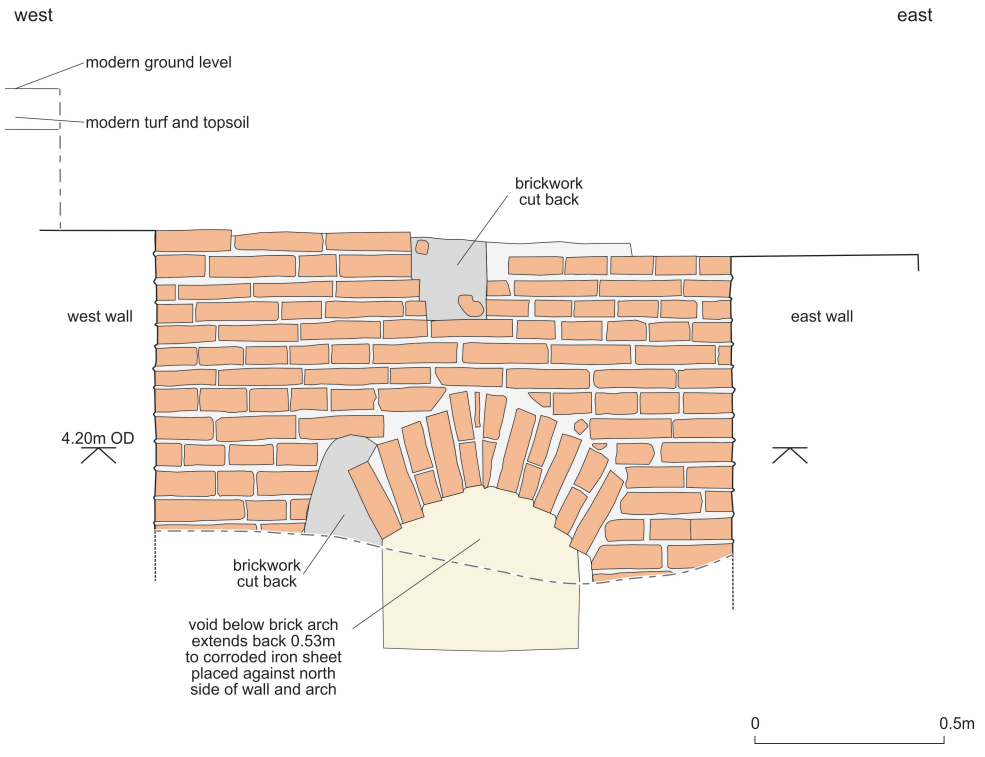

Fig 13 Shene Charterhouse. South-facing elevation of latrine 1. Scale 1:20.

Other finds from the robber trench accord with demolition in the late 1760s. A dozen potsherds (197g) from four vessels recovered from the robber trench in trench 4 appear to be residual material from either the priory and/or West Sheen, as they comprise London-area early post-medieval redware (PMRE) and the slipped and glazed equivalents PMSRG (with green glaze) and PMSRY (with yellow glaze), dated to *c* 1480–1600. The finds from the robber trench in trench 8, however, are rather later, comprising pottery (nineteen sherds, sixteen ENV [ie, estimated number of vessels], 585g) dating to about 1720–30, four clay pipe bowls (forms AO10, AO25) dating to *c* 1700–70, and two sherds from a glass wine bottle of early cylindrical form dating to after 1750.

DEMOLITION OF THE NORTH CLOISTER

The north cloister was probably demolished together with most of the Great Cloister and adjacent cells shortly after the suppression of the priory in 1539. Initially, the cloister may have been simply levelled leaving its foundations substantially intact. Indeed, it appears that some footings were not cleared until much later as some post-Dissolution planting pits and beds were cut by robber trenches. Similarly, at Syon Park the creation of successive post-Dissolution gardens resulted in episodic removal of burials and the robbing and clearing of abbey foundations and brick-lined tombs long after the overlying buildings had been demolished (Cowie 2011b, 52–61; in prep).

The relatively late clearance of some foundations is also indicated by finds evidence. For example, robber trench [60] for the inner wall of the cloister yielded a clay pipe bowl (form AO10) dated to *c* 1640–50, and three potsherds (18g) from a PMSRY dish, a Surrey/Hampshire Border redware (RBOR) mug and a tin-glazed ware dish, which together date the fill to *c* 1570–1650.

Fig 14 Shene Charterhouse. Latrine 2, looking south (0.5m scale). Photograph by Robert Cowie.

Robber trenches [72] and [178] removed segments of foundations of the outer wall of the cloister. Robber trench [72] produced various fragments of building material including blocks cut from Reigate and Caen stone, Tudor brick of similar type to that used in the cloister and cell 1, a slightly thicker (55–56mm) brick of probably 16th century date, and a peg roofing tile with two round nail holes near the top edge.

DEMOLITION OF CELL 1 AND ITS GARDEN WALL

The robber trench of the east wall, [62], clipped post-Dissolution plant beds, again suggesting the clearance of foundations long after the wall itself had been razed to the ground. It contained two sherds from jars in PMRE dated to *c* 1480–1600 and a clay tobacco pipe stem. The robber trench of north wall, [92], produced a slightly worn plain brown glazed Low Countries floor tile, also dated to *c* 1480–1600, with a distorted round nail/peg hole in the top corner.

Robber trench [90] had removed the dividing wall between cells 1 and 3 (see fig 10). It produced a small residual sherd of medieval Surrey/Hampshire Coarse Border ware (CBW).

The robber trench for the north wall of the cell garden, [284], yielded three sherds (3 ENV, 93g) that broadly date to *c* 1512–1650, but which could be of 16th century date. One is of uncertain date, another is of PMSRY, while the third is from a polychrome tin-glazed ware vase, possibly from the Low Countries (DTGW; <33> fig 15), and perhaps used in the priory.

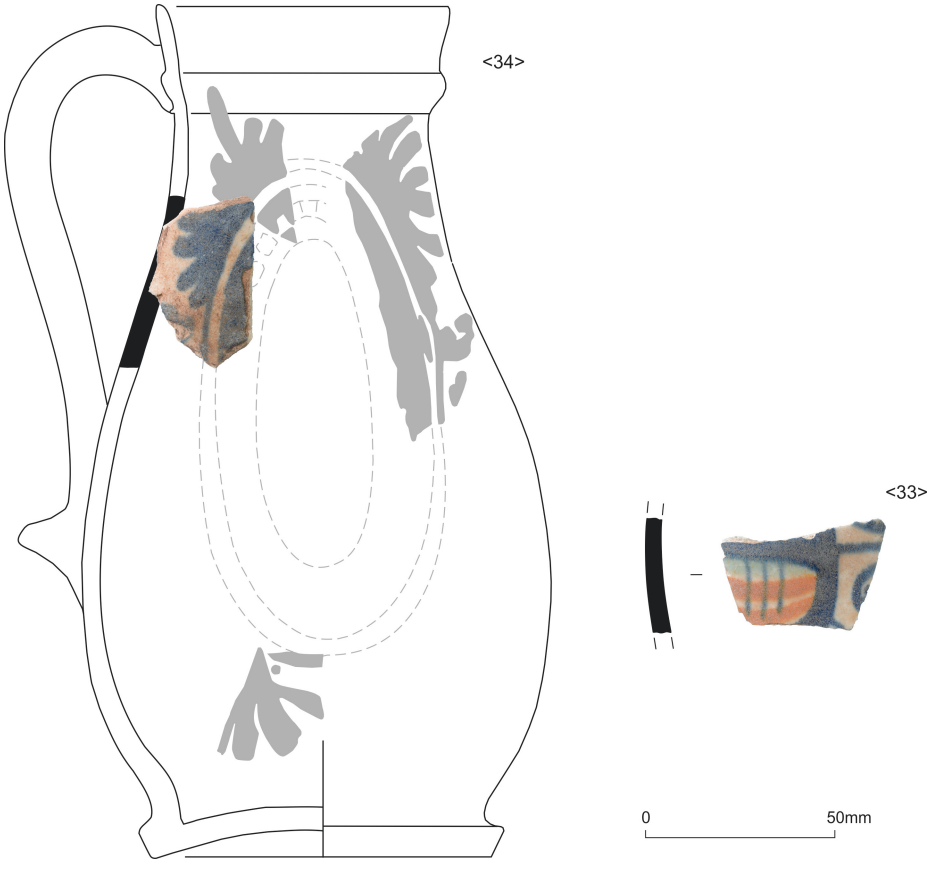

Fig 15 Shene Charterhouse. Sherds of ?Dutch tin-glazed ware (DTGW) with polychrome decoration (<33>, <34>). Scale 1:2. Photographs by Maggie Cox; drawings by Hannah Faux.

PLANT BEDS

Four plant beds in trench 9 were probably associated with the post-Dissolution settlement of West Sheen, but contained medieval or early post-medieval pottery that could relate to the use of the priory. Three produced single sherds, one of CBW, one from a DTGW jug with the edge of a medallion design in blue (<34>, fig 15), and one of PMRE dating to *c* 1480–1600. The fourth bed yielded four sherds (four ENV, 144g) – one from a mature Valencian lusterware (VALM) bowl, the others of PMRE and Raeren stoneware (RAER).

Ceramic building material, by Ian Betts

FLOOR TILES

Fabrics 1678, 1813, 2191, 2504, 2850, 3075

Plain and decorated floor tiles have been found on most excavated monastic sites in the London area. Floor tiles were undoubtedly used at Shene Charterhouse, but no decorated examples were recovered – almost certainly because the priory was founded just after production of decorated Penn tiles ceased at the end of the 14th century. From the 15th century the demand for floor tiles was almost entirely met by the importation of plain glazed examples from the Low Countries.

A few thinner priory floor tiles may be of medieval date, but most seem to be of larger type dating from the late 15th century to the Dissolution. These include four unstratified Tudor examples. Some floor tiles could have been reused in Sheen Place after the Dissolution.

Most of the priory tiles are Low Countries imports, and almost certainly derive from two separate production centres. One made tiles with white speckled calcareous clays (fabrics 1678, 2191, 2504), the other used various silty clays (fabrics 2850, 3075). The latter are exclusively of Tudor date. Tiles in both groups would have been laid in the chequerboard pattern with the plain yellow glazed examples alternating with tiles of dark green/brown colour. A small fragment of dark green glazed floor tile made with sandy clay (fabric 1813) may also be from the Low Countries.

STOVE TILE

Fabric 2310

A corner of a glazed Tudor stove tile (fig 16, <29>) was an unstratified find that might derive from either Shene Charterhouse or Sheen Place. Its front surface has a cream slip covered by a mottled green and greenish-yellow lead glaze. The tile is not of the best quality as the glaze does not cover the entire upper slipped surface. There are scored decorative lines in the tile border, but no other decoration survives.

The stove tile is in PMSRG dated to *c* 1480–1620 (Lyn Blackmore, pers comm). It was probably made at a pottery based in Woolwich in east London. If so, the tile is of particular significance as there is no other evidence for the manufacture of stove tiles at Woolwich (Blockley 1978, 44–83).

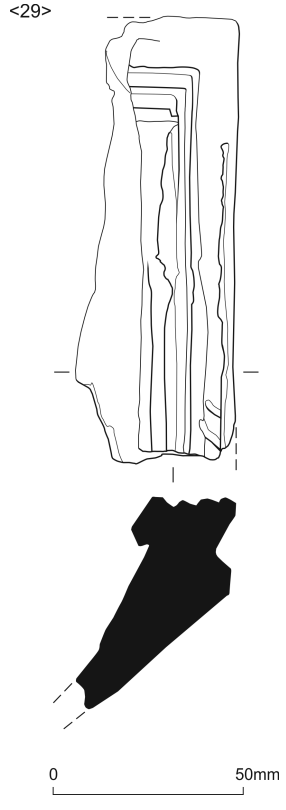

Fig 16 Shene Charterhouse. Corner of Tudor stove tile <29>. Scale 1:2. Drawing by Hannah Faux.

The introduction of internal free-standing wood-burning ceramic stoves allowed a more efficient way of heating the interior of domestic London buildings in the late 15th–16th centuries (Gaimster & Nenk 1997, 179). Tiled stoves continued to be installed in the early 17th century, although less frequently, but had fallen out of fashion by the mid-17th century. They were replaced by cheaper coal-fired fireplaces and hearths (Gaimster *et al* 1990, 16). Tiled stoves were expensive and largely restricted to royal palaces and the homes of the aristocracy, but they were also used in monasteries, such as St Mary Graces, East Smithfield (Blackmore *et al* 2011, 134).

ROOFING TILE

Peg roofing tile

All the peg roofing recovered would appear to be unglazed tiles of Tudor and later date. These are all London-made products with two nail/peg holes situated near the top edge. There are nail/peg holes of round, square and diamond type, the latter being square holes deliberately set at a 45° angle to the tile sides. Peg roofing tiles probably covered at least some of the priory buildings, as well as various post-Dissolution buildings on or near the site.

Ridge tile

A number of curved ridge tiles were recovered from the site. These would have run along the top of peg tile roofs.

BRICK

Fabrics 3046, 3065, 3206, 3210, 3260, 3324, 3327

Many of the bricks recovered from the site almost certainly derive from Shene Charterhouse, which would indicate an early to middle 15th century date. Most are 45–51mm thick and made with fine sandy clay, with a scatter of small white calcium carbonate inclusions. The bricks are in a number of fabrics (types 3206, 3210, 3324, 3327), but these probably represent slight changes in the clay used at the same brickyard or brickmaking area. A solitary brick in coarse sandy fabric 3260, from a hollow next to the robber trench of the northern precinct wall in trench 8, may belong to the same group.

The bricks in this group were used in the construction of the outer wall, [85], and inner wall, [64] and [65], of the northern cloister, and the north wall of cell 1, [68]. These are 223–224mm long, 104–110mm broad and 44–51mm thick.

Similar bricks, some with slightly less quartz, were used in the walls of latrine pits 1 and 2. These are, however, of slightly smaller length (211–212mm) and breadth (99–101mm) but are of similar thickness (46–52mm). Other bricks were found in later rubble and ditch fills.

Fine sandy bricks characterised by white calcium carbonate inclusions are rarely found in the City of London, suggesting the priory bricks were probably made either in the Richmond area or at a brickyard situated somewhere west of London. Many bricks have either one or two sunken margins in their top outer edge. These occurred when clay was pulled up around the brick edges when the moulding frame was removed. These upturned areas were pushed back down with the base of the moulding frame resulting in narrow sunken margins around the top edge.

Two bricks have a ‘glazed’ grey coloured header end, suggesting they could have been used in diaper work. This is when grey bricks were used to form a decorative pattern in red brick walls. Hieronymus Grimm’s watercolour of the gateway of Sheen shows diaper patterns on sections of the southern precinct wall flanking the main gate (fig 6). Similarly, the precinct walls of Bermondsey Abbey are known to have had various decorative diaper patterns on their external face (Smith 2011, 199–201).

Other bricks were made from coarser sandy clay lacking calcium carbonate inclusions (fabric 3060). Some may be contemporary with the group discussed above as they are of similar thickness (46–49mm). These are associated with the north wall of the precinct as they come from its construction cut [356] (not illustrated) in trench 20 and a fill of its robber trench in trench 8. They are *c* 203–221mm long and 98–108mm broad. Similar sandy bricks, also in fabric 3065, have been found on other sites in or near London, including at Hobby Stables, Greenwich, where they were found associated with a building of 1532–3 (Betts 2007).

The other bricks in fabric 3060, and slightly less sandy type 3046, are slightly thicker (52–60mm) suggesting a 16th or possibly early 17th century date. These bricks could have been used in either the priory or post-Dissolution Sheen Place.

Stone building material, by Ian Betts

MOULDINGS AND ASHLAR

There are two fragments of stone moulding, too small to determine where they were originally located in the building, and at least three ashlar blocks cut from Reigate stone. Reigate stone, mainly quarried from underground mines in the parishes of Merstham and Chaldon to the east of Reigate (Tatton-Brown 2001, 195), was widely used in London in major masonry structures such as royal palaces, monastic buildings and parish churches. Shene Charterhouse was almost certainly constructed in part of Reigate stone. Caen stone from Normandy was also employed for decorative and plain ashlar work on some London monastic sites, and was certainly used in the construction of Shene Charterhouse (Allen Brown *et al* 1963, 265). One piece, probably part of an ashlar block, was recovered from a robber cut of the outer cloister wall in trench 3.

POSSIBLE ROOFING AND PAVING

There are a few pieces of brown fine-grained sandstone, some fragments of which were thin enough (13–14mm) to have been used for roofing. Sandstone roofing is not common in London, but there is evidence for its use at Bermondsey Abbey (Betts 2011b, 202). Some thicker pieces could have been used, or reused, as paving. Similar stone may have been used as paving at Black Friars (Betts 2017, 243).

Pottery, by Lyn Blackmore

MEDIEVAL WARES

Six residual sherds (113g) probably derive from the priory. The most problematic is a large sherd from a greyware vessel that appears to be handmade; the clay matrix is very fine, but contains large angular inclusions of grog, chalk or limestone. The fabric appears too highly fired to be Iron Age or Anglo-Saxon, and this is probably a medieval ware from Surrey or from a source to the west, perhaps Buckinghamshire. The other sherds are probably all of 15th century date, comprising two sherds of coarse Surrey/Hampshire Border ware (CBW), one of Cheam ware (CHEA), one of Langerwehe stoneware (LANG) and one part of a Valencian lusterware (VALM) bowl. Despite being well to the west of the City, these pottery fabrics are typical of those found across the capital. The imports reflect the wealth and connections of the charterhouse.

POST-MEDIEVAL WARES

Only those sherds of 16th century date possibly associated with the priory are considered here. The earliest is a sherd of early Surrey/Hampshire Border ware (EBORD) drinking jug, dated to *c* 1480–1550, found in a plant bed [140]. London-area early post-medieval redware

(PMRE; date range 1480–1600) totals 21 sherds (643 g) deriving from two bowls, two bowls/dishes, two cauldron/pipkins, a chafing dish, ten jars and a jug. In addition there are ten sherds (four ENV, 143 g) of slipped post-medieval redware (PMSRG/Y). Also of earlier 16th century date is a sherd of Raeren stoneware (RAER) from the Rhineland, and possibly also two sherds of probably Dutch tin-glazed ware (DTGW/SNTG), one from a jug or vase with polychrome decoration (<33>, fig 15), the other with the edge of a ladder medallion in blue and possibly from a taller pear-shaped jug (<34>, fig 15; Blackmore 2010, fig 14). Some of these wares may have been used in the priory, but all could date to about the time of the Dissolution or soon after.

Discussion and conclusions

CONSTRUCTION AND BUILDING MATERIALS

It is not clear how long Shene Charterhouse took to build, although Cloake argued that the priory was virtually complete in 1417, and dated his successive reconstructions of the entire ground plan of the monastery to *c* 1420 (Cloake 1990, 10). This was perhaps an overly optimistic view, for both at Shene and neighbouring Syon Abbey building work continued long after the religious houses were ready for occupation. The Bridgettine community moved to its new abbey (at what is now Syon Park) in 1431, only five years after the first stone was laid, but construction continued there until well into the following century (see Dunning 1981). Likewise, at Shene it seems that from 1457 there may have been further work on cells, and later still a chapel with three altars was added to the church (Cloake 1990, 10). All the cells around the Great Cloister, including cells 1 and 2, were apparently built by the time of Worcester's visit in the reign of Edward IV. From this limited evidence we might conclude that these buildings were completed soon after 1457 at the latest, but possibly much earlier in the 15th century.

Considerable quantities of red brick were used both at Shene and Syon Abbey. The archaeological evidence from Shene indicates brick was used in latrine pits and the foundations of the cloister and cells, while the 1650 Survey states that the 'walls in and about' the monastery were of brick, as were the surviving cells, although some of the latter were almost certainly Marian.

In 1417 bricklayers or 'tilers' were brought over from 'Holland' to work at Shene. In this respect both houses appear to be early examples of the extensive use of brick, a material that was increasingly used in London's monastic buildings from the mid to late 15th century, for example at the priory and hospital of St John of Jerusalem, Clerkenwell (Smith 2004, 327), the abbey of St Saviour Bermondsey (Betts 2011a, 213), the London Charterhouse (Barber & Thomas 2002, 52) and Holywell Priory (Betts 2011b, 151).

At Shene stone was probably used in brick buildings as dressing around gateways, doors and windows, as well as more extensively in communal buildings such as the church and chapter house. Indeed, the 1650 Survey describes both the former Monks' Hall and the 'great cistern' as being of stone.

The excavations yielded only a few fragments of stone, including three or four pieces of ashlar and two small fragments of unidentifiable moulding, all from demolition deposits. The scarcity of stone suggests the predominance of brick as a building material, at least in the cloister and cells. However, stone may be under-represented in the archaeological record as most usable stone may have been salvaged during demolition for sale and reuse. The hundred or so fragments discovered on the golf course in 1929 represent the largest find of building stone from the site to date. These may have been discarded as too awkwardly shaped for reuse, for apparently most pieces were from 'various arches and vaults', although at least three were of window tracery. Although their precise find-spot is not known the fragments were probably discovered on or near the site of the church or other communal buildings, to the south-west of the Observatory site.

NORTH WALL OF THE PRIORY PRECINCT

Excavation showed that the precinct wall was chiefly delineated by a robber trench, a feature occasionally visible from the air as a discontinuous linear feature crossing the site and the adjacent golf course. The small surviving section of foundation in trench 20 suggests that the wall was of brick, which accords with Grimm's watercolour showing the gateway on the south side of the precinct flanked by brickwork walls with diamond-shaped diaper patterns. This also tallies with the description in the 1650 Survey of brick walls 'about' the monastery – almost certainly a reference to the precinct boundary.

The wide base of the robber trench suggests that the wall had a broad foundation, perhaps up to 1m wide in places and probably stepped like the footings for the northern cloister walk and cell 1. This, together with possible evidence for the use of scaffolding in the construction of the wall, suggests that the precinct boundary was probably of considerable height, as shown by Grimm (fig 6).

THE GREAT CLOISTER AND CLOISTER GARTH

The northern cloister walk at Shene was about 3m wide – broadly comparable to those of Syon Abbey, where the nun's cloister walks were of similar width and those of the brothers were at least 2.7m wide (Cowie in prep). The Shene example was, however, surprisingly wide, for generally Carthusian cloister walks were narrower than the multi-purpose cloisters of other orders, and served merely as communicating passages connecting cells to the church and other parts of the monastery. Other recorded examples in England ranged in width from 1.22m at Beauvale to one of 2.5m on the west side of the Great Cloister at Axholme (Coppack & Aston 2002, 97–8). The surprising width of the cloister walk at Shene Charterhouse might reflect the relative wealth of the monastery and its status as a royal foundation.

According to the revised ground plan (fig 18) the cloister garth would have covered an area of nearly 1000m^2, although this may be an underestimate for there is reason to believe that Great Cloister may well have been larger (see below). Just over 2.6% of the area currently proposed for the garth was investigated in trench 3, which revealed no features associated with the monastery. The trench, however, was located near the north-east corner of the garth – arguably an unlikely location for burials or other monastic features. A cemetery would be more probably located in a part of the garth closer to the church, and might therefore lie to the south-west of the Observatory site, perhaps under the fourteenth fairway. At the London Charterhouse the location of such a cemetery is suggested by five undated graves in the south-west corner of the garth, just north of the church (Barber & Thomas 2002, fig 39).

CELLS AND GARDENS

Generally, in medieval England Carthusian cells were of a standard layout, although minor variations have been recorded between cells within individual monasteries and between those of different charterhouses (see Coppack & Aston 2002, 75, fig 37 for comparative plans). Most (possibly all) cells were two-storey houses. Typically, the ground-floor comprised a narrow entry passage or lobby with two or three rooms behind serving as a living room, study and bedroom, while the upper floor may have been a workroom and/or store. Usually two galleries extended out from the cell, one running along the cloister wall served as a private cloister, the other extended along the garden wall providing a covered walk to the latrine.

The reconstructed ground plan of cell 1 at Shene Charterhouse suggests that internally it would have measured about 6.4m^2, making the house comparable in size to the cells of London Charterhouse and Mount Grace, and perhaps slightly more spacious than those at Beauvale and Coventry. During the excavations the interior of the cell was carefully examined for evidence of internal features, but none survived. However, robber trench [78],

in the cell garden, might mark the line of a wall for a pentice connecting the monk's house to the latrine.

The description of the 'Anchorite' cells surviving at the time of the 1650 Survey confirms that they were two-storey buildings, and provides other useful information about their layout. Two of the cells, valued at only £4 each, may have been relatively unaltered. Both had '2 rooms below and 2 above, a long shed and a little garden' Another cell, valued at £5 was similarly described, but had '2 long sheds and a little outhouse used for a stable or cow house'. The long sheds may have been galleries that once served as private cloisters or the passages that formerly connected the monks' houses to their latrines.

Together cell 1 and its associated garden and latrine covered a rectangular plot of about 19m north–south x 15m east–west. As cells within individual charterhouses are typically of the same size these dimensions were critical in reconstructing the plan in figure 18.

LATRINES

The latrines of Shene Charterhouse were apparently a little larger than those of other Carthusian monasteries. Latrine pit 1 had external dimensions of about 2.20 x 1.80m and internal dimensions of 1.54 x 0.90m. While these might not indicate exactly the size of the overlying room they suggest a generous, but not excessively large, toilet. The extra width may have been for urinals (Coppack & Aston 2002, 82) and, in the absence of drains, possibly to accommodate a larger latrine pit.

When possible, Carthusians favoured drains to carry effluent from their latrines, as at Mount Grace and London Charterhouse (Saxby *et al* in prep). However, this may not have been considered practical at Shene, where because of its low-lying Thames-side location there was the inherent risk of drains backing up when the river was in flood. Similarly, Dutch Carthusians opted for pit latrines because of the high water table. In the Netherlands the Carthusian brick-built latrine pits were circular in plan and fed by adjoining square shafts. The pits were domed and extended under the back walls of the cell gardens, so that they could be cleaned out from outside through a hole in the vault (Glyn Coppack, pers comm 3 November 2015). Likewise, at Shene each latrine pit in the north range would have been periodically shovelled or raked out through an arch on its northern (outer) side from just outside the back wall of the cell garden. The same would probably apply to latrines in the east and west ranges, and possibly those in the south range as well – although here access for emptying latrine pits may have been more restricted.

RECONSTRUCTING THE PRIORY GROUND PLAN

Most charterhouses of medieval England left some visible remains in the form of standing buildings or earthworks, allowing at least partial reconstruction of their ground plans (the plans are reproduced in Coppack & Aston 2002). These include London Charterhouse (Wardle 1886; RCHME 1925, 21–31; Barber & Thomas 2002, figs 18, 36, 39, 55 and 56; for additions from recent excavations see Daykin with Henderson 2017; Saxby *et al* in prep) and Mount Grace in Yorkshire – the latter being the most complete and accessible example (Coppack 1996, 2–3; Coppack & Aston 2002, 42, fig 17). The two exceptions are the charterhouses of Hull and Shene, although conjectured ground plans of the latter have been reconstructed mainly from cartographic and documentary evidence, as well as aerial photography and occasional chance observations.

Glover's map of 1635 is particularly informative for it gives an impressionistic three-dimensional view of West Sheen and the retained priory buildings. Although it lacks the precision of later maps, it conveys a good enough outline of the hamlet for specific buildings to be identified with varying degrees of confidence. Crucially, for the purposes of map regression, some structures can also be identified on more accurate 18th century maps and plans (John Rocque 1746; 1754; and on two plans of West Sheen estate of 1749–50 and

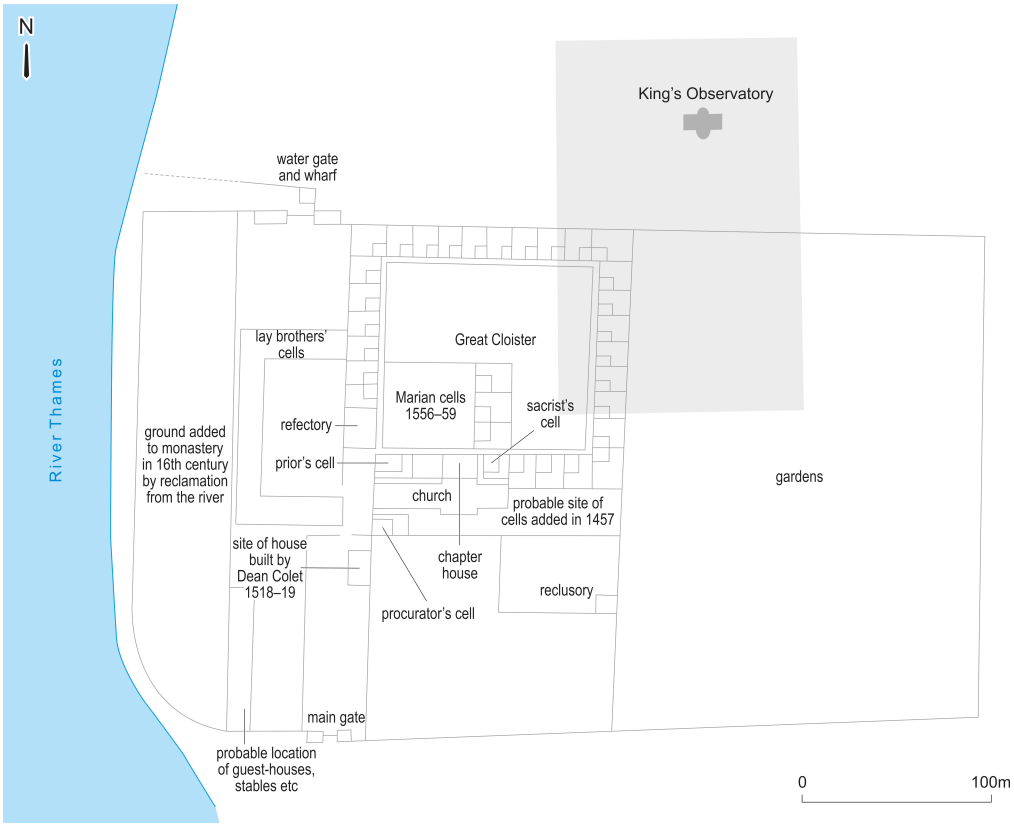

Fig 17 Shene Charterhouse. Plan *c* 1420 by John Cloake (from Cloake 1995, fig 22).

1759: Cloake 1990, 25; TNA: CRES 2/1241). Wyngaerde's drawings of Richmond Palace in 1561–2 provide the earliest views of Shene, which is shown only very sketchily as a cluster of buildings with pitched roofs and what appears to be a three-storey gatehouse with a large arched entrance, although Cloake suggests this may have been part of the church (Cloake 1990, 41).

The first conjectured plan of the priory, by Margaret Aldred, although largely based on Glover's map, is hopelessly inaccurate, placing the Great Cloister too far west, proposing a massive refectory measuring 132 ft (40.23m) x 24 ft (7.31m), and identifying the church as a building on a north–south alignment to the west of the Great Cloister (Aldred 1956). Cloake considered this building to have been a post-Dissolution stable block and coach-house. Aldred also placed a barn in the Great Frayles against the east wall of the precinct, noting that foundations were visible on an aerial photograph in this location, although this is not indicated by the features transcribed from aerial photographs by RCHME.

John Cloake later made considerable progress in reconstructing the layout of Shene in *c* 1420 and in 1558 (the Marian phase) by detailed analysis of documentary sources and pictorial evidence combined with map regression. The following discussion primarily concerns his plans of the pre-Dissolution (*c* 1420) priory, which he first published in 1977, and slightly revised in 1990. His final version, published in 1995, includes several amendments (fig 17). In general, the layouts of the priory in all three versions are superficially similar. They show the walled area of the priory as roughly rectangular, almost 400m east–west x *c* 250m and 270m north–south at the east and west ends respectively. The enclosed space is

divided unequally into rectangular courts. The principal features include the Great Cloister, surrounded by the monks' cells, the prior's and sacrist's cells, the chapter house, the wash house, and the frater (refectory). The priory church and adjoining chapel are positioned to the south of the cloister, with the lower house (accommodating the lay brothers) to the west.

Cloake's final plan adds a water gate and wharf by the north-west corner of the priory, indicates the probable location of guest-houses and stables in the south-west corner of the precinct, labels as 'gardens' the rectangular plot in the eastern half of the precinct (the Great Frayles), and changes the position of the monks' houses relative to their gardens, and the location of the procurator's cell (fig 17). In this plan the church is larger and slightly cruciform and the Great Cloister squarer and more in keeping with Worcester's description. The cells built during the Marian period of occupation are helpfully shown in dotted outline.

REVISING THE PLAN OF THE PRIORY

The discovery of the northern cloister and adjacent cells, during the evaluation in 2011, was unexpected as Cloake's reconstruction placed them further north, with the cell gardens extending up to the north wall of the precinct. This was soon followed by the discovery of the latrines and evidence for the northern extent of the gardens, which stopped about 15m short of the northern boundary of the priory. So, it now appears that there was a 15m-wide plot between the cell gardens of the north range and the north wall of the precinct. There were apparently comparable arrangements at Axholme, Beauvale and Coventry, where similar open spaces may have been used for gardens (Glyn Coppack, pers comm 3 November 2015).

This new information, together with details about the dimensions of buildings and gardens of the north range, allows further refinement of Cloake's plan (fig 18). The cloisters and cells have been moved south. Cell 3 and the adjacent stretch of cloister correspond to high-resistance anomalies recorded during the geophysical survey in the golf course in 1998 (Gater 1998, fig 7, no 7). Robber trench [152] marks the position of the north-east corner of the cloister garth. Most of the east range is reconstructed from geophysical anomalies recorded during the resistivity survey in 1983 (David 1983), which apparently delineate parts of the cloister and possibly monks' cells, and by superimposing standard-sized cells and gardens based on cell 1 and its garden (fig 19). Anomalies suggest that cells 4, 5 and 6 were located in the south-west corner of their respective gardens, confirming Cloake's positioning of these cells in his 1995 plan (the 1990 plan placed the cells in the north-west corner of the gardens).

The line of the boundary wall between the east range of the Great Cloister and the Great Frayles is visible from the air as a linear mark extending at least 113m south from the site boundary. The southern part of the boundary was also recorded in 1998 as a geophysical anomaly (fig 18). Further south, another linear anomaly on the same alignment probably represents a continuation of the boundary with a western return about 157m south of the site (not illustrated).

For the reconstruction presented here the modern interpretation of Worcester's description of the size of the Great Cloister has been taken to define the length of the east range. This may be problematic, however, as it is difficult to see how all 30 cells and their gardens would fit around a cloister of this size, especially as the chapter house, priory prison, wash house and access passages would also need to be accommodated. Either some cells and other elements were located elsewhere, or the cloister was larger, extending further south or west or in both directions, although only the latter would agree with Worcester's square cloister. If the cloister was larger we must question the accuracy of either Worcester's description or our interpretation of it.

In considering this problem Cloake speculated that cell 1 and the adjacent cloister may have been Marian and the original north range was built against the northern perimeter wall as first thought (John Cloake, pers comm, 19 January 2011; at the time of this suggestion the latrines had yet to discovered). However, this solution can be ruled out, since no evidence was

Fig 18 Shene Charterhouse. Conjectured layout of part of the Great Cloister. Scale 1:1000.

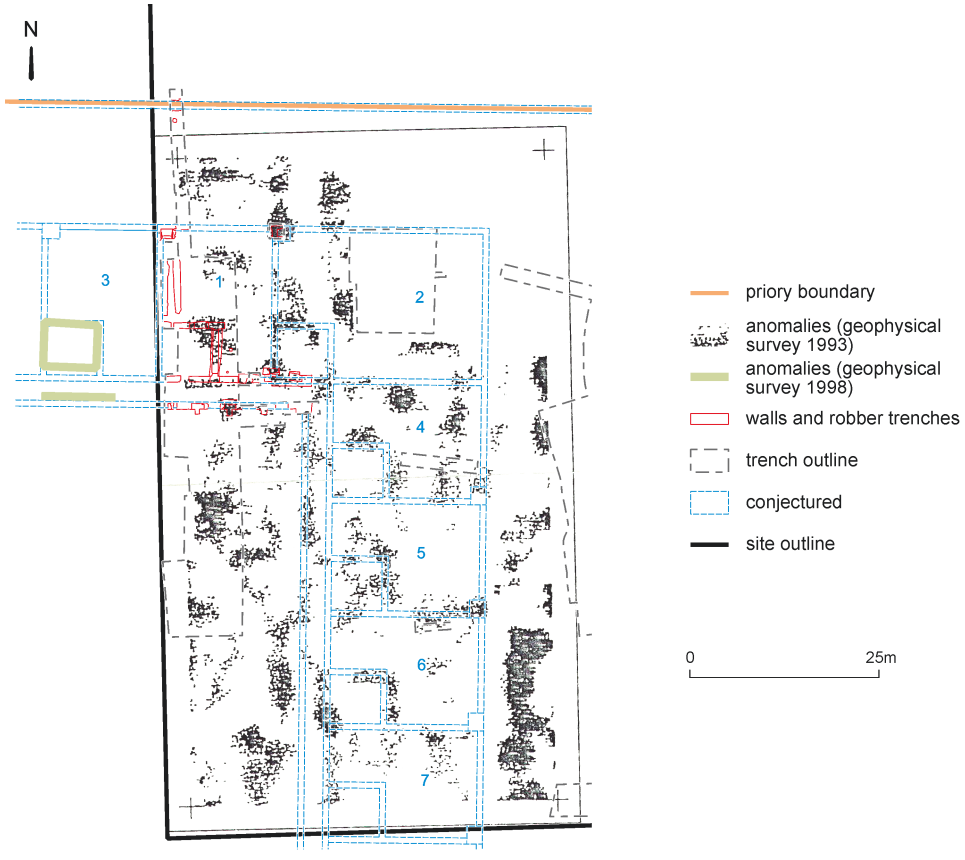

Fig 19 Shene Charterhouse. Conjectured layout of cloister superimposed on plot showing high-resistance anomalies recorded during the geophysical survey in the south-west corner of the King's Observatory enclosure. Scale 1:1000.

discovered for an earlier cloister to the north of the one found in trench 3. Furthermore, no cells are shown in this location on Moses Glover's map of 1635, but buildings convincingly identified by Cloake (in his earlier reconstructions) as cells are shown to the south-west (beyond what are now the grounds of the King's Observatory). The map suggests that the Marian cells, as Cloake originally surmised, were built around a relatively small cloister near the church. The smaller Carthusian community of Mary's reign would, after all, have required only a few cells.

Future work

There is much work still to do, as there are many aspects of English charterhouses (including Shene) that we know little about. These include cemeteries and the demographic information of the communities that they hold, the development of cells and gardens, and the nature and functioning of the water supply and toilets (Coppack & Aston 2002, 148–50).

At Shene we are also still grappling with fundamental questions about the ground plan of the monastery. Cloake's pioneering research on Shene Charterhouse produced useful reconstructions of the priory, which suggest in broad outline its layout and provide models to test and refine. The results of the recent archaeological investigations have begun this process, for we now have a reasonably good idea of the standard dimensions of the monks'

cells and gardens and have located with greater precision the site of the north range and cloister walk as well as the northern end of the east range. These are further south than hitherto thought, and therefore necessitate a southward shift of other major elements of the priory shown on earlier reconstructions. The scale of this shift is at present unclear, because there is still uncertainty about the size of the Great Cloister (see above). To answer this question would probably require further excavation. Using the current data much could be achieved by the excavation of a few targeted test pits, especially to the south and south-west of the observatory.

There may be patchy survival of floors and ground-level deposits associated with the charterhouse, as suggested by the stone mosaic floor discovered under the fourteenth fairway in the 1920s. The results from the King's Observatory were less promising. Here there was no possibility of studying the internal layout of the cells and gardens. Nevertheless, there is apparently considerable potential on the site for the survival of robber trenches and foundations marking the position of principal walls of buildings and boundaries. During the excavations these were often encountered at depths of between 0.20m and 0.42m, although occasionally features were exposed at depths of up to 0.60m. Given that some foundations lie less than 0.30m below modern ground level it is likely that, as in the past, monastic remains will occasionally be exposed through erosion and subsidence. Every effort should be made to accurately record the nature and location of such finds.

The assemblage of building material from the King's Observatory excavations was disappointing. By contrast, the stone fragments found in 1929 may provide valuable information about the architecture of the charterhouse, for carving could be clearly distinguished on some 60 pieces (Cloake 1990, 52–3; Finny 1930). One sketch and four photographs of selected pieces have been published, and some fragments have been measured and photographed, but as yet the group has not been fully assessed by a specialist and published.

It may also be helpful to produce a digital plan of the entire site of the monastic precinct, incorporating features recorded by aerial photography, geophysical survey and excavation, and including, if feasible, information from historic maps and plans. Cloake has left us a comprehensive synthesis of the historical evidence, which should certainly be revisited as and when further archaeological evidence comes to light.

Epilogue

Shene Charterhouse and its neighbour Syon Abbey were special, and today their sites are recognised as forming part of a nationally important historic landscape. They represent a late, albeit isolated, flowering of medieval monasticism, after which no other religious houses were founded in England until the late 15th century (Knowles & Hadcock 1971, 44). Forty years after Shene's final closure, when most of Syon Abbey had long gone (Cowie in prep) and few buildings of the charterhouse remained, these two great houses were immortalised by Shakespeare (*Henry V*, Act 4, Scene 1) as 'two chantries where the sad and solemn priests still sing'.

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Finally, the late Dr John Cloake, FSA, Richmond's foremost historian, deserves special mention for his outstanding contribution to the study of Shene Charterhouse and to this project in particular.

BIBLIOGRAPHY

Manuscript sources

TNA: The National Archives (formerly PRO: Public Record Office, London)
BJ 1/334 Meteorological Office file – Archaeology 1927
CRES 2/1241 Agreement between Sir John Buckworth and John Jeffreys to exchange holdings – 1702
E 317/Surrey 53 Parliamentary Survey of Sheen Monastery, January 1649/50
Syon: Archives of the Duke of Northumberland at Syon House
B.XIII.1b Moses Glover's Map of Isleworth Hundred, 1635

The following important documents were seen by the late John Cloake during his research; however, the author is unable to determine where they are currently held:
Whipple, F J W, 1927 Letter from F J W Whipple, Superintendent of Kew Observatory, to Director of Meteorological Office (DMO), 14 July 1927
Whipple, F J W, 1928 Letter from F J W Whipple, Superintendent of Kew Observatory, to Director of Meteorological Office (DMO), 8 February 1928

Published and secondary sources

Aldred, M G, 1955 The unsolved mystery of the old priory, *Richmond and Twickenham Times*, 24 December
——, 1956 One of Richmond's treasures: let us save it, *Richmond and Twickenham Times*, 18 August
Allen Brown, R, Colvin, H M, & Taylor, A J, 1963 *The history of the King's Works: Vol 1, the Middle Ages*, London: HMSO
Anon 1955 Historic 'finds' on the golf links, *Richmond and Twickenham Times*, 31 December
Anon 1956 Forgotten discoveries, *Richmond and Twickenham Times*, 7 January
Aston, M, 1993 *Monasteries*, London: Batsford
Atkinson, D R, & Oswald, A, 1969 London clay tobacco pipes, *J Brit Archaeol Ass,* **32,** 171–227
Barber, B, & Thomas, C, 2002 *The London Charterhouse*, Museum of London Archaeology Service Monogr Ser, **10**
BGS 1981 British Geological Survey, 1981, South London Sheet 270, solid and drift edition, Southampton: Ordnance Survey
Betts, I M, 2007 Building materials, Anchor Iron Wharf, Lassell Street, Greenwich (LAS01), unpubl MOLA rep
——, 2011a The building materials, in T Dyson, M Samuel, A Steele & S M Wright, *The Cluniac priory and abbey of St Saviour Bermondsey, Surrey*, Museum of London Archaeology Monogr Ser, **50,** 201–14
——, 2011b Ceramic and other building material, in R Bull, S Davis, H Lewis & C Phillpotts, *Holywell Priory and the development of Shoreditch to* c *1600*, Museum of London Archaeology Monogr Ser, **53,** 149–54
——, 2017 Floor tiles and building materials from London friaries, in N Holder, *The friaries of medieval London*, Woodbridge: The Boydell Press, 227–44

Blackmore, L, 2010 The maiolica jug and associated finds, in T Brigham, T Dyson & B Watson, Saxo-Norman, medieval and post-medieval development at Regis House, London, EC4, *Trans London Middlesex Archaeol Soc,* **61,** 121–3

Blackmore, L, Gaimster, D, & Goffin, R, with Cowell, M, & Freestone, I, 2011 Continental stove-tile fragments, in I Grainger & C Phillpotts, *The Cisterian abbey of St Mary Graces, East Smithfield, London*, Museum of London Archaeology Monogr Ser, **44,** 134–8

Blockley, K, 1978 The pottery report, in S Pryor & K Blockley, A 17th-century kiln site at Woolwich, *Post-Medieval Archaeol,* **12.1,** 30–85

Cloake, J, 1977 The Charterhouse of Sheen, *SyAC,* **71,** 145–98

——, 1990 *Richmond's great monastery: the charterhouse of Jesus of Bethlehem of Shene*, Richmond: Richmond Local Hist Soc Pap, **6**

——, 1995 *Palaces and parks of Richmond and Kew: 1, the palaces of Shene and Richmond*, Chichester: Phillimore

——, 1996 *Palaces and parks of Richmond and Kew: 2, Richmond Lodge and the Kew Palaces*, Chichester: Phillimore

——, 2009 The King's Observatory, Old Deer Park, Richmond: historical report, unpubl rep (https://kingsobservatory.co.uk/history (accessed 2 July 2018))

Cloake, J, & Cowie, R, 2010 The King's Observatory, Old Deer Park, Richmond, London TW9, London Borough of Richmond upon Thames: archaeological desk-based assessment, unpubl MOLA rep

Coppack, G, 1996 *Mount Grace Priory,* 2 edn, London: English Heritage

Coppack, G, & Aston, M, 2002 *Christ's poor men: the Carthusians in England*, Stroud: Tempus

Cowie, R, 2011a King's Observatory, Old Deer Park, London TW9, London Borough of Richmond upon Thames: evaluation report, unpubl MOLA rep

——, 2011b Syon House, Syon Park, Brentford, TW8, London Borough of Hounslow: Birkbeck University of London training excavation 2011, unpubl MOLA rep

——, 2012 King's Observatory, Old Deer Park, Richmond, London TW9, London Borough of Richmond upon Thames: report on evaluation (Phase 2), unpubl MOLA rep

——, in prep Syon Abbey: archaeological investigations at Syon Park, Brentford, 1997–2018, for *Trans London Middlesex Archaeol Soc*

Crisp, R, 1866 *Richmond and its inhabitants, from olden time, with memoirs and notes*, London

David, A, 1983 Geophysical report on survey of part of Kew Observatory compound, unpubl Ancient Monuments Laboratory rep G22/83 – Historic England AML reports old series rep no. 4159 (http://research.historicengland.org.uk/Report.aspx?i=2680&ru=%2fResults.aspx%3fp%3d1%26n%3d10%26t%3dKew%26ns%3d1 (accessed 2 July 2018))

Daykin, A, with Henderson, M, 2017 The London Charterhouse and the Glasshouse Yard General Baptist burial ground: excavations at Therese House, London EC1A, *London Archaeol,* **14.12,** 311–16

Dunning, R W, 1981 The building of Syon Abbey, *Trans Ancient Monuments Soc,* **25,** 16–26

Gater, J A, 1998 Sheen Charterhouse: Report on geophysical survey, survey no. 97/92, unpubl Geophysical Surveys of Bradford rep

Gaimster, D, & Nenk, B, 1997 English households in transition *c* 1450–1550: the ceramic evidence, in D Gaimster & P Stamper (eds), *The age of transition; the archaeology of English culture 1400–1600*, Soc Medieval Archaeol Monogr, **15**, Oxbow Monogr, **98,** 171–96

Gaimster, D, Goffin, R, & Blackmore, L, 1990 The continental stove-tile fragments from St Mary Graces, London, in their British and European context, *Post-Medieval Archaeol,* **24,** 1–49

Knowles, D, & Grimes, W F, 1954 *Charterhouse: the medieval foundation in the light of recent discoveries*, London: Longmans, Green and Co

Knowles, D, & Hadcock, R N, 1971 *Medieval religious houses: England and Wales*, 2 edn, Harlow: Longman

Marsh, B, & Biggs, M, 2011 The King's Observatory, Kew: geophysical survey report, job no. 2842, unpubl Stratascan rep

NHLE: National Heritage List for England, 2015 (Entry Number 1412036) The Shene Charterhouse (https://historicengland.org.uk/listing/the-list/list-entry/1412036; accessed 14 September 2017)

Oswald, A, 1975 *Clay pipes for the archaeologist*, BAR Brit Ser, **14**

Pringle, S, with Smith, T P, 2004 Other stone and ceramic building material, in B Sloane & G Malcolm, *Excavations at the Priory of the Order of the Hospital of St John of Jerusalem, Clerkenwell, London*, Museum of London Archaeology Service Monogr Ser, **20,** 32–130

RCHME, 1925 *An inventory of the historical monuments in London: Vol 2, West London*, London: Royal Commission on the Historical Monuments of England

— 1993 Carthusian monasteries project: Sheen, air photographic transcription and analysis, unpubl Royal Commission on the Historical Monuments of England rep (held by Historic England Archive)

St John Hope, W H, 1902 The London Charterhouse and its old water supply, *Archaeologia,* **58**, 293–311

St Lawrence Finny, W E, 1930 Fragments of fifteenth-century masonry from Richmond, *SyAC,* **38,** 105

Saxby, D, with Betts, I M, Egan, G, Grey, T, Keys, L, Pearce, J, Pipe, A, Roberts, K, Smith, T P, in prep Excavation at St Bartholomew's Hospital Medical college, Charterhouse Buildings, Clerkenwell Road and Goswell Road, London EC1, for *Trans London Middlesex Archaeol Soc*

Scott, R H, 1885 History of Kew Observatory, *Proc Roy Soc,* **39,** 37–86

Smith, T P, 2011 The patterning in the brick garden walls, in T Dyson, M Samuel, A Steele & S M Wright, *The Cluniac priory and abbey of St Saviour Bermondsey, Surrey*, Museum of London Archaeology Service Monogr Ser, **50,** 199–200

Stow, J, 1603 *A survey of London*, C L Kingsford (ed), vol 1, 1908 repr 1971, Oxford: University Press

Tatton-Brown, T, 2001 The quarrying and distribution of Reigate Stone in the Middle Ages, *Medieval Archaeol,* **45,** 189–201

Urwin, A C B, 1965 *Twicknam Parke: An outline of the history of Twickenham Park and the St Margarets Estate from Domesday to the present day*, Hounslow

VCH, 1905: *The Victoria history of the county of Surrey*, vol 2, H E Malden (ed), London: Archibald Constable & Co Ltd

Vince, A, & Jenner, A, 1991 The Saxon and early medieval pottery of London, in A Vince (ed), *Aspects of Saxo-Norman London: Vol 2, Finds and environmental evidence,* London Middlesex Archaeol Soc Spec Pap, **12,** 19–119

Wardle, G, 1886 The ancient buildings of the Charterhouse, *Archaeol J,* **43,** 231–42